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- New Independent States Task Force / Energy Efficiency and Market Reform Project
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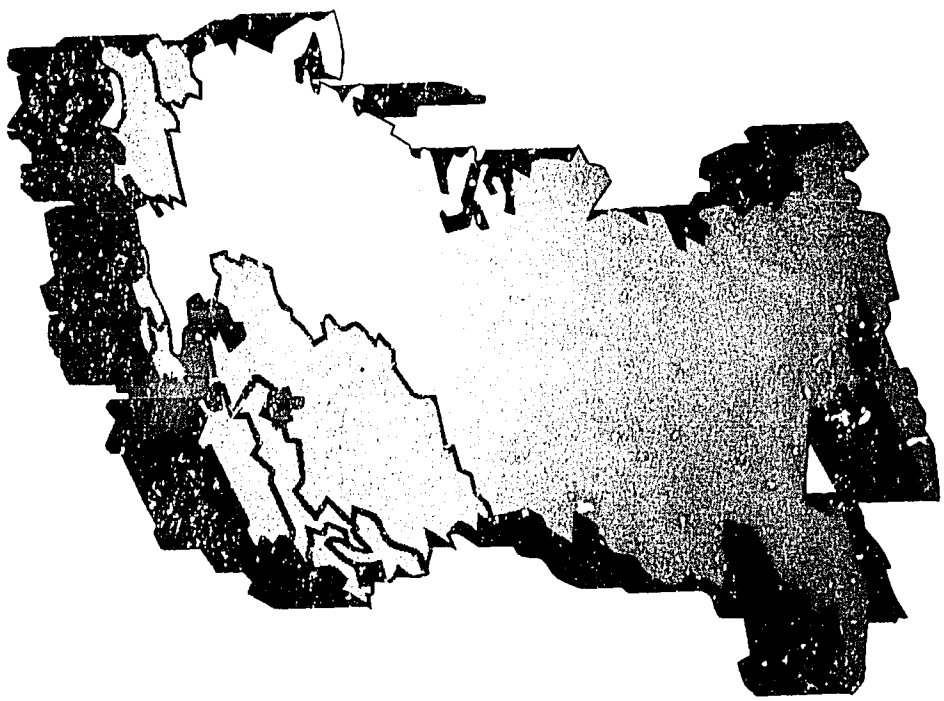

NIS Natural Gas System Rehabilitation

Final Report Addendum ▪ November 1993

Prepared by
Energy Technology Innovation Project
Contract No. DHR-5741-Q-00-1062-00
Delivery Order No. 4
Prime Contractor: Bechtel Corporation

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SECTION 2 APPENDICES

2-A Insertion of Polyethelyene (PE) Pipe

Appendix 2-A

INSERTION OF POLYETHYLENE (PE) PIPE

2-A.1 PREPARATION FOR INSERTION (please refer to Sketch 2-A-1)

Introduction

Plastic pipe can be inserted into existing steel main and services, thereby reducing installation costs considerably. Bell holes approximately 1.5 meters by 1.5 meters in size need to be provided at every service tap. After new services are inserted, the old taps can be cut out and the new main can be inserted through the bell holes. The new services can then be connected to the plastic main. This should be done a block at a time to minimize the service interruption time to the customer. If service connections are farther than 600 m apart, additional bell holes at 600 m intervals will be required.

1. The inside diameter of the casing pipe (the existing steel pipe) must be free of sharp or rough surfaces. Casing pipe must be blown out with air and the ends reamed. Where necessary, the entire length of the casing pipe must be reamed.

2. Protection from sharp edges of casing must be provided for main and service inserts by using cable protectors.

3. A casing diameter at least one pipe size larger than the plastic carrier pipe diameter is adequate for most installations.

2-A.2 DURING INSERTION

1. Plug the end of the plastic main before inserting and provide a guide line if deemed necessary.

2. It is preferable to push plastic pipe through a casing instead of pulling it. It is not to be pulled through a casing pipe with mechanical equipment unless special precautions are taken to eliminate the possibility of overstressing. Constant monitoring of the pulling force or using a pulling head containing a "weak link" are two methods of eliminating the possibility of overstressing.

3. The pipe must be installed so it will be free of tensile loading. Allowance must be made for thermal contraction when plastic pipe is installed on a warm day; otherwise the pipe will be in tension when it cools.

4. Provide slack in all plastic mains before making final tie-ins.

5. Insulated locating wire shall be installed with the plastic pipe and it may be used to provide cathodic protection to isolated steel components within the plastic pipe system. Do not codweld or braze on a casing pipe containing plastic pipe.

6. Split end type casing seals should be installed on all casing ends.

2-A.3 BACKFILLING

1. Backfill must provide firm continuous support under and around the pipe. It must be free of sharp objects, rocks, and large clods. Extra care should be taken to provide proper compaction under pipe and fittings at branch and transition locations to prevent differential settlement. At least 6 inches of select, rock-free soil or sand shall be used for bedding pipe if the trench bottom is not smooth. To allow for backfill settlement at casing pipe gaps and where plastic spans disturbed earth, the pipe should be lifted slightly while the backfill is packed underneath.

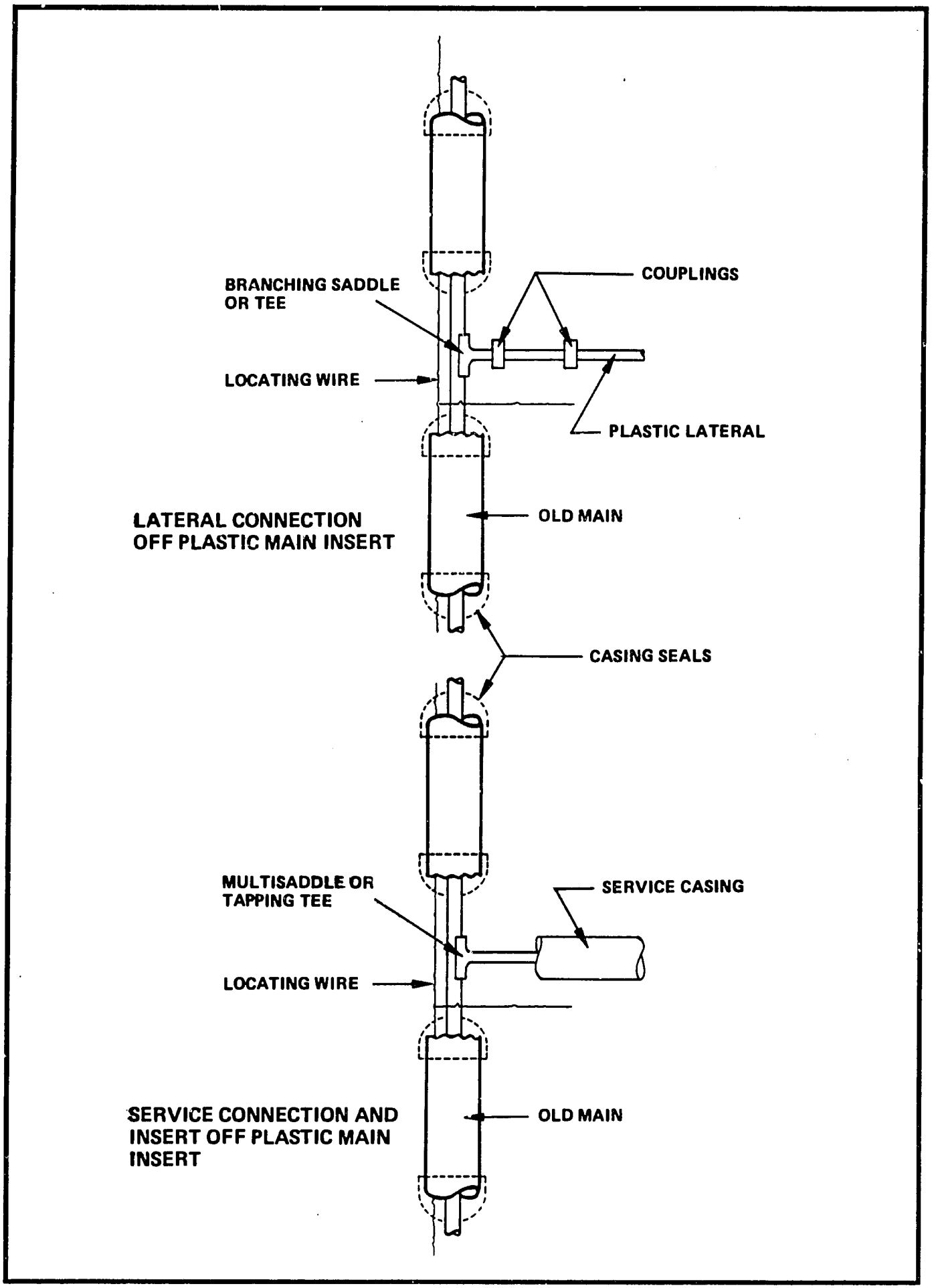
2. Backfill should be tamped at the sides of the plastic pipe, but shall not be tamped over the pipe until a 0.5 meter cover is attained. Backfill shall not be dumped directly on top of plastic pipe service connections or transition fittings. Service connections, bell holes, and points of transition of plastic to steel shall be compacted only by hand tamping.

2-A.4 OPERATION AND MAINTENANCE

1. If casing is damaged (broken, bent or crushed), the plastic carrier pipe must be replaced in the damaged area and air tested.

2. If the casing has been damaged and it appears that there was pulling movement of the pipe or casing where damage could have occurred at locations along the service other than those inspected or repaired, the entire service shall be air tested for 5 minutes. If additional damage is found, rerun service.

3. Whenever a plastic service inserted riser or prefabricated non-corrodible riser may have been subjected to unusually high temperature, such as being exposed to a house fire or meter fire, the plastic insert or the entire riser must be replaced.



INSERTION OF PE PIPE IN EXISTING STEEL PIPES

SKETCH 2A - 1

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
1	GROSS DOMESTIC PRODUCT												
2	Index			100.0	91.0	74.0	63.0	58.0	57.0	60.4	63.9	67.7	71.7
3	Annual Change				-9.00%	-18.68%	-14.86%	-7.94%	-1.72%	5.90%	5.90%	5.90%	5.90%
4													
5	POPULATION												
6	Russia mid-year			148,123,574	148,578,939	148,964,797	149,300,359	149,608,953	149,909,089	150,205,065	150,500,705	150,804,108	151,123,152
7	Russia year start				148,351,257	148,771,868	149,132,578	149,454,656	149,759,021	150,057,077	150,352,885	150,652,407	150,963,630
8	Annual Change					0.28%	0.24%	0.22%	0.20%	0.20%	0.20%	0.20%	0.21%
9	Ryazan – city			522,000	524,000	525,000	526,273	527,409	528,484	529,535	530,579	531,636	532,734
10	Saratov – city			908,000	909,000	907,000	909,199	911,163	913,018	914,835	916,639	918,465	920,362
11	Volgograd – city			1,005,000	1,003,000	1,002,000	1,004,429	1,006,599	1,008,649	1,010,656	1,012,648	1,014,666	1,016,762
12	Voronezh – oblast			2,475,000	2,475,000	2,475,000	2,481,001	2,486,359	2,491,422	2,496,381	2,501,302	2,506,285	2,511,463
13													
14	NATURAL GAS PRICE												
15	Industrial/DH	US$/1000m³				1.10	15.00	24.50	40.00	40.00	40.00	40.00	40.00
16	Change from 1993							63.30%	166.67%	166.67%	166.67%	166.67%	166.67%
17	Annual Change							63.30%	63.30%	0.00%	0.00%	0.00%	0.00%
18	Commercial	US$/1000m³				1.10	15.00	24.50	40.00	58.70	77.40	96.10	114.80
19	Change from 1993							63.30%	166.67%	291.33%	416.00%	540.67%	665.33%
20	Annual Change							63.30%	63.30%	46.75%	31.86%	24.16%	19.46%
21	Residential (Cooking)	US$/1000m³				0.26	5.00	8.97	16.11	40.00	105.00	170.00	235.00
22	Change from 1993							79.48%	222.14%	700.00%	2000.00%	3300.00%	4600.00%
23	Annual Change							79.48%	79.48%	148.34%	162.50%	61.90%	38.24%
24	Resid. (Cook + HW)	US$/1000m³				0.26	5.00	8.13	13.21	40.00	67.50	95.00	122.50
25	Change from 1993							62.56%	164.26%	700.00%	1250.00%	1800.00%	2350.00%
26	Annual Change							62.56%	62.56%	202.73%	68.75%	40.74%	28.95%
27	Resid. (Cook + HW + SH)	US$/1000m³				0.26	5.00	8.13	13.21	40.00	67.50	95.00	122.50
28	Change from 1993							62.56%	164.26%	700.00%	1250.00%	1800.00%	2350.00%
29	Annual Change							62.56%	62.56%	202.73%	68.75%	40.74%	28.95%
30													
31	DISTILLATE FUEL OIL PRICE												
32	Industrial/DH equiv.	US$/1000m³		50.20	50.20	110.43	150.59	200.78	250.98	250.98	250.98	250.98	250.98
33	Change from 1993						36.37%	81.82%	127.28%	127.28%	127.28%	127.28%	127.28%
34	Annual Change						36.37%	33.33%	25.00%	0.00%	0.00%	0.00%	0.00%
35	Commercial equiv.	US$/1000m³		50.20	50.20	110.43	153.59	213.61	297.10	413.21	413.21	413.21	413.21
36	Change from 1993						39.08%	93.44%	169.04%	274.18%	274.18%	274.18%	274.18%
37	Annual Change						39.08%	39.08%	39.08%	39.08%	0.00%	0.00%	0.00%
38	Residential equiv.	US$/1000m³		75.58	75.58	75.58	226.75	302.33	415.71	581.99	581.99	581.99	581.99
39	Change from 1993						200.00%	300.00%	450.00%	670.00%	670.00%	670.00%	670.00%
40	Annual Change						200.00%	33.33%	37.50%	40.00%	0.00%	0.00%	0.00%

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	GROSS DOMESTIC PRODUCT												
2	Index		74.5	77.4	80.4	83.5	86.8	90.2	93.7	97.4	101.2	105.1	109.2
3	Annual Change		3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%
4													
5	POPULATION												
6	Russia mid-year		151,460,347	151,817,479	152,196,495	152,602,523	153,037,887	153,498,108	153,977,658	154,471,669	154,969,921	155,459,573	155,933,015
7	Russia year start		151,291,750	151,638,913	152,006,987	152,399,509	152,820,205	153,267,997	153,737,882	154,224,664	154,720,795	155,214,747	155,696,294
8	Annual Change		0.22%	0.23%	0.24%	0.26%	0.28%	0.29%	0.31%	0.32%	0.32%	0.32%	0.31%
9	Ryazan – city		533,892	535,117	536,416	537,802	539,286	540,666	542,525	544,242	545,993	547,736	549,436
10	Saratov – city		922,363	924,479	926,723	929,116	931,681	934,411	937,278	940,243	943,268	946,280	949,215
11	Volgograd – city		1,018,972	1,021,310	1,023,789	1,026,433	1,029,266	1,032,282	1,035,447	1,038,725	1,042,067	1,045,394	1,048,637
12	Voronezh – oblast		2,516,921	2,522,697	2,528,820	2,535,350	2,542,349	2,549,799	2,557,616	2,565,714	2,573,968	2,582,185	2,590,196
13													
14	NATURAL GAS PRICE												
15	Industrial/DH	US$/1000m³	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
16	Change from 1993		166.67%	166.67%	166.67%	166.67%	166.67%	166.67%	166.67%	166.67%	166.67%	166.67%	166.67%
17	Annual Change		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18	Commercial	US$/1000m³	133.50	133.50	133.50	133.50	133.50	133.50	133.50	133.50	133.50	133.50	133.50
19	Change from 1993		790.00%	790.00%	790.00%	790.00%	790.00%	790.00%	790.00%	790.00%	790.00%	790.00%	790.00%
20	Annual Change		16.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
21	Residential (Cooking)	US$/1000m³	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
22	Change from 1993		5900.00%	5900.00%	5900.00%	5900.00%	5900.00%	5900.00%	5900.00%	5900.00%	5900.00%	5900.00%	5900.00%
23	Annual Change		27.66%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
24	Resid. (Cook + HW)	US$/1000m³	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
25	Change from 1993		2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%
26	Annual Change		22.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
27	Resid. (Cook + HW + SH)	US$/1000m³	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
28	Change from 1993		2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%	2900.00%
29	Annual Change		22.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30													
31	DISTILLATE FUEL OIL PRICE												
32	Industrial/DH equiv.	US$/1000m³	250.98	250.98	250.98	250.98	250.98	250.98	250.98	250.98	250.98	250.98	250.98
33	Change from 1993		127.28%	127.28%	127.28%	127.28%	127.28%	127.28%	127.28%	127.28%	127.28%	127.28%	127.28%
34	Annual Change		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
35	Commercial equiv.	US$/1000m³	413.21	413.21	413.21	413.21	413.21	413.21	413.21	413.21	413.21	413.21	413.21
36	Change from 1993		274.18%	274.18%	274.18%	274.18%	274.18%	274.18%	274.18%	274.18%	274.18%	274.18%	274.18%
37	Annual Change		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
38	Residential equiv.	US$/1000m³	581.99	581.99	581.99	581.99	581.99	581.99	581.99	581.99	581.99	581.99	581.99
39	Change from 1993		670.00%	670.00%	670.00%	670.00%	670.00%	670.00%	670.00%	670.00%	670.00%	670.00%	670.00%
40	Annual Change		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
41													
42	RESIDUAL FUEL OIL PRICE												
43	Industrial/DH equiv.	US$/1000m³		80.00	80.00	80.00	88.00	100.00	100.00	100.00	100.00	100.00	100.00
44	Change from 1993						10.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
45	Annual Change						10.00%	13.64%	0.00%	0.00%	0.00%	0.00%	0.00%
46													
47	ELECTRICITY PRICE												
48	Industrial/DH equiv.	US$/1000m³		372.23	372.23	372.23	559.83	747.43	747.43	747.43	747.43	747.43	747.43
49	Change from 1993						50.40%	100.80%	100.80%	100.80%	100.80%	100.80%	100.80%
50	Annual Change						50.40%	33.51%	0.00%	0.00%	0.00%	0.00%	0.00%
51	Commercial equiv.	US$/1000m³		372.23	372.23	372.23	446.78	521.34	595.90	670.46	745.02	819.57	894.13
52	Change from 1993						20.03%	40.06%	60.09%	80.12%	100.15%	120.18%	140.21%
53	Annual Change						20.03%	16.69%	14.30%	12.51%	11.12%	10.01%	9.10%
54	Residential equiv.	US$/1000m³		142.66	142.66	142.66	285.33	356.66	427.99	499.33	570.66	713.32	855.99
55	Change from 1993						100.00%	150.00%	200.00%	250.00%	300.00%	400.00%	500.00%
56	Annual Change						100.00%	25.00%	20.00%	16.67%	14.29%	25.00%	20.00%
57													
58	PREFERENCE FOR GAS												
59	Residential (Cooking)	elect/gas				90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
60	Resid. (Cook + HW)	elect/gas				90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
61	Resid. (Cook + HW +SH)	elect/gas				90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
62	Commercial	DFO/gas, elect/gas				100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
63	Industrial/DH	RFO/gas				100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
64													
65	AVERAGE APARTMENT SIZE	m²				40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
66													
67	NUMBER OF APARTMENTS												
68	Ryazan – city					165,836	166,238	166,597	166,936	167,269	167,598	167,932	168,279
69	(persons per apartment)					3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17
70	Saratov – city					295,000	295,715	296,354	296,957	297,548	298,135	298,729	299,346
71	(persons per apartment)					3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07
72	Volgograd – city					305,232	305,972	306,633	307,257	307,869	308,476	309,090	309,729
73	(persons per apartment)					3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28
74	Voronezh – oblast					1,043,501	1,046,031	1,048,290	1,050,425	1,052,516	1,054,590	1,056,891	1,058,874
75	(persons per apartment)					2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
76													
77	APARTMENTS WITH COOKERS												
78	Ryazan – city												
79	Existing		154,451	158,697	161,171	163,379	163,379	163,741	164,064	164,369	164,668	164,965	165,266
80	Additions						362	323	305	299	297	300	312
61	Penetration Rate						98%	98%	98%	98%	98%	98%	98%

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
41													
42	RESIDUAL FUEL OIL PRICE												
43	Industrial/DH equiv.	US$/1000m³	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
44	Change from 1993		25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
45	Annual Change		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
46													
47	ELECTRICITY PRICE												
48	Industrial/DH equiv.	US$/1000m³	747.43	747.43	747.43	747.43	747.43	747.43	747.43	747.43	747.43	747.43	747.43
49	Change from 1993		100.80%	100.80%	100.80%	100.80%	100.80%	100.80%	100.80%	100.80%	100.80%	100.80%	100.80%
50	Annual Change		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
51	Commercial equiv.	US$/1000m³	968.69	968.69	968.69	968.69	968.69	968.69	968.69	968.69	968.69	968.69	968.69
52	Change from 1993		160.24%	160.24%	160.24%	160.24%	160.24%	160.24%	160.24%	160.24%	160.24%	160.24%	160.24%
53	Annual Change		8.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
54	Residential equiv.	US$/1000m³	998.65	998.65	998.65	998.65	998.65	998.65	998.65	998.65	998.65	998.65	998.65
55	Change from 1993		600.00%	600.00%	600.00%	600.00%	600.00%	600.00%	600.00%	600.00%	600.00%	600.00%	600.00%
56	Annual Change		16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
57													
58	PREFERENCE FOR GAS												
59	Residential (Cooking)	elect/gas	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
60	Resid. (Cook + HW)	elect/gas	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
61	Resid. (Cook + HW +SH)	elect/gas	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
62	Commercial	DFO/gas, elect/gas	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
63	Industrial/DH	RFO/gas	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
64													
65	AVERAGE APARTMENT SIZE	m²	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
66													
67	NUMBER OF APARTMENTS												
68	Ryazan – city		3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17
69	(persons per apartment)		299,997	300,685	301,415	302,193	303,027	303,915	304,847	305,812	306,796	307,776	308,730
70	Saratov – city		3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07
71	(persons per apartment)		310,402	311,114	311,869	312,675	313,538	314,457	315,421	316,419	317,437	318,451	319,439
72	Volgograd – city		3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28
73	(persons per apartment)		1,061,176	1,063,811	1,066,192	1,068,946	1,071,896	1,075,037	1,078,333	1,081,747	1,085,227	1,088,692	1,092,070
74	Voronezh – oblast		2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
75	(persons per apartment)												
76													
77	APARTMENTS WITH COOKERS												
78	Ryazan – city		165,578	165,907	166,255	166,625	167,018	167,440	167,890	168,361	168,849	169,347	169,843
79	Existing		329	348	369	394	422	449	471	488	498	496	483
80	Additions		98%	98%	98%	98%	98%	98%	98%	[illegible]	98%	98%	98%
81	Penetration Rate												

GAS DEMAND FORECAST MODEL — CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
82	Saratov – city												
83	Existing		282,192	288,615	292,427	293,640	293,640	294,484	295,059	295,602	296,134	296,652	297,196
84	Additions						644	575	543	532	528	535	555
85	Penetration Rate						100%	100%	100%	100%	100%	99%	99%
86	Volgograd – city												
87	Existing		286,811	291,560	292,805	295,718	295,718	296,382	296,977	297,539	298,089	298,635	299,188
88	Additions						666	595	562	550	546	553	575
89	Penetration Rate						97%	97%	97%	97%	97%	97%	97%
90	Voronezh – oblast												
91	Existing		331,981	335,637	358,749	371,009	371,009	373,286	375,319	377,241	379,122	380,969	382,880
92	Additions						2,277	2,033	1,921	1,882	1,867	1,891	1,965
93	Penetration Rate						36%	36%	36%	36%	36%	36%	36%
94													
95	APTS. WITH GAS WATER HEATERS												
96	Ryazan – city												
97	Existing		44,790	44,882	44,996	44,882	44,882	45,244	45,567	45,872	46,171	46,468	46,769
98	Additions						362	323	305	299	297	300	312
99	Penetration Rate						27%	27%	27%	28%	28%	28%	28%
100	Saratov – city												
101	Existing		39,708	39,738	39,306	39,353	39,383	40,027	40,602	41,145	41,677	42,205	42,739
102	Additions						644	575	543	532	528	535	555
103	Penetration Rate						14%	14%	14%	14%	14%	14%	14%
104	Volgograd – city												
105	Existing		114,156	115,783	115,826	115,941	115,941	116,607	117,202	117,764	118,314	118,860	119,413
106	Additions						666	595	562	550	546	553	575
107	Penetration Rate						38%	38%	38%	38%	39%	39%	39%
108	Voronezh – oblast												
109	Existing		142,604	147,876	148,693	150,446	150,446	152,723	154,756	156,678	158,559	160,426	162,317
110	Additions						2,277	2,033	1,921	1,882	1,867	1,891	1,965
111	Penetration Rate						15%	15%	15%	15%	15%	15%	16%
112													
113	APTS. WITH GAS SPACE HEATERS												
114	Ryazan – city												
115	Existing		15,981	15,981	15,981	17,362	17,362	17,723	18,047	18,352	18,651	18,948	19,248
116	Additions						362	323	305	299	297	300	312
117	Penetration Rate						11%	11%	11%	11%	11%	11%	12%
118	Saratov – city												
119	Existing		59,506	58,293	58,952	58,517	58,517	59,161	59,736	60,279	60,811	61,339	61,873
120	Additions						644	575	543	532	528	535	555
121	Penetration Rate						20%	20%	20%	20%	21%	21%	21%

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GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
82	Saratov – city												
83	Existing		297,751	298,337	298,957	299,613	300,314	301,065	301,864	302,702	303,571	304,457	305,338
84	Additions		586	620	657	700	751	799	839	869	885	882	859
85	Penetration Rate		99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
86	Volgograd – city												
87	Existing		299,763	300,369	301,010	301,690	302,414	303,191	304,018	304,886	305,785	306,701	307,613
88	Additions		606	641	680	725	777	827	868	899	916	912	889
89	Penetration Rate		97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%
90	Voronezh – oblast												
91	Existing		384,845	386,916	389,108	391,431	393,909	396,565	399,392	402,358	405,431	408,563	411,681
92	Additions		2,071	2,192	2,324	2,478	2,656	2,827	2,966	3,073	3,132	3,118	3,040
93	Penetration Rate		36%	37%	37%	37%	37%	37%	37%	37%	38%	38%	38%
94													
95	APTS. WITH GAS WATER HEATERS												
96	Ryazan – city												
97	Existing		47,081	47,410	47,758	48,128	48,521	48,943	49,393	49,884	50,352	50,850	51,346
98	Additions		329	348	369	394	422	449	471	488	498	496	483
99	Penetration Rate		28%	28%	28%	29%	29%	29%	29%	29%	29%	30%	30%
100	Saratov – city												
101	Existing		43,294	43,880	44,500	45,156	45,857	46,608	47,407	48,245	49,114	50,000	50,881
102	Additions		586	620	657	700	751	799	839	869	885	882	859
103	Penetration Rate		15%	15%	15%	15%	15%	16%	16%	16%	16%	17%	17%
104	Volgograd – city												
105	Existing		119,988	120,594	121,235	121,915	122,639	123,416	124,243	125,111	126,010	126,926	127,838
106	Additions		606	641	680	725	777	827	868	899	916	912	889
107	Penetration Rate		39%	39%	39%	39%	39%	40%	40%	40%	40%	40%	40%
108	Voronezh – oblast												
109	Existing		164,282	166,353	168,545	170,868	173,346	176,002	176,829	181,795	184,868	188,000	191,118
110	Additions		2,071	2,192	2,324	2,478	2,656	2,627	2,966	3,073	3,132	3,118	3,040
111	Penetration Rate		16%	16%	16%	16%	16%	17%	17%	17%	17%	18%	18%
112													
113	APTS. WITH GAS SPACE HEATERS												
114	Ryazan – city												
115	Existing		19,560	19,890	20,238	20,607	21,001	21,423	21,872	22,344	22,832	23,330	23,825
116	Additions		329	348	369	394	422	449	471	483	498	496	483
117	Penetration Rate		12%	12%	12%	12%	13%	13%	13%	13%	14%	14%	14%
118	Saratov – city												
119	Existing		62,428	63,014	63,634	64,290	64,991	65,742	66,541	67,379	68,248	69,134	70,015
120	Additions		586	620	657	700	751	799	339	869	885	882	859
121	Penetration Rate		21%	21%	21%	22%	22%	22%	22%	22%	23%	23%	23%

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
122	Volgograd – city												
123	Existing		51,889	51,889	51,889	51,889	51,889	52,555	53,150	53,712	54,263	54,809	55,362
124	Additions						666	595	562	550	546	553	575
125	Penetration Rate						17%	17%	17%	18%	18%	18%	18%
126	Voronezh – oblast												
127	Existing		63,012	63,012	63,012	66,743	66,743	69,020	71,053	72,975	74,856	76,723	78,614
128	Additions						2,277	2,033	1,921	1,882	1,867	1,891	1,965
129	Penetration Rate						7%	7%	7%	7%	7%	7%	8%
130													
131	INTENSITY OF USE – RESIDENTIAL												
132	Cooker	1000m³/Apt	0.367	0.367	0.367	0.367	0.353	0.340	0.326	0.313	0.299	0.286	0.272
133	Hot Water Heater	1000m³/Apt	0.367	0.367	0.367	0.367	0.356	0.346	0.336	0.326	0.316	0.306	0.295
134	Space Heater	1000m³/Apt	1.711	1.711	1.711	1.711	1.663	1.616	1.569	1.521	1.473	1.426	1.378
135													
136	NUMBER OF COMMERCIAL GAS USERS												
137	Ryazan – city		866	884	899	1,015	1,000	1,006	1,030	1,074	1,119	1,164	1,211
138	Saratov – city		1,136	1,229	1,133	1,133	1,116	1,123	1,149	1,199	1,249	1,300	1,352
139	Volgograd – city		788	776	760	769	758	762	760	814	848	882	917
140	Voronezh – oblast		513	515	532	532	524	527	540	563	586	610	635
141													
142	INTENSITY OF USE – COMMERCIAL												
143	Ryazan – city	1000m³/User	154.7	151.6	149.1	132.0	130.2	128.4	94.9	93.0	91.2	89.4	87.5
144	Saratov – city	1000m³/User	254.2	233.4	232.7	251.4	247.9	244.4	230.1	226.7	223.2	219.7	216.2
145	Volgograd – city	1000m³/User	560.8	567.5	584.0	638.4	629.5	620.6	487.6	478.7	469.9	461.0	452.1
146	Voronezh – oblast	1000m³/User	824.6	863.4	831.5	843.3	831.6	819.9	765.7	754.0	742.3	730.6	718.9
147													
148	COMMERCIAL CONSUMPTION												
149	Ryazan – city												
150	Consumption	1000m³	134,000	134,000	134,000	134,000	130,191	129,142	97,664	99,893	102,022	104,049	105,971
151	Mun. DH Gas Savings	1000m³							31,860				
152	Saratov – city												
153	Consumption	1000m³	288,728	288,907	283,594	284,805	276,709	274,480	264,517	271,701	278,712	285,545	292,194
154	Mun. DH Gas Savings	1000m³							5,950				
155	Volgograd – city												
156	Consumption	1000m³	441,900	440,400	455,500	490,900	476,945	473,103	380,379	389,515	398,302	406,729	414,788
157	Mun. DH Gas Savings	1000m³							85,807				
158	Voronezh – oblast												
159	Consumption	1000m³	423,018	444,663	442,371	448,625	435,872	432,360	413,240	424,409	435,303	445,914	456,233
160	Mun. DH Gas Savings	1000m³							12,800				
161													
162	INDUSTRIAL INDICATORS												
163	Output	Index				100.00	88.24	75.76	75.73	81.06	84.86	90.27	95.04
164	Intensity	Index				100.00	98.00	96.04	94.12	92.24	91.31	90.40	89.50
165													

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
122	Volgograd – city												
123	Existing		55,937	56,542	57,183	57,863	58,588	59,365	60,192	61,059	61,958	62,874	63,786
124	Additions		606	641	680	725	777	827	868	899	916	912	839
125	Penetration Rate		18%	18%	19%	19%	19%	19%	19%	20%	20%	20%	20%
126	Voronezh – oblast												
127	Existing		80,579	82,650	84,842	87,165	89,643	92,299	95,126	93,092	101,165	104,297	107,415
128	Additions		2,071	2,192	2,324	2,478	2,658	2,827	2,966	3,073	3,132	3,118	3,040
129	Penetration Rate		8%	8%	8%	8%	9%	9%	9%	9%	10%	10%	10%
130													
131	INTENSITY OF USE – RESIDENTIAL												
132	Cooker	1000m³/Apt	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259
133	Hot Water Heater	1000m³/Apt	0.285	0.275	0.265	0.255	0.244	0.234	0.224	0.214	0.204	0.194	0.183
134	Space Heater	1000m³/Apt	1.331	1.283	1.235	1.188	1.140	1.093	1.045	0.998	0.950	0.903	0.855
135													
136	NUMBER OF COMMERCIAL GAS USERS												
137	Ryazan – city		1,252	1,293	1,334	1,376	1,419	1,462	1,505	1,549	1,593	1,638	1,683
138	Saratov – city		1,397	1,443	1,490	1,538	1,584	1,632	1,680	1,729	1,779	1,829	1,879
139	Volgograd – city		948	979	1,011	1,043	1,075	1,108	1,140	1,174	1,207	1,241	1,275
140	Voronezh – oblast		656	678	699	721	744	766	789	812	835	859	882
141													
142	INTENSITY OF USE – COMMERCIAL												
143	Ryazan – city	1000m³/User	85.7	83.9	82.0	80.2	78.4	76.5	74.7	72.9	71.0	69.2	67.3
144	Saratov – city	1000m³/User	212.7	209.2	205.7	202.2	198.7	195.2	191.7	188.3	184.8	181.3	177.8
145	Volgograd – city	1000m³/User	443.3	434.4	425.5	416.7	407.8	399.0	390.1	381.2	372.4	363.5	354.6
146	Voronezh – oblast	1000m³/User	707.2	695.5	683.7	672.0	660.3	648.6	636.9	625.2	613.5	601.8	590.0
147													
148	COMMERCIAL CONSUMPTION												
149	Ryazan – city												
150	Consumption	1000m³	107,244	108,403	109,446	110,371	111,176	111,859	112,418	112,851	113,155	113,328	113,369
151	Mun. DH Gas Savings	1000m³											
152	Saratov – city												
153	Consumption	1000m³	297,154	301,895	306,413	310,705	314,765	318,591	322,177	325,520	328,615	331,458	334,045
154	Mun. DH Gas Savings	1000m³											
155	Volgograd – city												
156	Consumption	1000m³	420,346	425,495	430,229	434,541	438,422	441,866	444,865	447,411	449,497	451,115	452,258
157	Mun. DH Gas Savings	1000m³											
158	Voronezh – oblast												
159	Consumption	1000m³	463,910	471,241	478,220	484,840	491,095	496,978	502,483	507,602	512,331	516,660	520,584
160	Mun. DH Gas Savings	1000m³											
161													
162	INDUSTRIAL INDICATORS												
163	Output	Index	98.22	102.39	105.98	110.17	113.93	118.81	122.81	128.30	132.82	138.85	143.76
164	Intensity	Index	88.60	88.60	88.60	88.60	88.60	88.60	88.60	88.60	88.60	88.60	88.60
165													

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
166	INDUSTRIAL CONSUMPTION – RYAZAN												
167	Electronpribor Corp.												
168	Consumption	1000m³				33,260	28,769	24,205	23,168	24,301	25,187	26,525	27,649
169	Gas savings from	1000m³							545				
170	Blowdown ht rec.; new												
171	burner, boiler conv.												
172	Tannery Plant												
173	Consumption	1000m³				19,850	17,165	14,442	13,156	13,799	14,302	15,061	15,700
174	Gas savings from	1000m³							993				
175	combustion air preheat												
176	Color Metal Mfg. Reproc												
177	Consumption	1000m³				30,000	25,942	21,827	20,783	21,800	22,594	23,794	24,802
178	Gas savings from	1000m³							600				
179	controls												
180	Metal Forging Press Plant												
181	Consumption	1000m³				13,750	11,590	10,004	7,051	7,336	7,665	8,072	8,414
182	Gas savings from	1000m³							2,750				
183	waste heat recovery												
184													
185	All Industrial Consumption	1000m³	660,200	658,400	629,300	475,531	411,464	346,198	339,163	355,748	368,707	388,294	404,747
186	Minus the Consumption of the												
187	Above Plants, if Recorded												
188													
189	INDUSTRIAL CONSUMPTION – SARATOV												
190	Nitron Chemical Factory												
191	Consumption	1000m³				85,600	74,021	62,279	60,694	63,662	65,981	69,485	72,430
192	Gas savings from	1000m³							320				
193	controls												
194	Rubber Products Factory												
195	Consumption	1000m³				19,500	16,862	14,187	7,027	7,371	7,639	8,045	8,386
196	Gas savings from	1000m³							6,872				
197	Cond. rec.; boilers												
198	Reinforced Concrete Factory												
199	Consumption	1000m³				32,000	27,671	23,282	13,509	14,170	14,686	15,486	16,121
200	Gas savings from	1000m³							9,300				
201	boilers												
202	Glass Factory												
203	Consumption	1000m³				195,000	168,622	141,875	98,992	103,833	107,615	113,332	118,134
204	Gas savings from	1000m³							40,000				
205	heat recovery												
206	Dry Ice/Ice Cream Factory												
207	Consumption	1000m³				10,000	8,647	7,276	6,528	6,847	7,096	7,473	7,790
208	Gas savings from	1000m³							600				
209	CO2 recovery												

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
166	INDUSTRIAL CONSUMPTION – RYAZAN												
167	Electronpribor Corp.												
168	Consumption	1000m³	28,287	29,488	30,521	31,729	32,811	34,218	35,370	36,951	38,251	39,990	41,402
169	Gas savings from	1000m³											
170	Blowdown ht rec.; new												
171	burner, boiler conv.												
172	Tannery Plant												
173	Consumption	1000m³	16,062	16,744	17,331	18,017	18,631	19,430	20,084	20,982	21,720	22,707	23,509
174	Gas savings from	1000m³											
175	combustion air preheat												
176	Color Metal Mfg. Reproc												
177	Consumption	1000m³	25,375	26,452	27,379	28,463	29,434	30,695	31,729	33,147	34,313	35,873	37,140
178	Gas savings from	1000m³											
179	controls												
180	Metal Forging Press Plant												
181	Consumption	1000m³	8,608	8,974	9,288	9,656	9,985	10,413	10,764	11,245	11,641	12,170	12,600
182	Gas savings from	1000m³											
183	waste heat recovery												
184													
185	All Industrial Consumption	1000m³	414,087	431,675	446,799	464,466	480,325	500,909	517,782	540,928	559,956	585,411	606,083
186	Minus the Consumption of the												
187	Above Plants, If Recorded												
188													
189	INDUSTRIAL CONSUMPTION – SARATOV												
190	Nitron Chemical Factory												
191	Consumption	1000m³	74,102	77,249	79,956	83,121	85,955	89,639	92,658	96,800	100,205	104,761	108,460
192	Gas savings from	1000m³											
193	controls												
194	Rubber Products Factory												
195	Consumption	1000m³	8,580	8,944	9,257	9,624	9,952	10,378	10,728	11,208	11,602	12,129	12,558
196	Gas savings from	1000m³											
197	Cond. rec.; boilers												
198	Reinforced Concrete Factory												
199	Consumption	1000m³	16,493	17,194	17,796	18,501	19,131	19,951	20,623	21,545	22,303	23,317	24,140
200	Gas savings from	1000m³											
201	boilers												
202	Glass Factory												
203	Consumption	1000m³	120,860	125,994	130,408	135,570	140,193	146,201	151,126	157,882	163,435	170,885	176,899
204	Gas savings from	1000m³											
205	heat recovery												
206	Dry Ice/Ice Cream Factory												
207	Consumption	1000m³	7,970	8,308	8,599	8,940	9,245	9,64[illegible]	9,[illegible]66	10,411	10,777	11,267	11,665
208	Gas savings from	1000m³											
209	CO2 recovery												

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
210	Red Brick Factory												
211	Consumption	1000m³				25,500	22,051	18,553	16,556	17,363	17,998	18,954	19,757
212	Gas savings from	1000m³							1,620				
213	boiler replacement												
214	Food Processing Plant												
215	Consumption	1000m³				36,300	31,390	26,411	21,644	22,702	23,529	24,779	25,829
216	Gas savings	1000m³							4,230				
217	Electrounit Plant												
218	Consumption	1000m³				28,000	24,212	20,372	15,758	16,528	17,130	18,041	18,805
219	Gas savings from	1000m³							4,200				
220	boiler replacement												
221													
222	All Industrial Consumption	1000m³	1,061,436	1,106,399	1,072,717	594,569	514,140	432,587	423,797	444,521	460,714	485,188	505,747
223	Minus the Consumption of the												
224	Above Plants, if Recorded												
225													
226	INDUSTRIAL CONSUMPTION – VOLGOGRAD												
227	Silica Bldg Mats Factory												
228	Consumption	1000m³				48,500	41,939	35,287	22,870	23,988	24,882	26,183	27,292
229	Gas savings from cond.	1000m³							11,700				
230	rec; smelter; burners												
231	Petrov Factory												
232	Consumption	1000m³				80,700	69,783	58,714	49,521	51,943	53,835	56,695	59,097
233	Gas savings from cond.	1000m³							8,000				
234	return; burners												
235	Aluminum Plant												
236	Consumption	1000m³				39,000	33,724	28,375	22,198	23,284	24,132	25,414	26,481
237	Gas savings from insul;	1000m³							5,600				
238	ht rec; burners; cont.												
239	Drilling Equip. Factory												
240	Consumption	1000m³				80,000	69,178	58,205	42,822	44,916	46,553	49,026	51,103
241	Gas savings from	1000m³							14,200				
242	cont; burners; insulation												
243	Greenhouse Zarya												
244	Consumption	1000m³				18,500	15,967	13,460	11,086	11,629	12,052	12,692	13,230
245	Gas savings from	1000m³							2,100				
246	new burners												
247	Red October												
248	Consumption	1000m³				352,700	304,989	256,612	235,577	247,097	256,099	269,703	281,132
249	Gas savings from ht	1000m³							15,820				
250	rec; new burners												

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
210	Red Brick Factory												
211	Consumption	1000m³	20,213	21,072	21,810	22,673	23,447	24,451	25,275	26,403	27,334	28,576	29,585
212	Gas savings from	1000m³											
213	boiler replacement												
214	Food Processing Plant												
215	Consumption	1000m³	26,425	27,548	28,513	29,641	30,652	31,966	33,043	34,520	35,734	37,358	38,678
216	Gas savings	1000m³											
217	Electrounit Plant												
218	Consumption	1000m³	19,239	20,056	20,759	21,580	22,316	23,273	24,057	25,132	26,016	27,199	28,159
219	Gas savings from	1000m³											
220	boiler replacement												
221													
222	All Industrial Consumption	1000m³	517,418	539,394	558,293	580,393	600,185	625,905	646,989	675,910	699,687	731,494	757,324
223	Minus the Consumption of the												
224	Above Plants, if Recovered												
225													
226	INDUSTRIAL CONSUMPTION – VOLGOGRAD												
227	Silica Bldg Mats Factory												
228	Consumption	1000m³	27,922	29,108	30,128	31,320	32,388	33,776	34,914	36,475	37,758	39,474	40,868
229	Gas savings from cond.	1000m³											
230	rec; smelter; burners												
231	Petrov Factory												
232	Consumption	1000m³	60,461	63,029	65,237	67,820	70,133	73,138	75,602	78,981	81,760	85,476	88,495
233	Gas savings from cond.	1000m³											
234	return; burners												
235	Aluminum Plant												
236	Consumption	1000m³	27,102	28,253	29,243	30,401	31,438	32,785	33,889	35,404	36,649	38,316	39,669
237	Gas savings from insul;	1000m³											
238	ht rec; burners; cont.												
239	Drilling Equip. Factory												
240	Consumption	1000m³	52,282	54,503	58,412	56,846	60,645	63,244	65,375	68,297	70,700	73,913	76,524
241	Gas savings from	1000m³											
242	cont; burners; insulation												
243	Greenhouse Zarya												
244	Consumption	1000m³	13,536	14,110	14,605	15,183	15,701	16,374	16,925	17,682	18,304	19,136	19,811
245	Gas savings from	1000m³											
246	new burners												
247	Red October												
248	Consumption	1000m³	287,619	299,835	310,340	322,625	333,627	347,924	359,644	375,721	388,937	406,618	420,976
249	Gas savings from ht	1000m³											
250	rec; new burners												

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
251	Protein Vitamin Concentrates												
252	Consumption	1000m³				40,000	34,589	29,103	24,811	26,024	26,972	28,405	29,609
253	Gas savings from ht	1000m³							3,700				
254	rec; new burners												
255													
256	All Industrial Consumption	1000m³	2,333,000	2,269,500	2,185,500	1,327,400	1,147,839	993,768	946,144	992,411	1,028,563	1,083,202	1,129,102
257	Minus the Consumption of the												
258	Above Plants, if Recorded												
259													
260	INDUSTRIAL CONSUMPTION – VORONEZH												
261	Aluminum Materials Plant												
262	Consumption	1000m³				24,000	20,753	17,462	16,157	16,947	17,564	18,497	19,281
263	Gas savings from	1000m³							950				
264	control replacement												
265	Building Materials Co.												
266	Consumption	1000m³				34,700	30,006	25,246	19,518	20,473	21,219	22,346	23,293
267	Gas savings from ht	1000m³							5,215				
268	rec; reserv; burners												
269	Locomotive Maint. Plant												
270	Consumption	1000m³				29,900	25,855	21,754	20,612	21,620	22,408	23,598	24,598
271	Gas savings from	1000m³							700				
272	condensate recovery												
273	Heavy Excavator Plant												
274	Consumption	1000m³				27,100	23,434	19,717	17,516	18,373	19,042	20,054	20,904
275	Gas savings from	1000m³							1,800				
276	burner replacement												
277													
278	All Industrial Consumption	1000m³	N/A	N/A	N/A	2,273,957	1,966,352	1,654,449	1,620,830	1,700,090	1,762,021	1,855,624	1,934,255
279	Minus the Consumption of the												
280	Above Plants, if Recorded												
281													
282	DISTRICT HEATING INDICATORS												
283	Output	Index				100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
284	Intensity	Index				100.00	99.00	98.01	97.03	96.06	95.10	94.15	93.21
285													
286	DISTRICT HEATING CONSUMPTION – RYAZAN *												
287	Novoryanskaya (TETS)												
288	Consumption	1000m³	1,124,200	1,173,200	1,148,500	1,099,500	1,088,505	1,077,620	1,062,964	1,052,334	1,041,811	1,031,393	1,021,079
289	Gas savings from	1000m³							3,880	0	0	0	0
290	controls, infiltration												
291	Dyagilevskaya (TETS)												
292	Consumption	1000m³	182,500	226,400	235,300	242,900	240,471	238,068	232,786	230,458	228,153	225,872	223,613
293	Gas savings from	1000m³							2,900	0	0	0	0
294	economizer, infiltration												

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
251	Protein Vitamin Concentrates												
252	Consumption	1000m³	30,292	31,579	32,685	33,979	35,138	36,644	37,878	39,571	40,983	42,825	44,358
253	Gas savings from ht	1000m³											
254	rec; new burners												
255													
256	All Industrial Consumption	1000m³	1,155,157	1,204,220	1,246,412	1,295,752	1,339,938	1,397,360	1,444,429	1,508,998	1,562,080	1,633,090	1,690,758
257	Minus the Consumption of the												
258	Above Plants, if Recorded												
259													
260	INDUSTRIAL CONSUMPTION – VORONEZH												
261	Aluminum Materials Plant												
262	Consumption	1000m³	19,726	20,564	21,284	22,127	22,881	23,862	24,666	25,768	26,675	27,687	28,872
263	Gas savings from	1000m³											
264	control replacement												
265	Building Materials Co.												
266	Consumption	1000m³	23,830	24,842	25,713	26,731	27,642	28,827	29,798	31,130	32,225	33,690	34,879
267	Gas savings from ht	1000m³											
268	rec; reseal; burners												
269	Locomotive Maint. Plant												
270	Consumption	1000m³	25,168	26,234	27,154	28,228	29,191	30,442	31,467	32,874	34,031	35,578	36,834
271	Gas savings from	1000m³											
272	condensate recovery												
273	Heavy Excavator Plant												
274	Consumption	1000m³	21,386	22,294	23,075	23,989	24,807	25,870	26,741	27,937	28,919	30,234	31,302
275	Gas savings from	1000m³											
276	burner replacement												
277													
278	All Industrial Consumption	1000m³	1,978,889	2,062,938	2,135,218	2,219,740	2,295,435	2,393,804	2,474,438	2,585,051	2,675,985	2,797,832	2,896,422
279	Minus the Consumption of the												
280	Above Plants, if Recorded												
281													
282	DISTRICT HEATING INDICATORS												
283	Output	Index	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
284	Intensity	Index	92.27	91.35	90.44	89.53	88.64	87.75	86.87	86.01	85.15	84.29	83.45
285													
286	DISTRICT HEATING CONSUMPTION – RYAZAN *												
287	Novoryanskaya (TETS)												
288	Consumption	1000m³	1,010,868	1,000,759	990,752	980,844	971,036	961,325	951,712	942,195	932,773	923,445	914,211
289	Gas savings from	1000m³											
290	controls, infiltration												
291	Dyagilevskaya (TETS)												
292	Consumption	1000m³	221,377	219,163	216,971	214,802	212,654	210,527	208,422	206,338	204,274	202,232	200,209
293	Gas savings from	1000m³											
294	economizer, infiltration												

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
295	Ryazanenegro (overall)												
296	Consumption	1000m³											
297	Gas savings from	1000m³							(26,900)	(26,900)	(26,900)	(26,900)	(26,900)
298	BTU meters & controls								26,900				
299													
300	Gas for Replacement of												
301	Lost Power Generation	1000m³											
302									0	0	0	0	0
303	DISTRICT HEATING CONSUMPTION – SARATOV *												
304	GRES												
305	Consumption	1000m³	210,265	203,135	196,663	200,500	198,495	196,510	194,545	192,600	190,674	188,767	186,879
306	Gas savings	1000m³							0	0	0	0	0
307	TETS 1												
308	Consumption	1000m³	137,118	145,812	140,505	135,600	134,244	132,902	131,573	130,257	128,954	127,665	126,388
309	Gas savings	1000m³							0	0	0	0	0
310	TETS 2												
311	Consumption	1000m³	768,957	789,830	702,987	764,200	756,558	748,992	741,502	734,087	726,747	719,479	712,284
312	Gas savings	1000m³							0	0	0	0	0
313	TETS 5												
314	Consumption	1000m³	768,590	708,622	565,168	571,300	565,587	559,931	547,282	541,809	536,391	531,027	525,717
315	Gas savings from	1000m³							7,050	0	0	0	0
316	economizer, infiltration												
317	Saratovenegro (overall)												
318	Consumption	1000m³											
319	Gas savings from	1000m³							(48,180)	(48,180)	(48,180)	(48,180)	(48,180)
320	BTU meters & controls								48,180				
321													
322	Gas for Replacement of												
323	Lost Power Generation	1000m³											
324									0	0	0	0	0
325	DISTRICT HEATING CONSUMPTION – VOLGOGRAD *												
326	GRES												
327	Consumption	1000m³	443,500	469,100	450,500	449,000	444,510	440,065	435,664	431,308	426,995	422,725	418,497
328	Gas savings	1000m³							0	0	0	0	0
329	TETS 2												
330	Consumption	1000m³	443,400	469,000	441,100	520,100	514,899	509,750	504,653	499,606	494,610	489,664	484,767
331	Gas savings	1000m³							0	0	0	0	0
332	Volgogradenegro (overall)												
333	Consumption	1000m³											
334	Gas savings from	1000m³							(22,150)	(22,150)	(22,150)	(22,150)	(22,150)
335	instrumentation; burners								22,150				
336													
337	Gas for Replacement of												
338	Lost Power Generation	1000m³											
339									0	0	0	0	0

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
295	Ryazanenegro (overall)												
296	Consumption	1000m³	(26,900)	(26,900)	(26,900)	(26,900)	(26,900)	(26,900)	(26,900)	(26,900)	(26,900)	(26,900)	(26,900)
297	Gas savings from	1000m³											
298	BTU meters & controls												
299													
300	Gas for Replacement of												
301	Lost Power Generation	1000m³	0	0	0	0	0	0	0	0	0	0	0
302													
303	DISTRICT HEATING CONSUMPTION – SARATOV *												
304	GRES												
305	Consumption	1000m³	185,010	183,160	181,329	179,515	177,720	175,943	174,184	172,442	170,717	169,010	167,320
306	Gas savings	1000m³											
307	TETS 1												
308	Consumption	1000m³	125,124	123,873	122,634	121,408	120,194	118,992	117,802	116,624	115,458	114,303	113,160
309	Gas savings	1000m³											
310	TETS 2												
311	Consumption	1000m³	705,161	698,110	691,129	684,217	677,375	670,602	663,896	657,257	650,684	644,177	637,735
312	Gas savings	1000m³											
313	TETS 5												
314	Consumption	1000m³	520,460	515,255	510,102	505,001	499,951	494,952	490,002	485,102	480,251	475,449	470,694
315	Gas savings from	1000m³											
316	economizer, infiltration												
317	Saratovenegro (overall)												
318	Consumption	1000m³	(48,180)	(48,180)	(48,180)	(48,180)	(48,180)	(48,180)	(48,180)	(48,180)	(48,180)	(48,180)	(48,180)
319	Gas savings from	1000m³											
320	BTU meters & controls												
321													
322	Gas for Replacement of												
323	Lost Power Generation	1000m³	0	0	0	0	0	0	0	0	0	0	0
324													
325	DISTRICT HEATING CONSUMPTION – VOLGOGRAD *												
326	GRES												
327	Consumption	1000m³	414,312	410,169	406,068	402,007	397,987	394,007	390,067	386,166	382,305	378,481	374,697
328	Gas savings	1000m³											
329	TETS 2												
330	Consumption	1000m³	479,920	475,120	470,369	465,665	461,009	456,399	451,835	447,316	442,843	438,415	434,031
331	Gas savings	1000m³											
332	Volgogradenegro (overall)												
333	Consumption	1000m³	(22,150)	(22,150)	(22,150)	(22,150)	(22,150)	(22,150)	(22,150)	(22,150)	(22,150)	(22,150)	(22,150)
334	Gas savings from	1000m³											
335	instrumentation; burners												
336													
337	Gas for Replacement of												
338	Lost Power Generation	1000m³	0	0	0	0	0	0	0	0	0	0	0
339													

GAS DEMAND FORECAST MODEL — CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
340	DISTRICT HEATING CONSUMPTION – VORONEZH *												
341	TETS 1												
342	Consumption	1000m³				1,030,000	1,019,700	1,009,503	996,018	986,058	976,197	966,435	956,771
343	Gas savings from	1000m³							3,390	0	0	0	0
344	controls; infiltration												
345	TETS 2												
346	Consumption	1000m³				118,000	116,820	115,652	113,345	112,212	111,090	109,979	108,879
347	Gas savings	1000m³							1,150	0	0	0	0
348	controls; infiltration												
349	Voronezhenergo (overall)												
350	Consumption	1000m³							(27,500)	(27,500)	(27,500)	(27,500)	(27,500)
351	Gas savings	1000m³							27,500				
352													
353	Gas for Replacement												
354	of Power Generation	1000m³							0	0	0	0	0
355	Note: Additional hot water for district heating is												
356	produced in municipal and industrial boilers.												
357	Gas consumed in this manner is accounted for												
358	in the commercial and industrial statistics.												
359	PRE-OIL SUBSTITUTION GAS CONSUMPTION BY SECTOR												
360	Ryazan												
361	Residential		100,394	101,984	102,933	108,062	103,440	100,677	97,828	94,923	91,970	88,982	85,974
362	Commercial		134,000	134,000	134,000	134,000	130,191	129,142	97,664	99,893	102,022	104,049	105,971
363	Industrial		600,200	658,400	629,300	572,700	495,229	416,676	403,321	423,044	438,454	461,746	481,312
364	District Heating		1,306,700	1,399,800	1,383,800	1,342,400	1,328,976	1,315,686	1,268,849	1,255,892	1,243,064	1,230,364	1,217,792
365	Total		2,201,294	2,293,984	2,250,033	2,155,162	2,057,836	1,962,181	1,867,663	1,873,751	1,875,510	1,885,142	1,891,049
366	Saratov												
367	Residential		219,825	220,115	222,504	222,285	216,676	210,817	204,805	198,692	192,495	186,238	179,941
368	Commercial		288,728	286,907	263,594	284,805	276,709	274,480	264,517	271,701	278,712	285,545	292,194
369	Industrial		1,061,435	1,106,399	1,072,717	1,026,469	887,615	746,822	664,534	696,999	722,389	760,765	793,001
370	District Heating		1,684,930	1,847,399	1,605,323	1,671,800	1,654,834	1,638,335	1,566,722	1,550,573	1,534,585	1,518,758	1,503,088
371	Total		3,454,919	3,460,820	3,164,133	3,205,159	3,035,884	2,670,453	2,700,548	2,717,965	2,728,182	2,751,303	2,768,225
372	Volgograd												
373	Residential		235,787	238,125	238,597	239,706	233,660	227,355	220,893	214,325	207,670	200,952	194,197
374	Commercial		441,900	440,400	455,500	490,900	476,945	473,103	380,379	389,515	398,302	406,729	414,788
375	Industrial		2,333,000	2,269,300	2,135,500	1,986,800	1,718,039	1,445,524	1,355,030	1,421,292	1,473,068	1,551,321	1,617,058
376	District Heating		886,900	938,100	891,600	969,100	959,409	949,815	918,167	908,764	899,454	890,238	881,115
377	Total		3,897,587	3,885,925	3,771,197	3,686,506	3,388,054	3,095,797	2,874,469	2,933,896	2,978,494	3,049,240	3,107,155
378	Voronezh												
379	Residential		281,807	285,081	293,655	305,375	301,081	295,902	290,164	284,106	277,731	271,135	264,419
380	Commercial		423,018	444,663	442,371	448,625	435,872	432,360	413,240	424,409	435,303	445,914	456,233
381	Industrial		N/A	N/A	N/A	2,399,657	2,066,401	1,738,628	1,694,634	1,777,502	1,842,254	1,940,119	2,022,330
382	District Heating		N/A	N/A	N/A	1,148,000	1,136,520	1,125,155	1,081,863	1,070,770	1,059,787	1,048,914	1,038,150
383	Total		N/A	N/A	N/A	4,291,657	3,929,874	3,592,045	3,479,920	3,556,787	3,615,075	3,706,085	3,781,132
384													

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
340	DISTRICT HEATING CONSUMPTION – VORONEZH *												
341	TETS 1												
342	Consumption	1000m³	947,203	937,731	928,354	919,070	909,880	900,781	891,773	882,855	874,027	865,286	856,634
343	Gas savings from	1000m³											
344	controls; infiltration												
345	TETS 2												
346	Consumption	1000m³	107,790	106,712	105,645	104,589	103,543	102,507	101,482	100,468	99,463	98,468	97,484
347	Gas savings	1000m³											
348	controls; infiltration												
349	Voronezhenergo (overall)												
350	Consumption	1000m³	(27,500)	(27,500)	(27,500)	(27,500)	(27,500)	(27,500)	(27,500)	(27,500)	(27,500)	(27,500)	(27,500)
351	Gas savings	1000m³											
352													
353	Gas for Replacement												
354	of Power Generation	1000m³	0	0	0	0	0	0	0	0	0	0	0
355	Note: Additional hot water for district heating is												
356	produced in municipal and industrial boilers.												
357	Gas consumed in this manner is accounted for												
358	in the commercial and industrial statistics.												
359	PRE-OIL SUBSTITUTION GAS CONSUMPTION BY SECTOR												
360	Ryazan												
361	Residential		82,954	82,159	81,360	80,561	79,763	78,959	78,137	77,286	76,391	75,438	74,408
362	Commercial		107,244	108,403	109,446	110,371	111,176	111,859	112,416	112,851	113,155	113,328	113,369
363	Industrial		492,419	513,333	531,319	552,351	571,187	595,865	615,729	643,254	665,881	696,152	720,734
364	District Heating		1,205,345	1,193,022	1,180,823	1,168,746	1,156,789	1,144,953	1,133,234	1,121,633	1,110,147	1,098,777	1,087,520
365	Total		1,887,962	1,896,918	1,902,949	1,912,029	1,918,915	1,931,435	1,939,518	1,955,022	1,965,574	1,983,693	1,996,031
366	Saratov												
367	Residential		173,625	171,309	168,988	166,665	164,344	162,012	159,649	157,234	154,742	152,142	149,412
368	Commercial		297,154	301,695	306,413	310,705	314,765	318,591	322,177	325,520	328,615	331,458	334,045
369	Industrial		811,300	845,759	875,392	910,044	941,077	981,403	1,014,464	1,059,813	1,097,064	1,146,967	1,187,468
370	District Heating		1,487,576	1,472,218	1,457,014	1,441,962	1,427,061	1,412,308	1,397,703	1,383,245	1,368,930	1,354,759	1,340,730
371	Total		2,769,654	2,791,181	2,807,806	2,829,375	2,847,246	2,874,318	2,893,994	2,925,812	2,949,381	2,985,326	3,011,655
372	Volgograd												
373	Residential		187,418	184,668	181,911	179,153	176,397	173,631	170,831	167,978	165,045	162,000	158,821
374	Commercial		420,346	425,495	430,229	434,541	438,422	441,866	444,865	447,411	449,497	451,115	452,256
375	Industrial		1,654,371	1,724,638	1,785,064	1,855,726	1,919,007	2,001,245	2,068,856	2,161,129	2,237,150	2,338,849	2,421,438
376	District Heating		872,082	863,140	854,287	845,522	836,846	828,256	819,752	811,333	802,998	794,746	786,577
377	Total		3,134,217	3,197,940	3,251,491	3,314,942	3,370,672	3,444,997	3,504,103	3,587,850	3,654,690	3,746,710	3,819,092
378	Voronezh												
379	Residential		257,620	255,981	254,320	252,654	250,995	249,300	247,492	245,499	243,235	240,590	237,464
380	Commercial		463,910	471,241	478,220	484,840	491,095	496,978	502,483	507,602	512,331	516,660	520,584
381	Industrial		2,068,998	2,156,873	2,232,444	2,320,815	2,399,956	2,502,805	2,587,111	2,702,760	2,797,434	2,925,021	3,028,309
382	District Heating		1,027,493	1,016,943	1,006,499	996,159	985,922	975,788	965,755	955,823	945,990	936,255	926,617
383	Total		3,818,020	3,901,039	3,971,483	4,054,468	4,127,968	4,224,871	4,302,841	4,411,584	4,499,339	4,618,525	4,712,993
384													

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
385	OIL SUBSTITUTION EFFECT												
386	Ryazan												
387	Gas Savings – Industrial						77,471	78,553	13,355	0	0	0	0
388	50% of Gas Avail for Oil Displacement						38,735	39,277	6,678	0	0	0	0
389	Oil Consumption – Industrial						123,807	71,578	31,268	25,791	26,730	28,150	29,343
390	Gas Used to Replace Oil (Annual)						38,735	39,277	6,678	0	0	0	0
391	Gas Used to Replace Oil (Cummulative)						38,735	78,012	84,690	84,690	84,690	84,690	84,690
392													
393	Gas Savings – District Heating						13,424	13,290	46,837	12,957	12,828	12,700	12,573
394	Gas Savings – R/C + ind surplus						6,431	3,812	34,326	677	824	961	1,086
395	Total Gas Savings – DH, R/C,ind surplus						19,855	17,102	81,163	13,635	13,652	13,660	13,658
396	50% of Gas Avail for Oil Displacement						9,928	8,551	40,582	6,817	6,826	6,830	6,829
397	Oil Consumption – District Heating						671,441	654,898	623,338	576,605	564,166	551,646	539,249
398	Gas Used to Replace Oil (Annual)						9,928	8,551	40,582	6,817	6,826	6,830	6,829
399	Gas Used to Replace Oil (Cummulative)						9,928	18,479	59,060	65,877	72,703	79,533	86,362
400													
401	Saratov												
402	Gas Savings – Industrial						138,854	140,794	82,318	0	0	0	0
403	50% of Gas Avail for Oil Displacement						69,427	70,397	41,159	0	0	0	0
404	Oil Consumption – Industrial						221,904	128,291	51,513	10,860	11,256	11,854	12,356
405	Gas Used to Replace Oil (Annual)						69,427	70,397	41,159	0	0	0	0
406	Gas Used to Replace Oil (Cummulative)						69,427	139,824	180,982	180,982	180,982	180,982	180,982
407													
408	Gas Savings – District Heating						16,716	16,549	71,613	16,149	15,988	15,828	15,669
409	Gas Savings – R/C + ind surplus						13,705	8,089	15,974	0	0	0	0
410	Total Gas Savings – DH, R/C,ind surplus						30,421	24,637	87,588	16,149	15,988	15,828	15,669
411	50% of Gas Avail for Oil Displacement						15,211	12,319	43,794	8,075	7,994	7,914	7,835
412	Oil Consumption – District Heating						430,673	411,308	381,549	334,274	322,838	311,595	300,546
413	Gas Used to Replace Oil (Annual)						15,211	12,319	43,794	8,075	7,994	7,914	7,835
414	Gas Used to Replace Oil (Cummulative)						15,211	27,529	71,323	79,397	87,391	95,305	103,140
415													
416	Volgograd												
417	Gas Savings – Industrial						268,761	272,515	90,494	0	0	0	0
418	50% of Gas Avail for Oil Displacement						134,380	136,258	45,247	0	0	0	0
419	Oil Consumption – Industrial						429,510	248,316	105,043	62,721	65,005	68,459	71,359
420	Gas Used to Replace Oil (Annual)						134,380	136,258	45,247	0	0	0	0
421	Gas Used to Replace Oil (Cummulative)						134,380	270,638	315,885	315,885	315,885	315,885	315,885
422													

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
385	OIL SUBSTITUTION EFFECT												
386	Ryazan												
387	Gas Savings – Industrial		0	0	0	0	0	0	0	0	0	0	0
388	50% of Gas Avail for Oil Displacement		0	0	0	0	0	0	0	0	0	0	0
389	Oil Consumption – Industrial		30,020	31,295	32,392	33,674	34,822	36,314	37,538	39,216	40,595	42,441	43,939
390	Gas Used to Replace Oil (Annual)		0	0	0	0	0	0	0	0	0	0	0
391	Gas Used to Replace Oil (Cummulative)		84,690	84,690	84,690	84,690	84,690	84,690	84,690	84,690	84,690	84,690	84,690
392													
393	Gas Savings – District Heating		12,447	12,322	12,199	12,077	11,956	11,837	11,718	11,601	11,485	11,370	11,257
394	Gas Savings – R/C + ind surplus		1,747	0	0	0	0	121	263	419	590	781	987
395	Total Gas Savings – DH, R/C,ind surplus		14,194	12,322	12,199	12,077	11,956	11,958	11,982	12,020	12,076	12,152	12,244
396	50% of Gas Avail for Oil Displacement		7,097	6,161	6,100	6,039	5,978	5,979	5,991	6,010	6,038	6,076	6,122
397	Oil Consumption – District Heating		526,978	514,566	503,208	492,022	481,012	470,173	459,443	448,810	438,266	427,801	417,405
398	Gas Used to Replace Oil (Annual)		7,097	6,161	6,100	6,039	5,978	5,979	5,991	6,010	6,038	6,076	6,122
399	Gas Used to Replace Oil (Cummulative)		93,460	99,621	105,720	111,759	117,737	123,716	129,707	135,717	141,755	147,831	153,953
400													
401	Saratov												
402	Gas Savings – Industrial		0	0	0	0	0	0	0	0	0	0	0
403	50% of Gas Avail for Oil Displacement		0	0	0	0	0	0	0	0	0	0	0
404	Oil Consumption – Industrial		12,341	13,176	13,640	14,180	14,684	15,292	15,807	16,514	17,095	17,872	18,503
405	Gas Used to Replace Oil (Annual)		0	0	0	0	0	0	0	0	0	0	0
406	Gas Used to Replace Oil (Cummulative)		180,982	180,982	180,982	180,982	180,982	180,982	180,982	180,982	180,982	180,982	180,982
407													
408	Gas Savings – District Heating		15,513	15,358	15,204	15,052	14,901	14,752	14,605	14,459	14,314	14,171	14,029
409	Gas Savings – R/C + ind surplus		1,357	0	0	0	0	0	0	0	0	0	144
410	Total Gas Savings – DH, R/C,ind surplus		16,870	15,358	15,204	15,052	14,901	14,752	14,605	14,459	14,314	14,171	14,173
411	50% of Gas Avail for Oil Displacement		8,435	7,679	7,602	7,526	7,451	7,376	7,302	7,229	7,157	7,086	7,086
412	Oil Consumption – District Heating		289,692	278,354	267,880	257,589	247,479	237,547	227,790	218,207	208,794	199,550	190,471
413	Gas Used to Replace Oil (Annual)		8,435	7,679	7,602	7,526	7,451	7,376	7,302	7,229	7,157	7,086	7,086
414	Gas Used to Replace Oil (Cummulative)		111,575	119,253	126,855	134,381	141,832	149,208	156,511	163,740	170,897	177,983	185,069
415													
416	Volgograd												
417	Gas Savings – Industrial		0	0	0	0	0	0	0	0	0	0	0
418	50% of Gas Avail for Oil Displacement		0	0	0	0	0	0	0	0	0	0	0
419	Oil Consumption – Industrial		73,006	76,107	78,773	81,892	84,684	88,313	91,288	95,369	98,724	103,212	106,856
420	Gas Used to Replace Oil (Annual)		0	0	0	0	0	0	0	0	0	0	0
421	Gas Used to Replace Oil (Cummulative)		315,885	315,885	315,885	315,885	315,885	315,885	315,885	315,885	315,885	315,885	315,885
422													

GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

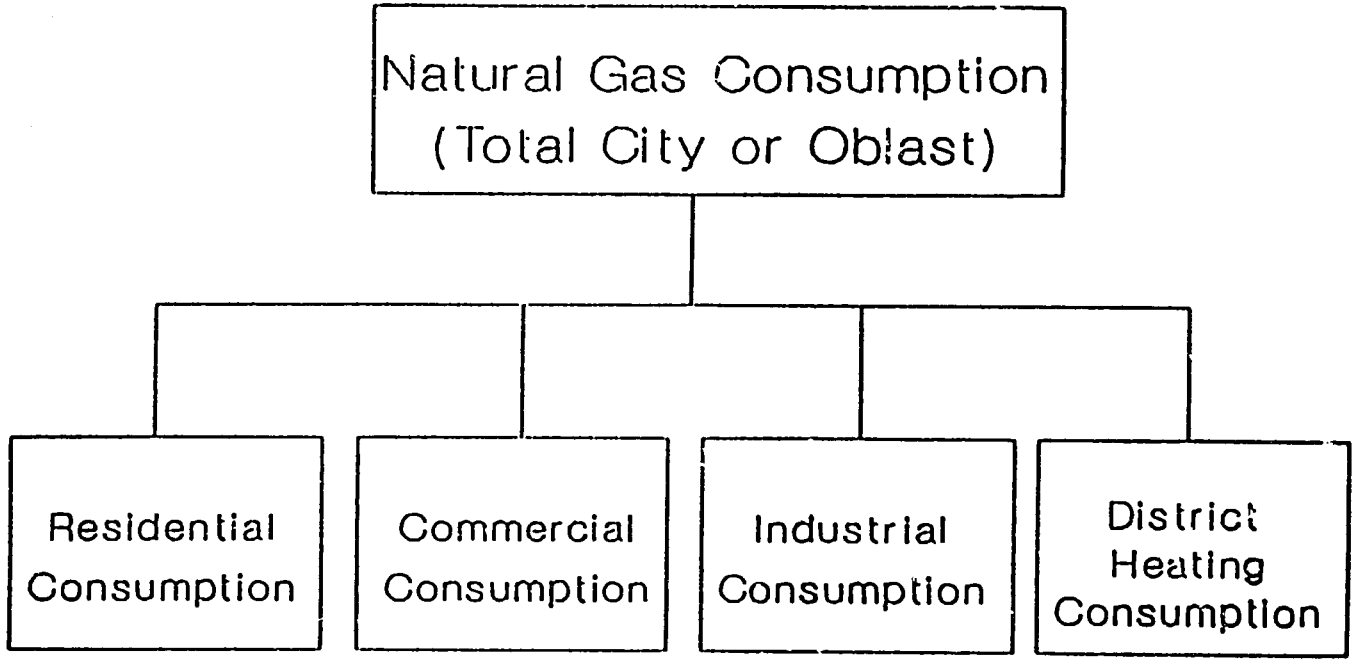
Benjamin Schlesinger and Associates, Inc.

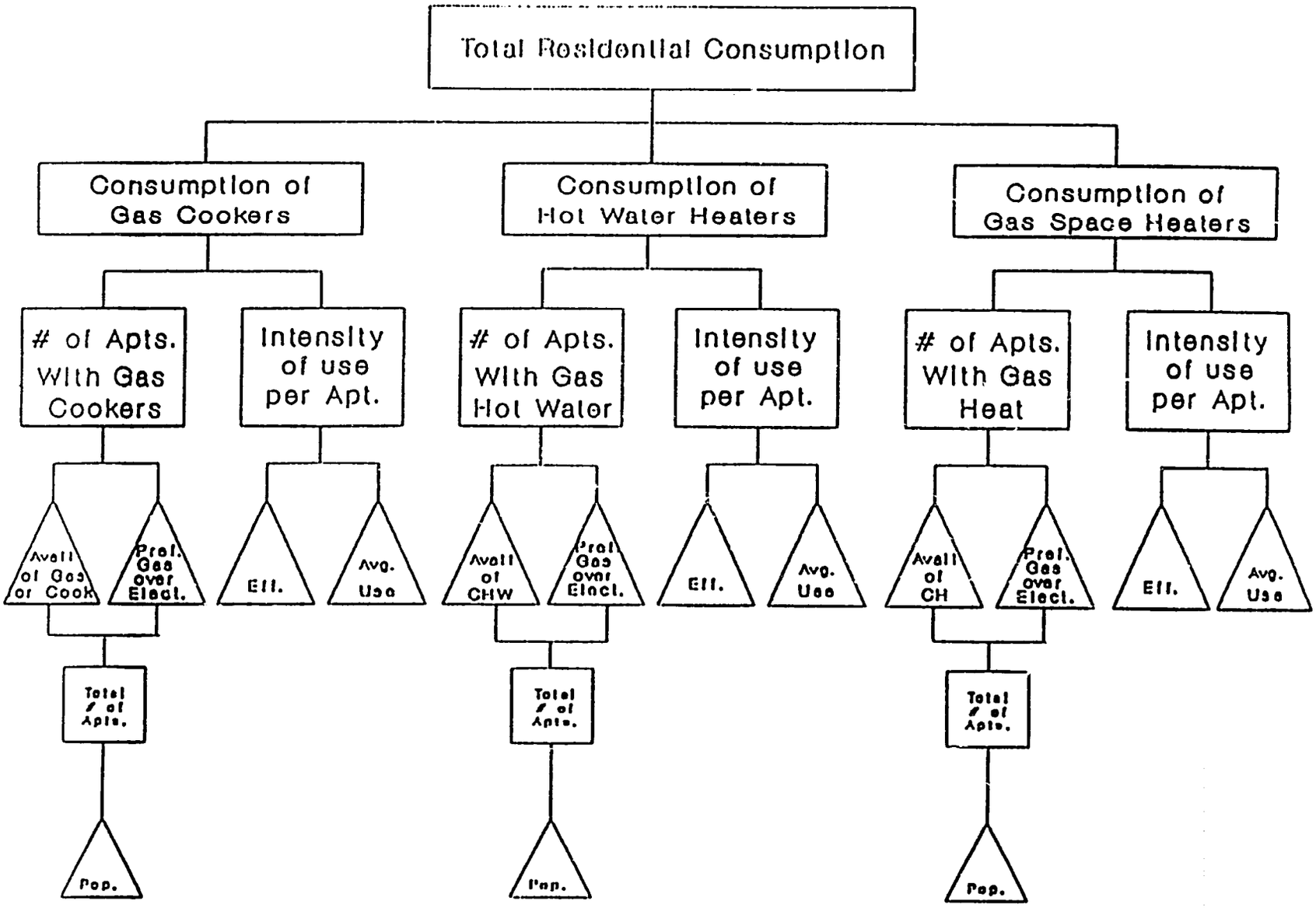
	DESCRIPTION / VARIABLE	UNITS	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
423	Gas Savings – District Heating						9,691	9,594	31,648	9,403	9,309	9,216	9,124
424	Gas Savings – R/C + ind surplus						20,001	10,148	99,186	0	0	0	0
425	Total Gas Savings – DH, R/C,Ind surplus						29,692	19,742	130,834	9,403	9,309	9,216	9,124
426	50% of Gas Avail for Oil Displacement						14,846	9,871	65,417	4,702	4,655	4,608	4,562
427	Oil Consumption – District Heating						876,284	852,824	814,885	741,773	729,521	717,439	705,526
428	Gas Used to Replace Oil (Annual)						14,846	9,871	65,417	4,702	4,655	4,608	4,562
429	Gas Used to Replace Oil (Cummulative)						14,846	24,717	90,134	94,835	99,490	104,098	108,660
430													
431	Voronezh												
432	Gas Savings – Industrial						323,256	327,772	43,995	0	0	0	0
433	50% of Gas Avail for Oil Displacement						161,628	163,886	21,997	0	0	0	0
434	Oil Consumption – Industrial						516,600	298,666	131,370	114,721	118,900	125,216	130,522
435	Gas Used to Replace Oil (Annual)						161,628	163,886	21,997	0	0	0	0
436	Gas Used to Replace Oil (Cummulative)						161,625	325,514	347,512	347,512	347,512	347,512	347,512
437													
438	Gas Savings – District Heating						11,480	11,365	43,292	11,094	10,983	10,873	10,764
439	Gas Savings – R/C + ind surplus						17,047	8,691	24,839	0	0	0	0
440	Total Gas Savings – DH, R/C,Ind surplus						28,527	20,056	68,130	11,094	10,983	10,873	10,764
441	50% of Gas Avail for Oil Displacement						14,264	10,028	34,065	5,547	5,491	5,436	5,382
442	Oil Consumption – District Heating						140,222	124,699	110,259	75,412	69,149	63,004	56,977
443	Gas Used to Replace Oil (Annual)						14,264	10,028	34,065	5,347	5,491	5,436	5,382
444	Gas Used to Replace Oil (Cummulative)						14,264	24,292	58,357	63,904	69,395	74,831	80,213
445													
446	GAS CONSUMPTION BY SECTOR												
447	Ryazan												
448	Residential		100,394	101,984	102,933	103,062	103,440	100,677	97,828	94,923	91,970	88,932	85,974
449	Commercial		134,000	134,000	134,000	134,000	130,191	129,142	97,664	99,893	102,022	104,049	105,971
450	Industrial		660,200	658,400	629,300	572,700	533,965	494,688	488,010	507,733	523,144	546,436	566,002
451	District Heating		1,306,700	1,399,600	1,383,800	1,342,400	1,338,904	1,334,165	1,327,909	1,321,769	1,315,767	1,309,898	1,304,154
452	Total		2,201,294	2,293,984	2,250,033	2,155,162	2,106,499	2,058,672	2,011,413	2,024,318	2,032,903	2,049,365	2,062,101
453	Saratov												
454	Residential		219,825	220,115	222,504	222,265	216,676	210,817	204,805	198,692	192,495	188,236	179,941
455	Commercial		288,728	286,907	263,594	284,805	276,709	274,480	264,517	271,701	278,712	285,545	292,194
456	Industrial		1,061,436	1,106,399	1,072,717	1,026,469	957,042	886,645	845,487	877,981	903,372	941,747	973,984
457	District Heating		1,884,930	1,847,399	1,805,323	1,671,800	1,670,095	1,665,864	1,638,045	1,629,970	1,621,977	1,614,063	1,606,228
458	Total		3,454,919	3,460,820	3,164,138	3,205,159	3,120,522	3,037,806	2,952,853	2,978,345	2,996,555	3,027,590	3,052,347
459	Volgograd												
460	Residential		235,787	238,125	238,597	239,706	233,660	227,355	220,893	214,325	207,670	200,952	194,197
461	Commercial		441,900	440,400	455,500	490,900	476,945	473,103	380,379	389,515	398,302	406,729	414,788
462	Industrial		2,333,000	2,269,300	2,185,500	1,986,800	1,852,420	1,716,162	1,670,915	1,737,177	1,788,953	1,867,206	1,932,941
463	District Heating		886,900	938,100	891,600	969,100	974,255	974,532	1,000,301	1,003,599	998,944	994,336	989,774
464	Total		3,897,587	3,885,925	3,771,197	3,686,506	3,537,280	3,391,152	3,280,488	3,344,616	3,393,669	3,469,223	3,531,700
465	Voronezh												
466	Residential		281,807	285,081	293,855	305,375	301,081	295,902	290,184	284,106	277,731	271,138	264,419
467	Commercial		423,018	444,633	442,371	448,625	435,872	432,360	413,240	424,409	435,303	445,914	456,233
468	Industrial		N/A	N/A	N/A	2,389,657	2,228,029	2,064,143	2,042,145	2,125,014	2,189,766	2,287,631	2,369,841
469	District Heating		N/A	N/A	N/A	1,148,000	1,150,784	1,149,446	1,140,220	1,134,673	1,129,182	1,123,745	1,118,363
470	Total		N/A	N/A	N/A	4,291,657	4,115,766	3,941,851	3,885,789	3,968,202	4,031,982	4,128,428	4,208,857

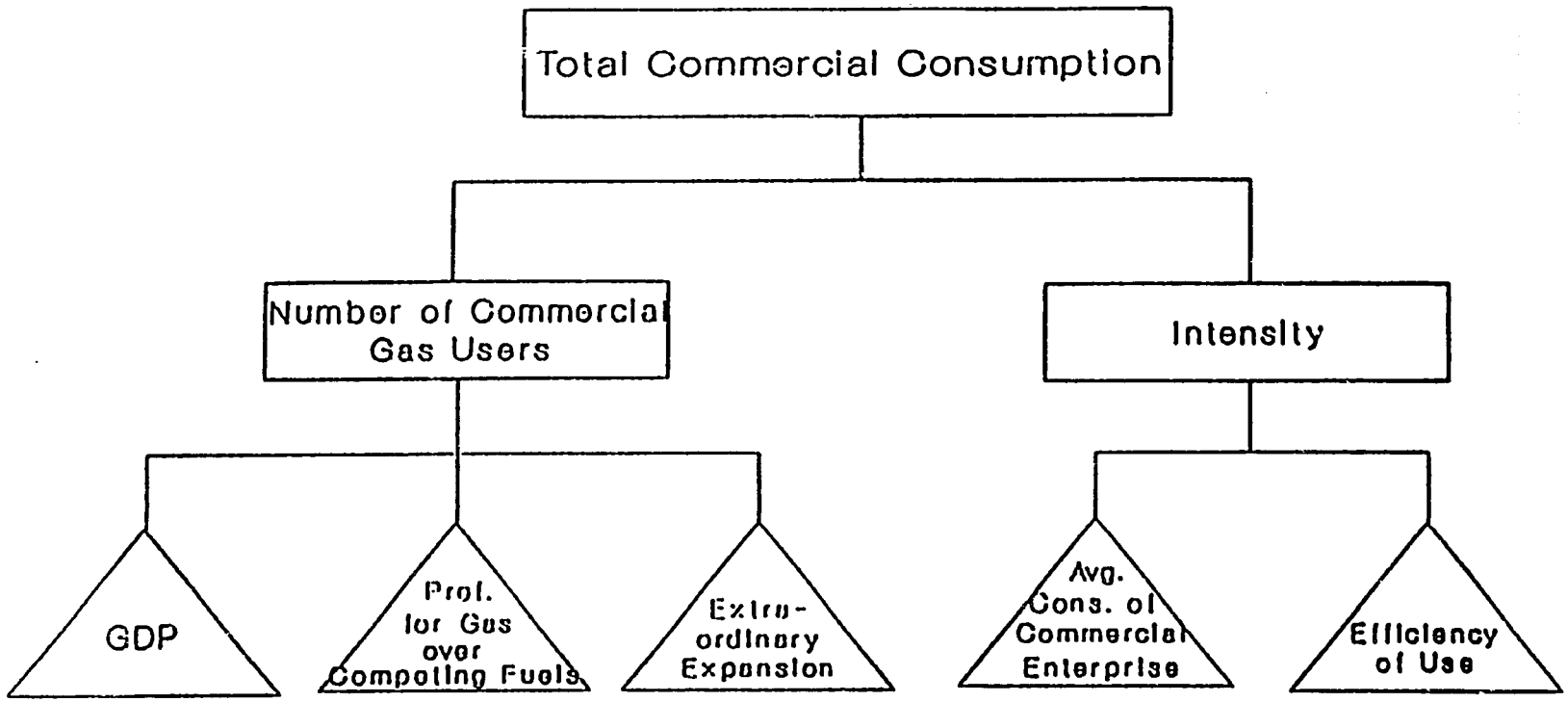
GAS DEMAND FORECAST MODEL – CITIES OF RYAZAN, SARATOV, AND VOLGOGRAD AND OBLAST OF VORONEZH

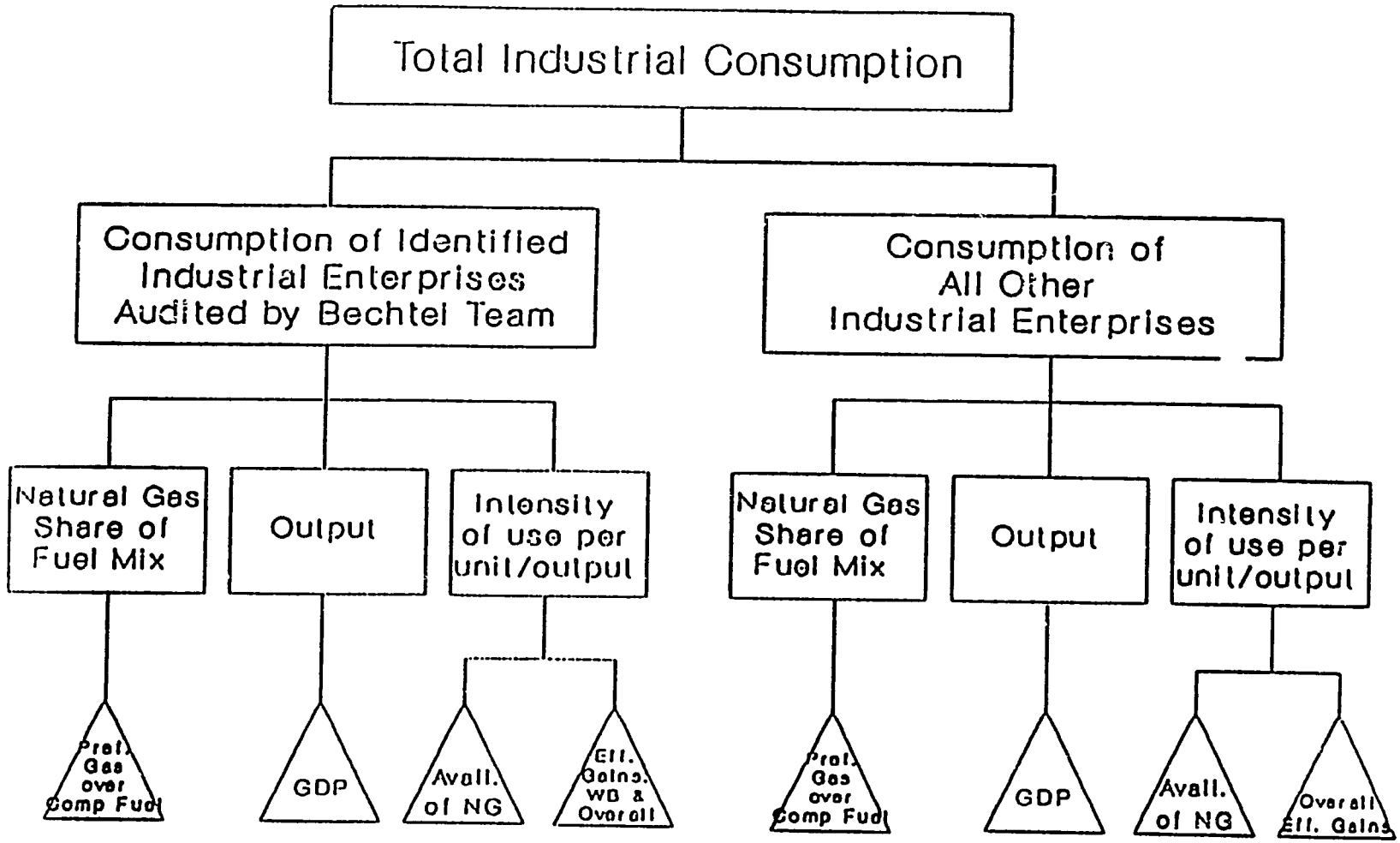
Benjamin Schlesinger and Associates, Inc.

	DESCRIPTION / VARIABLE	UNITS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
423	Gas Savings – District Heating		9,033	8,942	8,853	8,764	8,677	8,590	8,504	8,419	8,335	8,251	8,169
424	Gas Savings – R/C + ind surplus		1,221	0	0	0	0	0	0	307	847	1,427	2,038
425	Total Gas Savings – DH, R/C,Ind surplus		10,253	8,942	8,853	8,764	8,677	8,590	8,504	8,726	9,182	9,678	10,207
426	50% of Gas Avail for Oil Displacement		5,127	4,471	4,426	4,382	4,338	4,295	4,252	4,363	4,591	4,839	5,103
427	Oil Consumption – District Heating		693,778	681,590	670,174	658,917	647,818	636,875	626,085	615,446	604,806	594,047	583,151
428	Gas Used to Replace Oil (Annual)		5,127	4,471	4,426	4,382	4,338	4,295	4,252	4,363	4,591	4,839	5,103
429	Gas Used to Replace Oil (Cummulative)		113,787	118,258	122,684	127,068	131,405	135,700	139,952	144,315	148,906	153,745	158,848
430													
431	Voronezh												
432	Gas Savings – Industrial		0	0	0	0	0	0	0	0	0	0	0
433	50% of Gas Avail for Oil Displacement		0	0	0	0	0	0	0	0	0	0	0
434	Oil Consumption – Industrial		133,534	139,205	144,083	149,786	154,894	161,532	166,973	174,437	180,573	188,782	195,448
435	Gas Used to Replace Oil (Annual)		0	0	0	0	0	0	0	0	0	0	0
436	Gas Used to Replace Oil (Cummulative)		347,512	347,512	347,512	347,512	347,512	347,512	347,512	347,512	347,512	347,512	347,512
437													
438	Gas Savings – District Heating		10,656	10,550	10,444	10,340	10,237	10,134	10,033	9,933	9,833	9,735	9,638
439	Gas Savings – R/C + ind surplus		0	0	0	0	0	0	0	0	0	0	0
440	Total Gas Savings – DH, R/C,Ind surplus		10,656	10,550	10,444	10,340	10,237	10,134	10,033	9,933	9,833	9,735	9,638
441	50% of Gas Avail for Oil Displacement		5,328	5,275	5,222	5,170	5,118	5,067	5,016	4,966	4,917	4,867	4,819
442	Oil Consumption – District Heating		51,000	45,268	39,582	34,007	28,540	23,181	17,928	12,779	7,732	2,787	0
443	Gas Used to Replace Oil (Annual)		5,328	5,275	5,222	5,170	5,118	5,067	5,016	4,966	4,917	2,787	0
444	Gas Used to Replace Oil (Cummulative)		85,542	90,817	96,039	101,209	106,327	111,394	116,411	121,377	126,294	129,080	129,080
445													
446	GAS CONSUMPTION BY SECTOR												
447	Ryazan												
448	Residential		82,954	82,159	81,360	80,561	79,763	78,959	78,137	77,286	76,391	75,436	74,408
449	Commercial		107,244	108,403	109,446	110,371	111,176	111,859	112,418	112,851	113,155	113,328	113,369
450	Industrial		577,108	598,023	616,009	637,041	655,876	680,354	700,419	727,843	750,571	780,841	805,424
451	District Heating		1,298,804	1,292,643	1,286,544	1,280,505	1,274,527	1,268,669	1,262,941	1,257,350	1,251,902	1,246,608	1,241,473
452	Total		2,066,111	2,081,228	2,093,359	2,108,478	2,121,342	2,139,841	2,153,915	2,175,429	2,192,019	2,216,213	2,234,674
453	Saratov												
454	Residential		173,625	171,309	168,988	166,665	164,344	162,012	159,649	157,234	154,742	152,142	149,412
455	Commercial		297,154	301,695	306,413	310,705	314,765	318,591	322,177	325,520	328,615	331,458	334,045
456	Industrial		992,283	1,026,741	1,056,374	1,091,026	1,122,060	1,162,389	1,195,447	1,240,796	1,278,076	1,327,949	1,368,451
457	District Heating		1,599,150	1,591,471	1,583,869	1,576,343	1,568,893	1,561,516	1,554,214	1,546,985	1,539,827	1,532,742	1,525,799
458	Total		3,062,211	3,091,416	3,115,644	3,144,739	3,170,061	3,204,508	3,231,487	3,270,534	3,301,261	3,344,291	3,377,706
459	Volgograd												
460	Residential		187,418	184,668	181,911	179,153	176,397	173,631	170,851	187,978	165,045	162,000	158,821
461	Commercial		420,346	425,495	430,229	434,541	438,422	441,866	444,865	447,411	449,497	451,115	452,258
462	Industrial		1,970,256	2,040,522	2,100,948	2,171,610	2,234,592	2,317,129	2,384,540	2,477,014	2,553,035	2,654,734	2,737,323
463	District Heating		985,868	981,397	976,971	972,589	968,250	963,955	959,703	955,647	951,904	948,491	945,428
464	Total		3,563,888	3,632,083	3,690,060	3,757,893	3,817,961	3,896,581	3,959,940	4,048,050	4,119,480	4,218,340	4,293,825
465	Voronezh												
466	Residential		257,920	255,981	254,320	252,654	250,995	249,300	247,492	245,499	243,235	240,590	237,484
467	Commercial		463,910	471,241	478,220	484,840	491,095	496,978	502,483	507,602	512,331	516,660	520,584
468	Industrial		2,416,503	2,504,385	2,579,955	2,668,327	2,747,468	2,850,316	2,934,622	3,050,272	3,145,346	3,272,533	3,375,820
469	District Heating		1,113,035	1,107,760	1,102,538	1,097,368	1,092,250	1,087,183	1,082,166	1,077,200	1,072,283	1,065,335	1,055,697
470	Total		4,251,074	4,339,367	4,415,034	4,503,189	4,581,807	4,683,777	4,766,763	4,880,573	4,973,194	5,095,117	5,189,585


Natural Gas Consumption
(Total City or Oblast)
Residential Consumption
Commercial Consumption
Industrial Consumption
District Heating Consumption


Total Residential Consumption
Consumption of Gas Cookers
Consumption of Hot Water Heaters
Consumption of Gas Space Heaters
# of Apts. With Gas Cookers
Intensity of use per Apt.
# of Apts. With Gas Hot Water
Intensity of use per Apt.
# of Apts. With Gas Heat
Intensity of use per Apt.
Avail of Gas for Cook
Pref. Gas over Elect.
Eff.
Avg. Use
Avail of CHW
Pref. Gas over Elect.
Eff.
Avg. Use
Avail of CH
Pref. Gas over Elect.
Eff.
Avg. Use
Total # of Apts.
Total # of Apts.
Total # of Apts.
Pop.
Pop.
Pop.


Total Commercial Consumption
Number of Commercial Gas Users
Intensity
GDP
Prof. for Gas over Competing Fuels
Extra-ordinary Expansion
Avg. Cons. of Commercial Enterprise
Efficiency of Use


Total Industrial Consumption
Consumption of Identified Industrial Enterprises Audited by Bechtel Team
Consumption of All Other Industrial Enterprises
Natural Gas Share of Fuel Mix
Output
Intensity of use per unit/output
Natural Gas Share of Fuel Mix
Output
Intensity of use per unit/output
Prat. Gas over Comp Fuel
GDP
Avail. of NG
Ell. Gains. WB & Overall
Prat. Gas over Comp Fuel
GDP
Avail. of NG
Overall Ell. Gains

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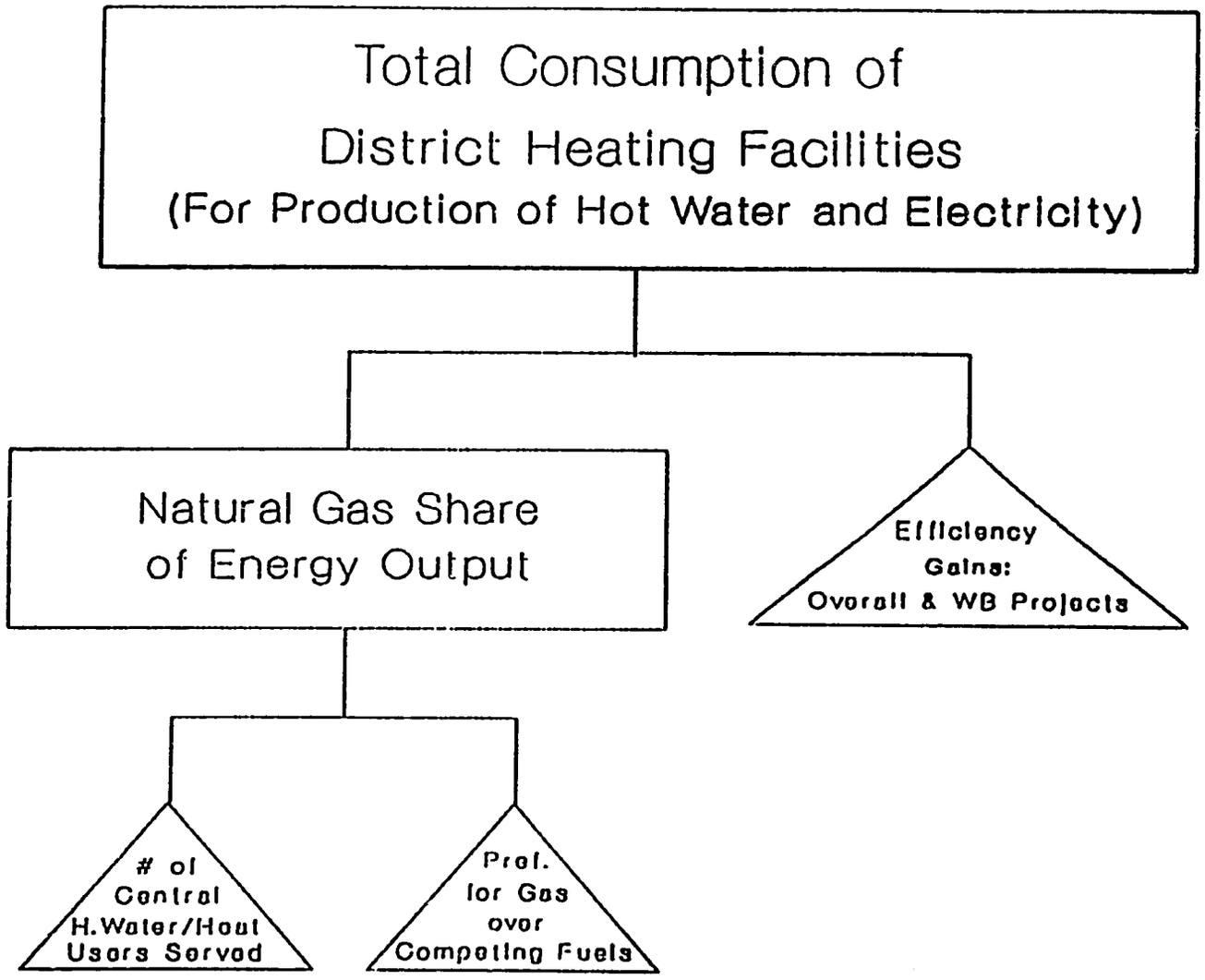
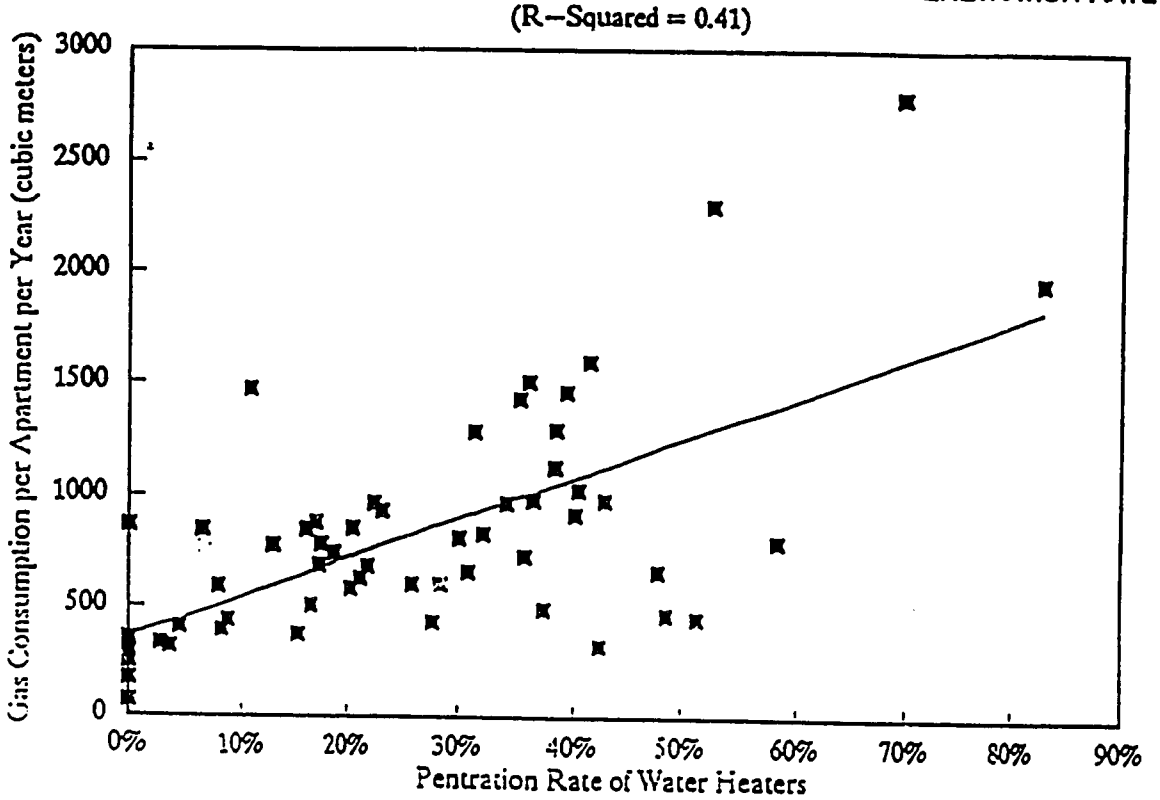
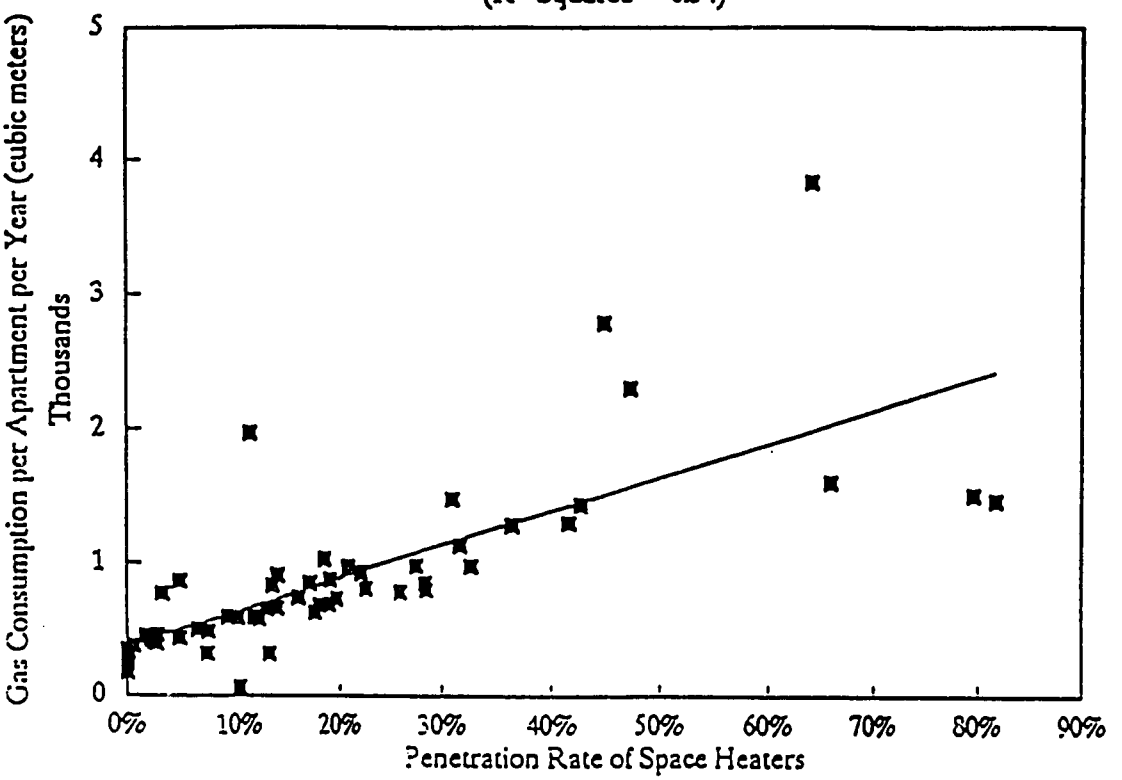

Total Consumption of
District Heating Facilities
(For Production of Hot Water and Electricity)
Natural Gas Share
of Energy Output
Efficiency
Gains:
Overall & WB Projects
of
Central
H.Water/Heat
Users Served
Pref.
for Gas
over
Competing Fuels

CORRELATION BETWEEN GAS CONSUMPTION & GAS WATER HEATER PENETRATION RATE
(R–Squared = 0.41)



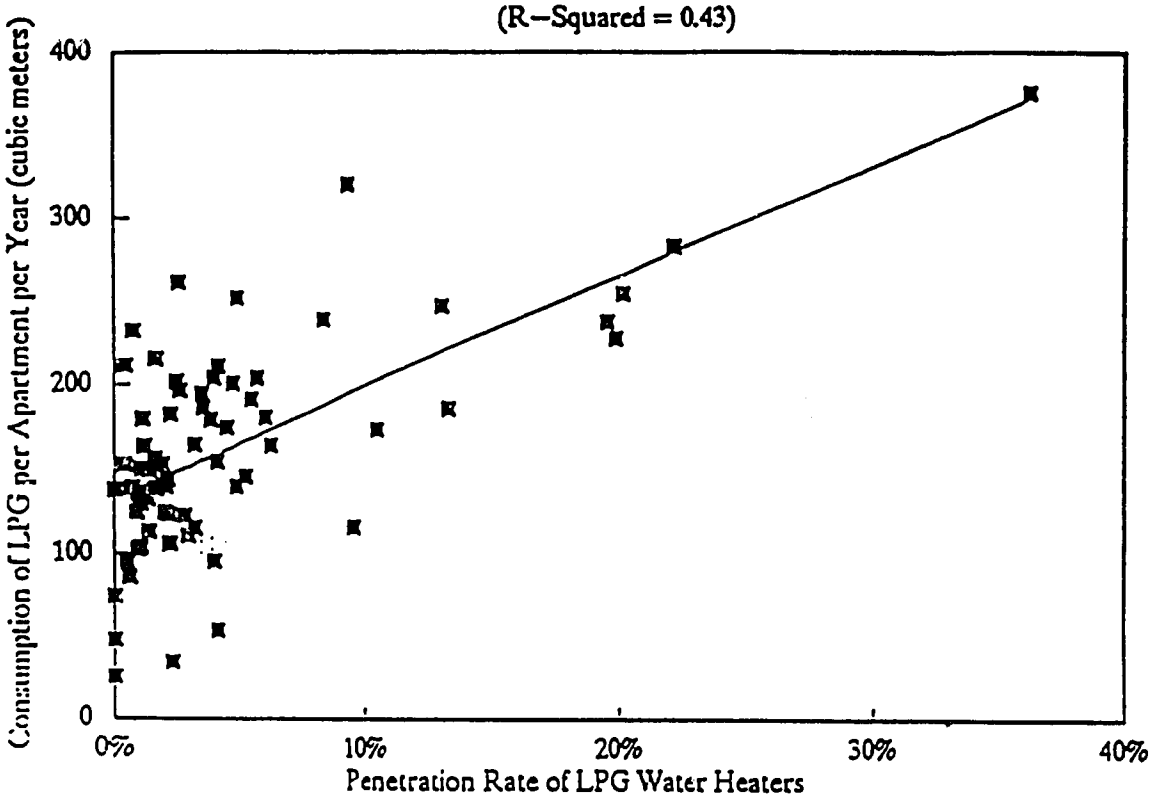
Source: BSA, Inc.; Giproniigas Technical Passport 1991

CORRELATION BETWEEN GAS CONSUMPTION & GAS SPACE HEAT PENETRATION RATI
(R–Squared = 0.54)



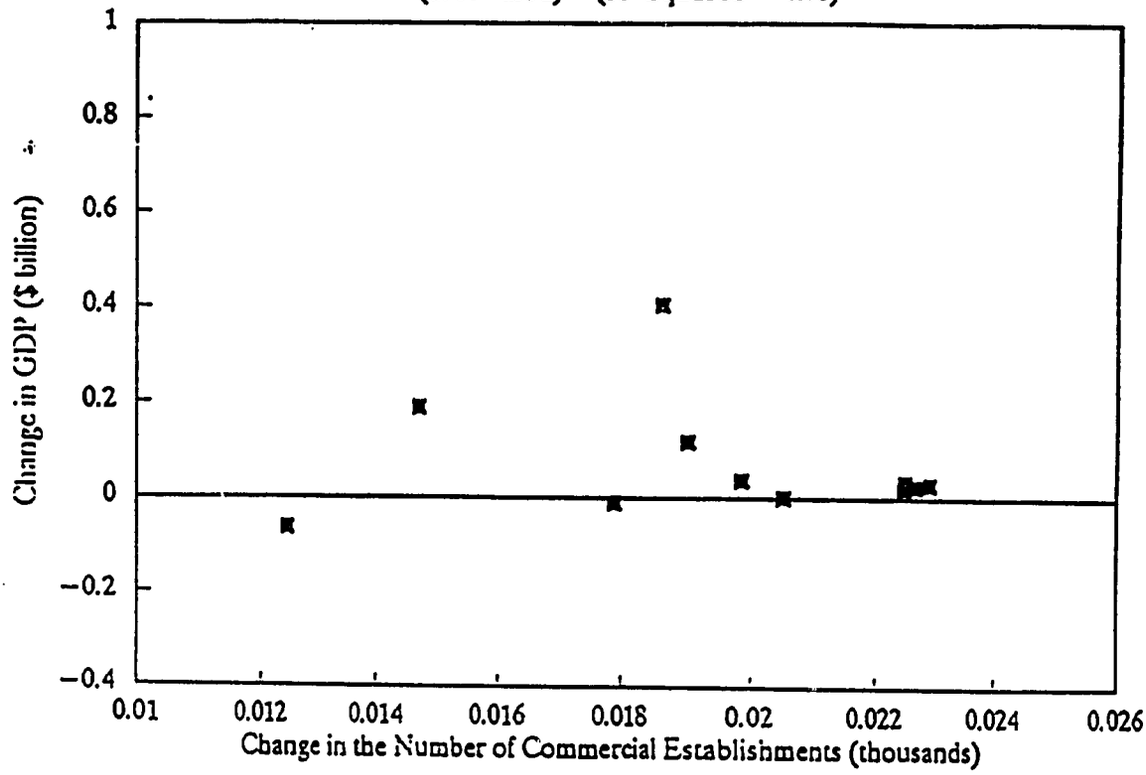
Source: BSA, Inc.; Giproniigas Technical Passport 1991

CORRELATION BETWEEN LPG CONSUMPTION & LPG WATER HEATER PENETRATION RATE
(R–Squared = 0.43)



Source: BSA, Inc.; Giproniigas Technical Passport 1991

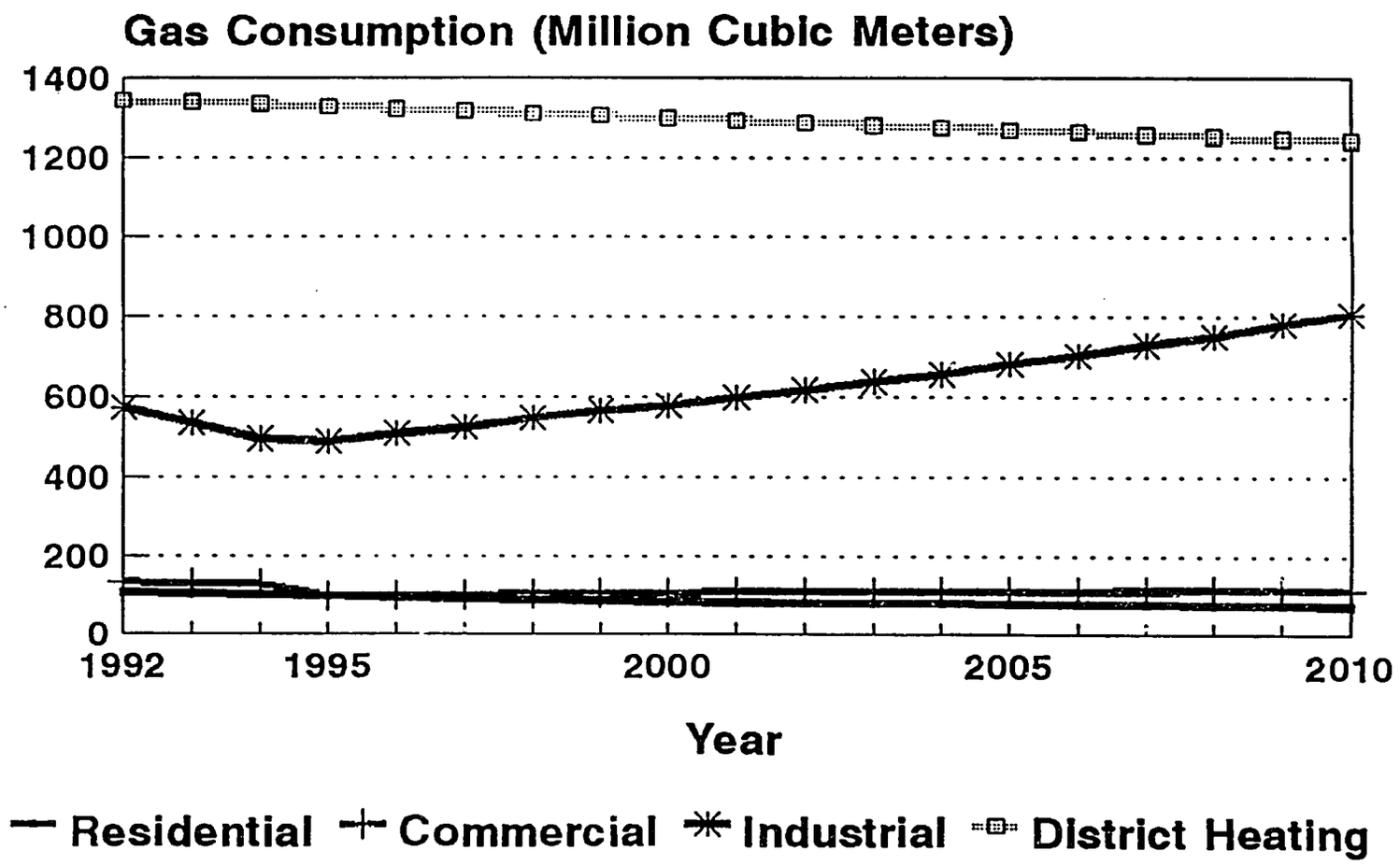
CORRELATION BETWEEN U.S. GDP & NUMBER OF COMMERCIAL ESTABLISHMENTS
(1980–1991) (R–Squared = 0.78)



Source: BSA, Inc.

RYAZAN: PROJECTED NATURAL GAS DEMAND COMPARISON BY SECTOR

SCENARIO 2 (BASE CASE)



Source: BSA, Inc.

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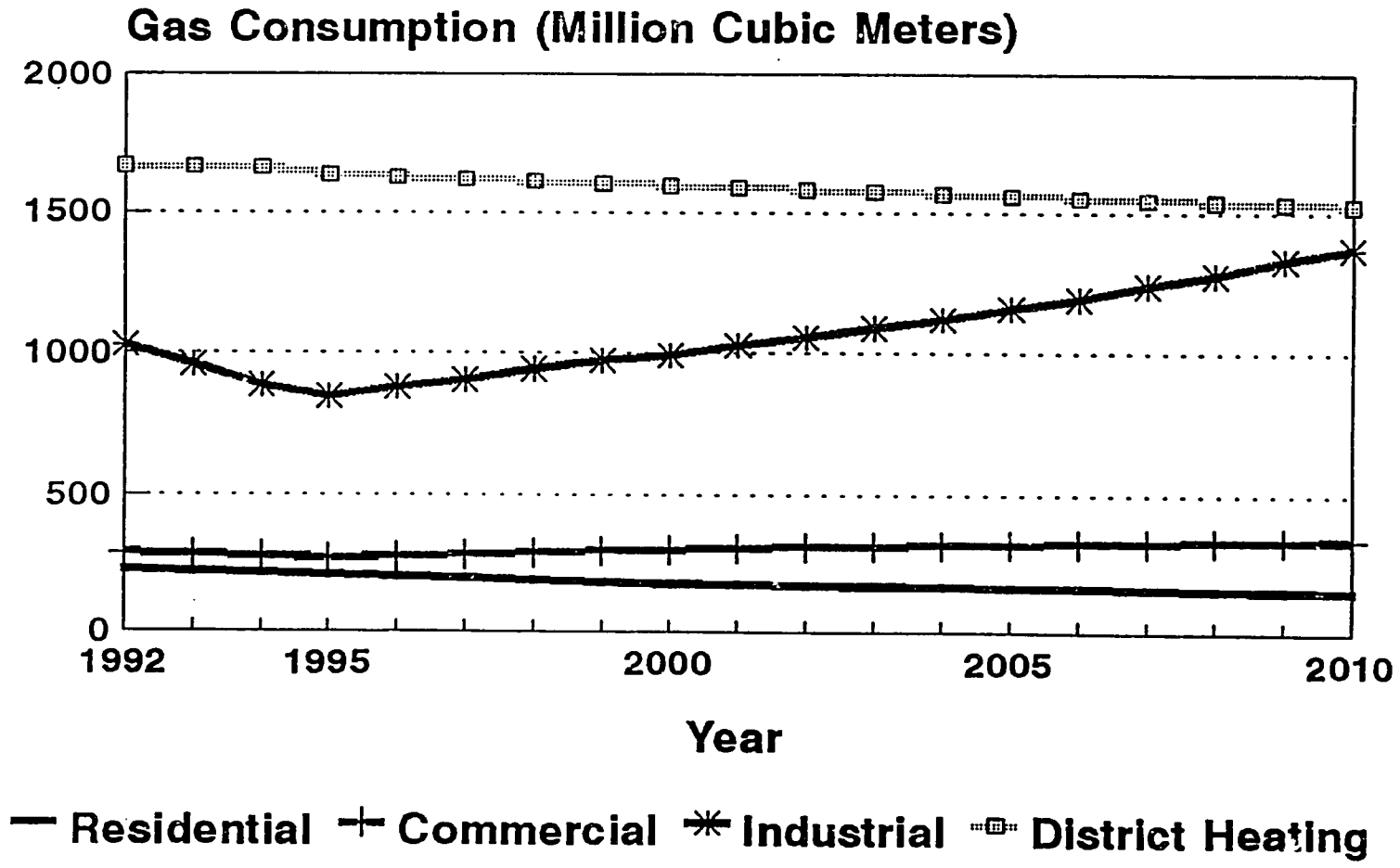
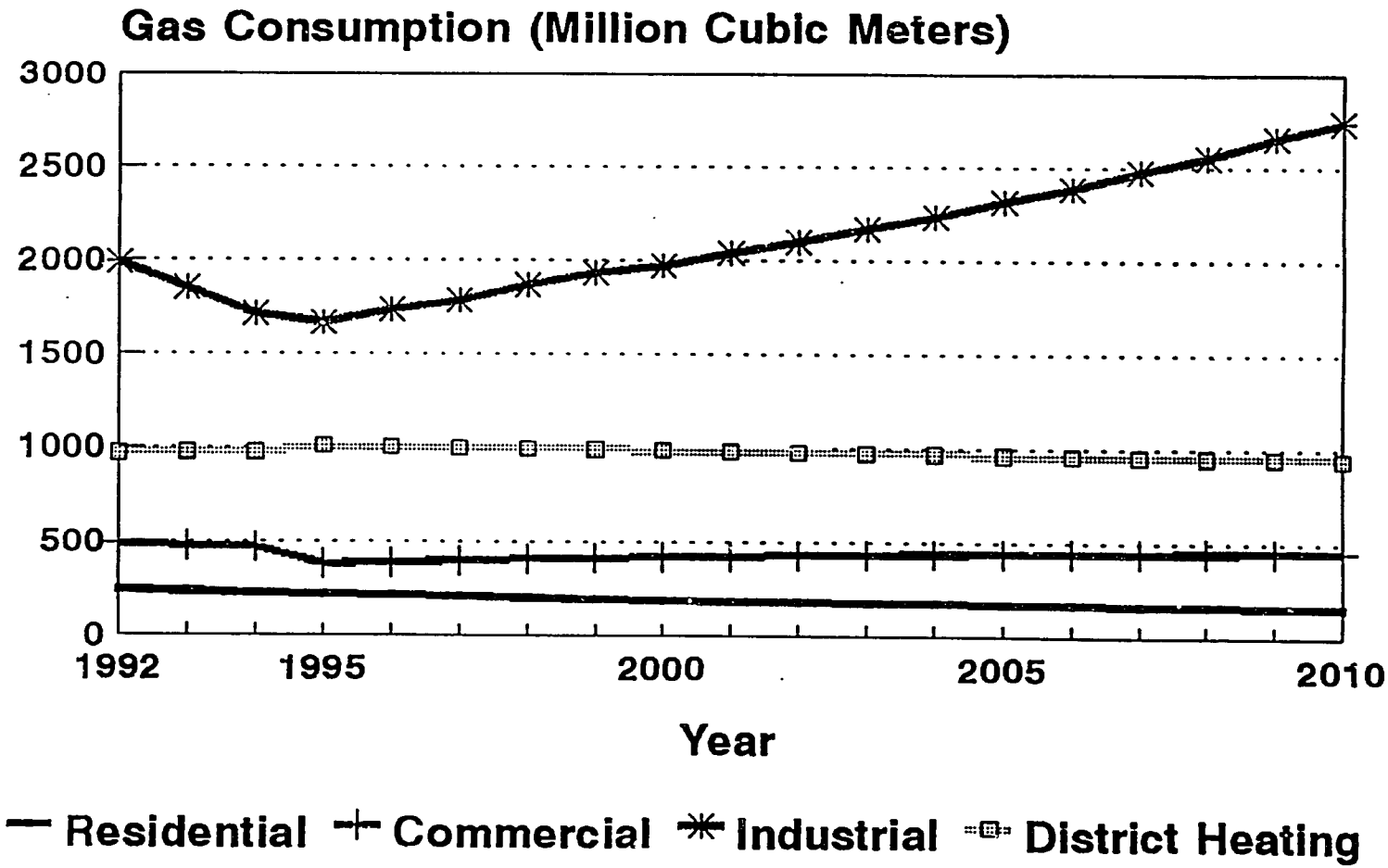
SARATOV: PROJECTED NATURAL GAS DEMAND
COMPARISON BY SECTOR
SCENARIO 2 (BASE CASE)



Source: BSA, Inc.

VOLGOGRAD: PROJECTED NATURAL GAS DEMAND COMPARISON BY SECTOR

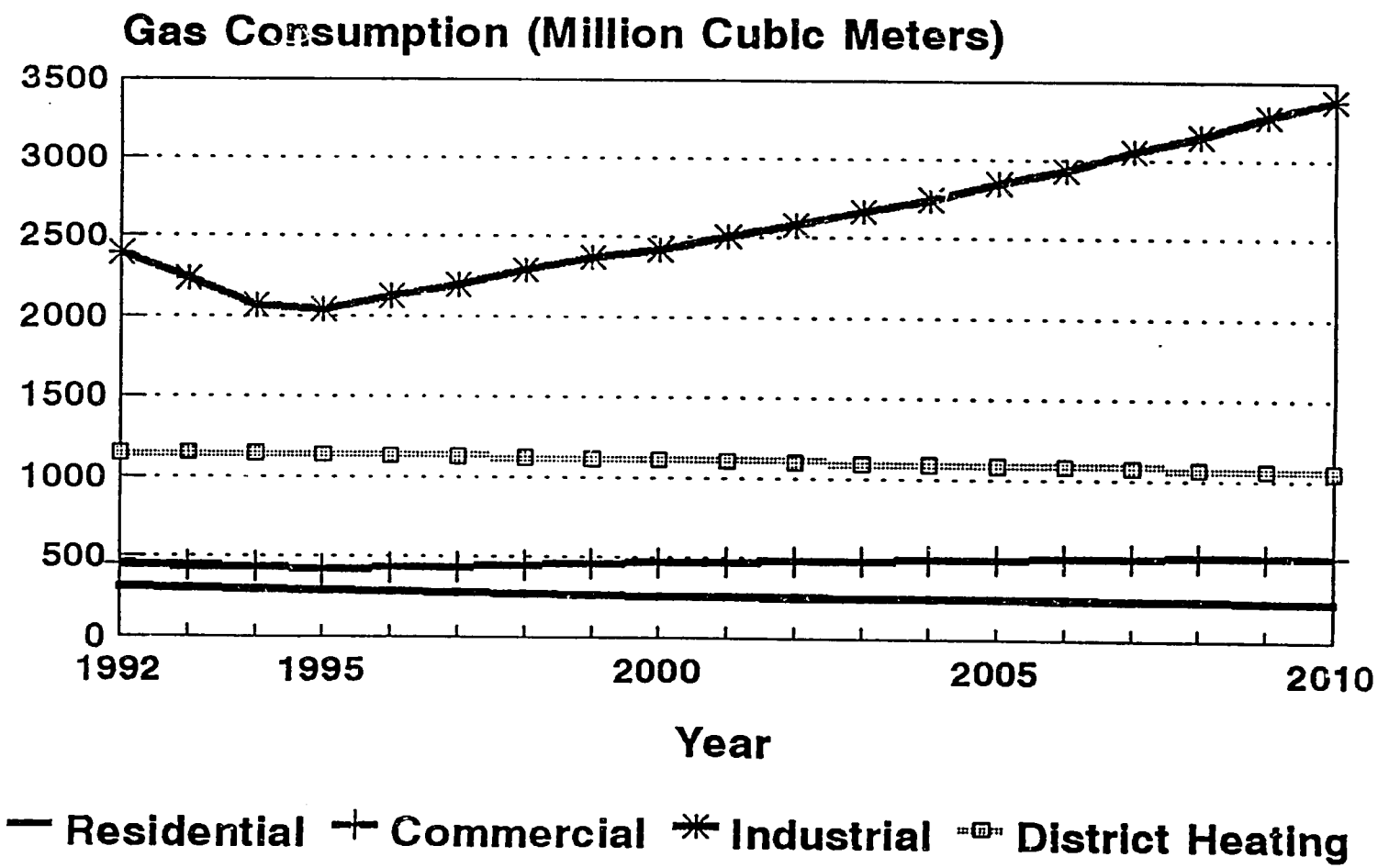
SCENARIO 2 (BASE CASE)



Source: BSA, Inc.

VORONEZH: PROJECTED NATURAL GAS DEMAND COMPARISON BY SECTOR

SCENARIO 2 (BASE CASE)

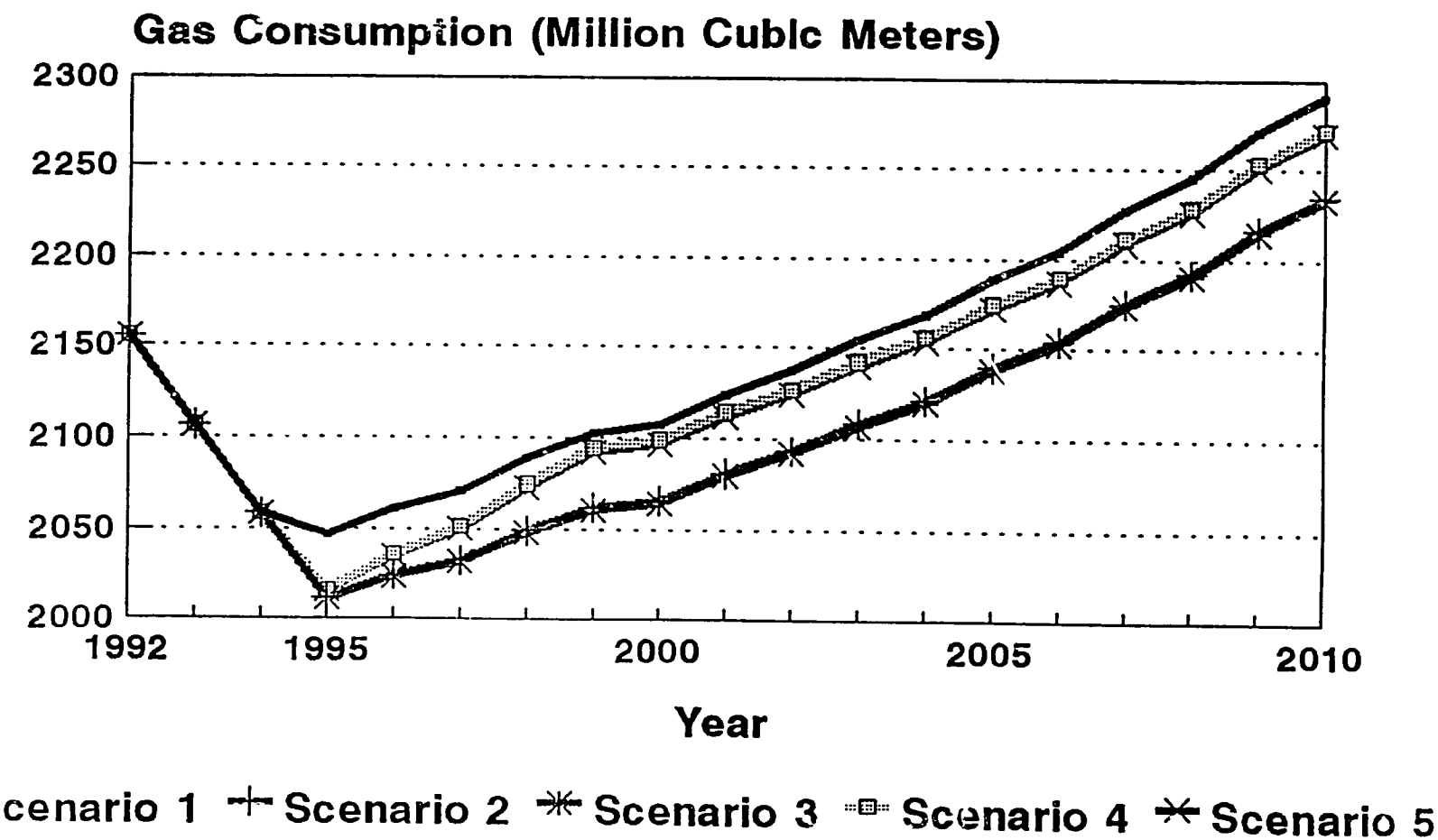


Source: BSA, Inc.

4

RYAZAN: PROJECTED TOTAL NATURAL GAS DEMAND

COMPARISON BY SCENARIO

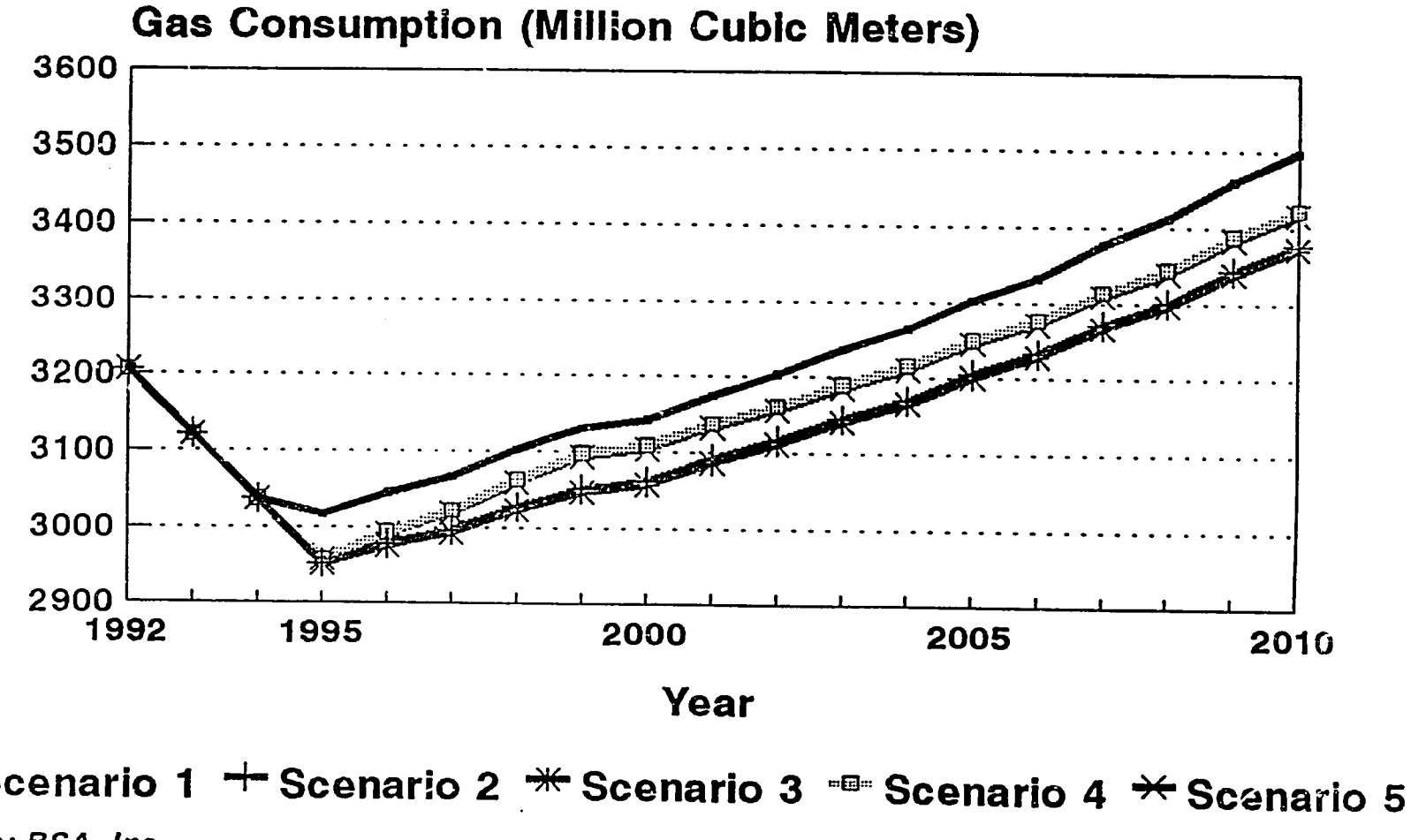


Source: BSA, Inc.

41

SARATOV: PROJECTED TOTAL NATURAL GAS DEMAND

COMPARISON BY SCENARIO



Source: BSA, Inc.

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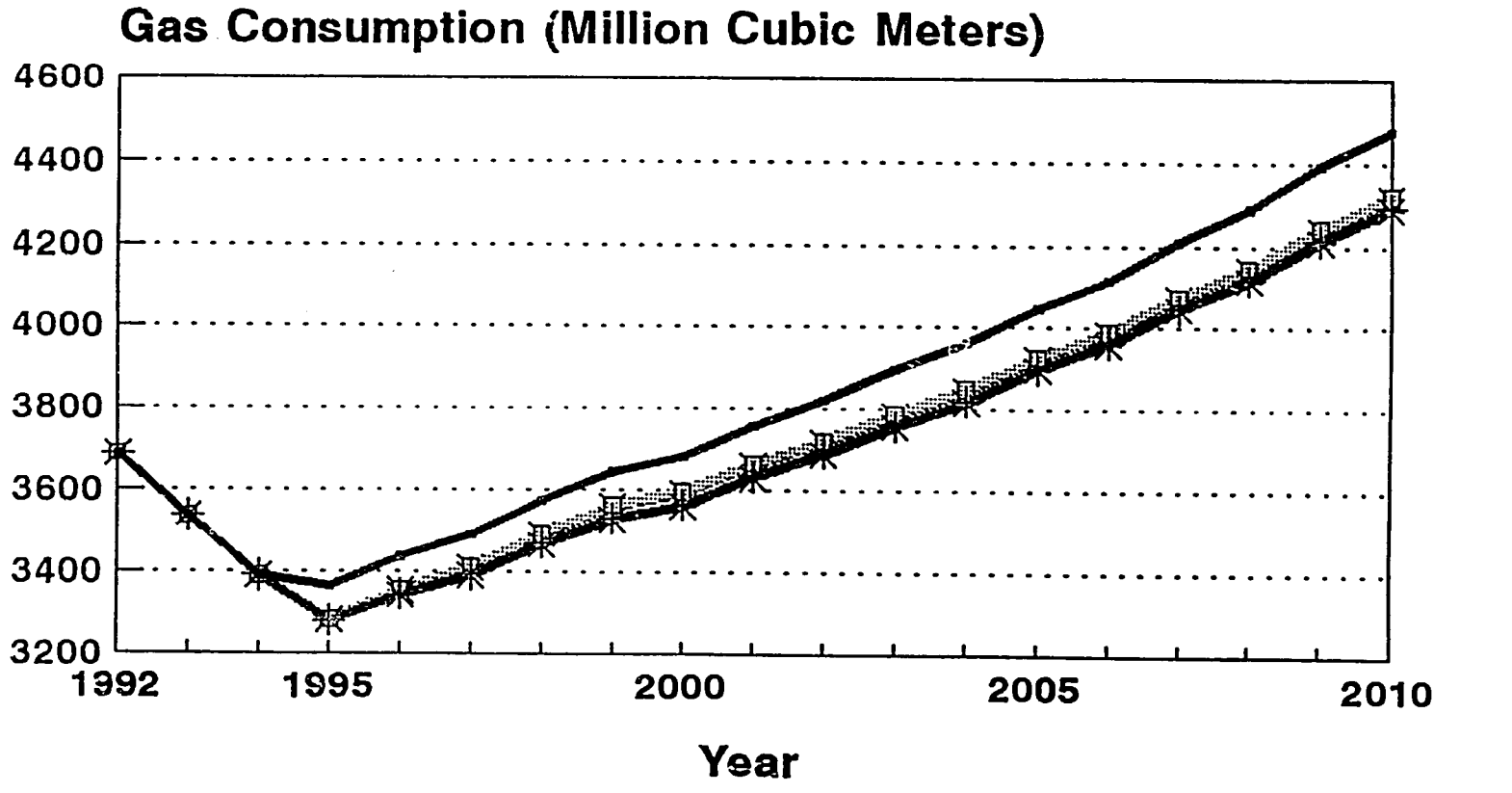
VOLGOGRAD: PROJECTED TOTAL NATURAL GAS DEMAND

COMPARISON BY SCENARIO

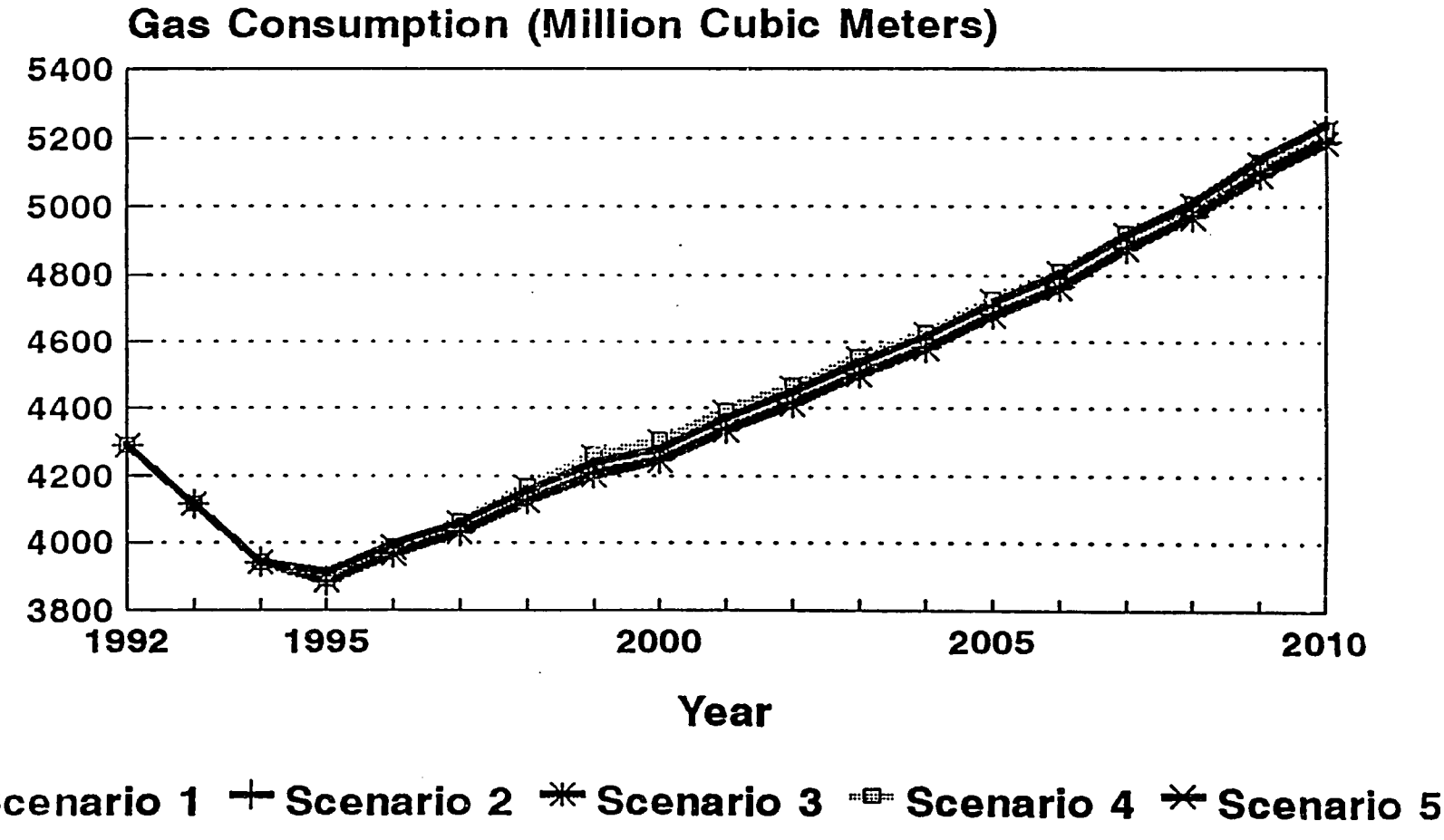


Scenario 1 Scenario 2 Scenario 3 Scenario 4 Scenario 5

Source: BSA, Inc.

VORONEZH: PROJECTED TOTAL NATURAL GAS DEMAND

COMPARISON BY SCENARIO



Source: BSA, Inc.

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RYAZAN – SCENARIO 1 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	100,394	134,000	660,200	1,306,700	2,201,294
1990	101,984	134,000	658,400	1,399,600	2,293,984
1991	102,933	134,000	629,300	1,383,800	2,250,033
1992	106,062	134,000	572,700	1,342,400	2,155,162
1993	103,440	130,191	533,965	1,338,904	2,106,499
1994	100,677	129,142	494,688	1,334,165	2,058,672
1995	97,828	130,268	490,454	1,328,448	2,046,998
1996	94,923	133,898	510,416	1,321,935	2,061,172
1997	91,970	137,450	526,014	1,315,488	2,070,921
1998	88,982	140,923	549,588	1,309,105	2,088,597
1999	85,974	144,313	569,391	1,302,785	2,102,463
2000	82,954	146,877	580,632	1,296,757	2,107,220
2001	82,159	149,340	601,800	1,290,564	2,123,863
2002	81,360	151,701	620,004	1,284,433	2,137,497
2003	80,561	153,957	641,291	1,278,362	2,154,172
2004	79,763	156,108	660,355	1,272,353	2,168,578
2005	78,959	158,150	685,129	1,266,403	2,188,641
2006	78,137	160,082	705,437	1,260,513	2,204,170
2007	77,286	161,902	733,295	1,254,682	2,227,165
2008	76,391	163,609	756,197	1,248,910	2,245,106
2009	75,436	165,199	786,834	1,243,195	2,270,664
2010	74,408	166,671	811,714	1,237,537	2,290,330

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SARATOV – SCENARIO 1 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	219,825	288,728	1,061,436	1,884,930	3,454,919
1990	220,115	286,907	1,106,399	1,847,399	3,460,820
1991	222,504	263,594	1,072,717	1,605,323	3,164,138
1992	222,285	284,805	1,026,469	1,671,600	3,205,159
1993	216,676	276,709	957,042	1,670,095	3,120,522
1994	210,817	274,480	886,645	1,665,864	3,037,806
1995	204,805	270,467	879,058	1,662,685	3,017,014
1996	198,692	277,907	914,836	1,654,575	3,046,009
1997	192,495	285,178	942,792	1,646,546	3,067,010
1998	186,236	292,274	985,044	1,638,598	3,102,152
1999	179,941	299,191	1,020,538	1,630,729	3,130,399
2000	173,625	304,386	1,040,686	1,623,500	3,142,197
2001	171,309	309,366	1,078,626	1,615,787	3,175,088
2002	168,988	314,124	1,111,253	1,608,152	3,202,517
2003	166,665	318,659	1,149,407	1,600,593	3,235,324
2004	164,344	322,965	1,183,576	1,593,110	3,263,994
2005	162,012	327,039	1,227,980	1,585,702	3,302,732
2006	159,649	330,875	1,264,378	1,578,367	3,333,270
2007	157,234	334,472	1,314,309	1,571,106	3,377,121
2008	154,742	337,823	1,355,357	1,563,918	3,411,839
2009	152,142	340,924	1,410,269	1,556,801	3,460,137
2010	149,412	343,772	1,454,862	1,549,756	3,497,803

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VOLGOGRAD – SCENARIO 1 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	235,787	441,900	2,333,000	886,900	3,897,587
1990	238,125	440,400	2,269,300	938,100	3,885,925
1991	238,597	455,500	2,185,500	891,600	3,771,197
1992	239,706	490,900	1,986,800	969,100	3,686,506
1993	233,660	476,945	1,852,420	974,255	3,537,280
1994	227,355	473,103	1,716,162	974,532	3,391,152
1995	220,893	466,186	1,701,475	976,472	3,365,026
1996	214,325	479,010	1,770,726	971,770	3,435,831
1997	207,670	491,542	1,824,837	967,116	3,491,165
1998	200,952	503,774	1,906,619	962,508	3,573,853
1999	194,197	515,696	1,975,320	957,946	3,643,159
2000	187,418	524,651	2,014,318	953,430	3,679,817
2001	184,668	533,234	2,087,754	948,958	3,754,613
2002	181,911	541,436	2,150,906	944,532	3,818,785
2003	179,153	549,252	2,224,755	940,150	3,893,309
2004	176,397	556,674	2,290,891	935,811	3,959,773
2005	173,631	563,695	2,376,838	931,516	4,045,680
2006	170,831	570,309	2,447,289	927,264	4,115,694
2007	167,978	576,507	2,543,934	923,055	4,211,473
2008	165,045	582,283	2,623,384	918,887	4,289,599
2009	162,000	587,629	2,729,670	914,762	4,394,061
2010	158,821	592,538	2,815,984	910,677	4,478,020

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VORONEZH – SCENARIO 1 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	281,807	423,018	N/A	N/A	N/A
1990	285,081	444,663	N/A	N/A	N/A
1991	293,855	442,371	N/A	N/A	N/A
1992	305,375	448,625	2,389,657	1,148,000	4,291,657
1993	301,081	435,872	2,228,029	1,150,784	4,115,766
1994	295,902	432,360	2,064,143	1,149,446	3,941,851
1995	290,184	426,040	2,046,478	1,149,840	3,912,541
1996	284,106	437,759	2,129,770	1,144,271	3,995,906
1997	277,731	449,212	2,194,853	1,138,757	4,060,553
1998	271,138	460,390	2,293,219	1,133,298	4,158,045
1999	264,419	471,286	2,375,850	1,127,894	4,239,448
2000	257,620	479,470	2,422,755	1,122,544	4,282,389
2001	255,981	487,313	2,511,081	1,117,247	4,371,622
2002	254,320	494,809	2,587,038	1,112,004	4,448,171
2003	252,654	501,952	2,675,861	1,106,813	4,537,280
2004	250,995	508,735	2,755,407	1,101,673	4,616,810
2005	249,300	515,151	2,858,781	1,096,585	4,719,818
2006	247,492	521,195	2,943,518	1,091,549	4,803,754
2007	245,499	526,860	3,059,759	1,086,562	4,918,680
2008	243,235	532,139	3,155,319	1,081,625	5,012,317
2009	240,590	537,024	3,283,156	1,076,738	5,137,508
2010	237,484	541,510	3,386,972	1,071,899	5,237,865

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RYAZAN—SCENARIO 2 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	100,394	134,000	660,200	1,306,700	2,201,294
1990	101,984	134,000	658,400	1,399,600	2,293,984
1991	102,933	134,000	629,300	1,383,800	2,250,033
1992	106,062	134,000	572,700	1,342,400	2,155,162
1993	103,440	130,191	533,965	1,338,904	2,106,499
1994	100,677	129,142	494,688	1,334,165	2,058,672
1995	97,828	97,664	488,010	1,327,909	2,011,413
1996	94,923	99,893	507,733	1,321,769	2,024,318
1997	91,970	102,022	523,144	1,315,767	2,032,903
1998	88,982	104,049	546,436	1,309,898	2,049,365
1999	85,974	105,971	566,002	1,304,154	2,062,101
2000	82,954	107,244	577,108	1,298,804	2,066,111
2001	82,159	108,403	598,023	1,292,643	2,081,228
2002	81,360	109,446	616,009	1,286,544	2,093,359
2003	80,561	110,371	637,041	1,280,505	2,108,478
2004	79,763	111,176	655,876	1,274,527	2,121,342
2005	78,959	111,859	680,354	1,268,669	2,139,841
2006	78,137	112,418	700,419	1,262,941	2,153,915
2007	77,286	112,851	727,943	1,257,350	2,175,429
2008	76,391	113,155	750,571	1,251,902	2,192,019
2009	75,436	113,328	780,841	1,246,608	2,216,213
2010	74,408	113,369	805,424	1,241,473	2,234,674

SARATOV – SCENARIO 2 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	219,825	288,728	1,061,436	1,884,930	3,454,919
1990	220,115	286,907	1,106,399	1,847,399	3,460,820
1991	222,504	263,594	1,072,717	1,605,323	3,164,138
1992	222,285	284,805	1,026,469	1,671,600	3,205,159
1993	216,676	276,709	957,042	1,670,095	3,120,522
1994	210,817	274,480	886,645	1,665,864	3,037,806
1995	204,805	264,517	845,487	1,638,045	2,952,853
1996	198,692	271,701	877,981	1,629,970	2,978,345
1997	192,495	278,712	903,372	1,621,977	2,996,555
1998	186,236	285,545	941,747	1,614,063	3,027,590
1999	179,941	292,194	973,984	1,606,228	3,052,347
2000	173,625	297,154	992,283	1,599,150	3,062,211
2001	171,309	301,895	1,026,741	1,591,471	3,091,416
2002	168,988	306,413	1,056,374	1,583,869	3,115,644
2003	166,665	310,705	1,091,026	1,576,343	3,144,739
2004	164,344	314,765	1,122,060	1,568,893	3,170,061
2005	162,012	318,591	1,162,389	1,561,516	3,204,508
2006	159,649	322,177	1,195,447	1,554,214	3,231,487
2007	157,234	325,520	1,240,796	1,546,985	3,270,534
2008	154,742	328,615	1,278,076	1,539,827	3,301,261
2009	152,142	331,458	1,327,949	1,532,742	3,344,291
2010	149,412	334,045	1,368,451	1,525,799	3,377,706

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VOLGOGRAD – SCENARIO 2 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	235,787	441,900	2,333,000	886,900	3,897,587
1990	238,125	440,400	2,269,300	938,100	3,885,925
1991	238,597	455,500	2,185,500	891,600	3,771,197
1992	239,706	490,900	1,986,800	969,100	3,686,506
1993	233,660	476,945	1,852,420	974,255	3,537,280
1994	227,355	473,103	1,716,162	974,532	3,391,152
1995	220,893	380,379	1,670,915	1,008,301	3,280,488
1996	214,325	389,515	1,737,177	1,003,599	3,344,616
1997	207,670	398,302	1,788,953	998,944	3,393,869
1998	200,952	406,729	1,867,206	994,336	3,469,223
1999	194,197	414,788	1,932,941	989,774	3,531,700
2000	187,418	420,346	1,970,256	985,868	3,563,888
2001	184,668	425,495	2,040,522	981,397	3,632,083
2002	181,911	430,229	2,100,948	976,971	3,690,060
2003	179,153	434,541	2,171,610	972,589	3,757,893
2004	176,397	438,422	2,234,892	968,250	3,817,961
2005	173,631	441,866	2,317,129	963,955	3,896,581
2006	170,831	444,865	2,384,540	959,703	3,959,940
2007	167,978	447,411	2,477,014	955,647	4,048,050
2008	165,045	449,497	2,553,035	951,904	4,119,480
2009	162,000	451,115	2,654,734	948,491	4,216,340
2010	158,821	452,256	2,737,323	945,426	4,293,825

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VORONEZH – SCENARIO 2 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	281,807	423,018	N/A	N/A	N/A
1990	285,081	444,663	N/A	N/A	N/A
1991	293,855	442,371	N/A	N/A	N/A
1992	305,375	448,625	2,389,657	1,148,000	4,291,657
1993	301,081	435,872	2,228,029	1,150,784	4,115,766
1994	295,902	432,360	2,064,143	1,149,446	3,941,851
1995	290,184	413,240	2,042,145	1,140,220	3,885,789
1996	284,106	424,409	2,125,014	1,134,673	3,968,202
1997	277,731	435,303	2,189,766	1,129,182	4,031,982
1998	271,138	445,914	2,287,631	1,123,745	4,128,428
1999	264,419	456,233	2,369,841	1,118,363	4,208,857
2000	257,620	463,910	2,416,508	1,113,035	4,251,074
2001	255,981	471,241	2,504,385	1,107,760	4,339,367
2002	254,320	478,220	2,579,955	1,102,538	4,415,034
2003	252,654	484,840	2,668,327	1,097,368	4,503,189
2004	250,995	491,095	2,747,468	1,092,250	4,581,807
2005	249,300	496,978	2,850,316	1,087,183	4,683,777
2006	247,492	502,483	2,934,622	1,082,166	4,766,763
2007	245,499	507,602	3,050,272	1,077,200	4,880,573
2008	243,235	512,331	3,145,346	1,072,283	4,973,194
2009	240,590	516,660	3,272,533	1,065,335	5,095,117
2010	237,484	520,584	3,375,820	1,055,697	5,189,585

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RYAZAN – SCENARIO 3 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	100,394	134,000	660,200	1,306,700	2,201,294
1990	101,984	134,000	658,400	1,399,600	2,293,984
1991	102,933	134,000	629,300	1,383,800	2,250,033
1992	106,062	134,000	572,700	1,342,400	2,155,162
1993	103,440	130,191	533,965	1,338,904	2,106,499
1994	100,677	129,142	494,688	1,334,165	2,058,672
1995	97,079	97,664	488,010	1,328,284	2,011,038
1996	93,486	99,893	507,733	1,322,488	2,023,599
1997	89,907	102,022	523,144	1,316,799	2,031,871
1998	86,355	104,049	546,436	1,311,211	2,048,051
1999	82,845	105,971	566,002	1,305,719	2,060,537
2000	79,980	107,244	577,108	1,300,292	2,064,624
2001	79,184	108,403	598,023	1,294,130	2,079,741
2002	78,386	109,446	616,009	1,288,031	2,091,871
2003	77,587	110,371	637,041	1,281,992	2,106,991
2004	76,788	111,176	655,876	1,276,014	2,119,855
2005	75,984	111,859	680,354	1,270,156	2,138,354
2006	75,162	112,418	700,419	1,264,428	2,152,428
2007	74,311	112,851	727,943	1,258,837	2,173,942
2008	73,417	113,155	750,571	1,253,389	2,190,532
2009	72,462	113,328	780,841	1,248,095	2,214,726
2010	71,434	113,369	805,424	1,242,960	2,233,186

SARATOV – SCENARIO 3 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	219,825	288,728	1,061,436	1,884,930	3,454,919
1990	220,115	286,907	1,106,399	1,847,399	3,460,820
1991	222,504	263,594	1,072,717	1,605,323	3,164,138
1992	222,285	284,805	1,026,469	1,671,600	3,205,159
1993	216,676	276,709	957,042	1,670,095	3,120,522
1994	210,817	274,480	886,645	1,665,864	3,037,806
1995	203,265	264,517	845,487	1,638,815	2,952,083
1996	195,738	271,701	877,981	1,630,912	2,976,332
1997	188,255	278,712	903,372	1,623,154	2,993,493
1998	180,837	285,545	941,747	1,615,533	3,023,662
1999	173,510	292,194	973,984	1,608,037	3,047,725
2000	167,511	297,154	992,283	1,600,800	3,057,748
2001	165,195	301,895	1,026,741	1,593,122	3,086,953
2002	162,874	306,413	1,056,374	1,585,520	3,111,181
2003	160,551	310,705	1,091,026	1,577,994	3,140,276
2004	158,230	314,765	1,122,060	1,570,543	3,165,598
2005	155,899	318,591	1,162,389	1,563,167	3,200,045
2006	153,536	322,177	1,195,447	1,555,864	3,227,024
2007	151,120	325,520	1,240,796	1,548,635	3,266,071
2008	148,628	328,615	1,278,076	1,541,478	3,296,797
2009	146,029	331,458	1,327,949	1,534,392	3,339,828
2010	143,299	334,045	1,368,451	1,527,449	3,373,243

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VOLGOGRAD – SCENARIO 3 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	235,787	441,900	2,333,000	886,900	3,897,587
1990	238,125	440,400	2,269,300	938,100	3,885,925
1991	238,597	455,500	2,185,500	891,600	3,771,197
1992	239,706	490,900	1,986,800	969,100	3,686,506
1993	233,660	476,945	1,852,420	974,255	3,537,280
1994	227,355	473,103	1,716,162	974,532	3,391,152
1995	219,730	380,379	1,670,915	1,008,882	3,279,906
1996	212,095	389,515	1,737,177	1,004,180	3,342,968
1997	204,470	398,302	1,788,953	999,526	3,391,250
1998	196,876	406,729	1,867,206	994,918	3,465,729
1999	189,342	414,788	1,932,941	990,356	3,527,427
2000	182,803	420,346	1,970,256	986,330	3,559,734
2001	180,053	425,495	2,040,522	981,859	3,627,929
2002	177,296	430,229	2,100,948	977,432	3,685,906
2003	174,538	434,541	2,171,610	973,050	3,753,739
2004	171,782	438,422	2,234,892	968,712	3,813,808
2005	169,016	441,866	2,317,129	964,417	3,892,428
2006	166,216	444,865	2,384,540	960,165	3,955,786
2007	163,363	447,411	2,477,014	956,109	4,043,896
2008	160,429	449,497	2,553,035	952,365	4,115,327
2009	157,385	451,115	2,654,734	948,953	4,212,186
2010	154,206	452,256	2,737,323	945,887	4,239,672

VORONEZH – SCENARIO 3 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	281,807	423,018	N/A	N/A	N/A
1990	285,081	444,663	N/A	N/A	N/A
1991	293,855	442,371	N/A	N/A	N/A
1992	305,375	448,625	2,389,657	1,148,000	4,291,657
1993	301,081	435,872	2,228,029	1,150,784	4,115,766
1994	295,902	432,360	2,064,143	1,149,446	3,941,851
1995	288,714	413,240	2,042,145	1,140,955	3,885,054
1996	281,288	424,409	2,125,014	1,135,408	3,966,119
1997	273,686	435,303	2,189,766	1,129,917	4,028,672
1998	265,987	445,914	2,287,631	1,124,480	4,124,012
1999	258,283	456,233	2,369,841	1,119,098	4,203,456
2000	251,788	463,910	2,416,508	1,113,770	4,245,976
2001	250,148	471,241	2,504,385	1,108,495	4,334,269
2002	248,488	478,220	2,579,955	1,103,273	4,409,936
2003	246,822	484,840	2,668,327	1,098,103	4,498,091
2004	245,162	491,095	2,747,468	1,092,984	4,576,710
2005	243,468	496,978	2,850,316	1,087,917	4,678,679
2006	241,660	502,483	2,934,622	1,082,901	4,761,665
2007	239,607	507,602	3,050,272	1,077,935	4,875,475
2008	237,402	512,331	3,145,346	1,073,018	4,968,096
2009	234,757	516,660	3,272,533	1,065,434	5,089,384
2010	231,851	520,584	3,375,820	1,055,796	5,183,852

RYAZAN – SCENARIO 4 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	100,394	134,000	660,200	1,306,700	2,201,294
1990	101,984	134,000	658,400	1,399,600	2,293,984
1991	102,933	134,000	629,300	1,383,800	2,250,033
1992	106,062	134,000	572,700	1,342,400	2,155,162
1993	103,440	130,191	533,965	1,338,904	2,106,499
1994	100,677	129,142	494,688	1,334,165	2,058,672
1995	103,752	97,664	488,010	1,326,591	2,016,017
1996	106,411	99,893	507,733	1,322,052	2,036,089
1997	108,663	102,022	523,144	1,317,873	2,051,703
1998	110,522	104,049	546,436	1,314,052	2,075,059
1999	112,002	105,971	566,002	1,310,585	2,094,560
2000	108,084	107,244	577,108	1,306,651	2,099,088
2001	106,392	108,403	598,023	1,301,714	2,114,532
2002	104,696	109,446	616,009	1,296,889	2,127,039
2003	102,999	110,371	637,041	1,292,175	2,142,586
2004	101,303	111,176	655,876	1,287,571	2,155,927
2005	99,602	111,859	680,354	1,283,082	2,174,897
2006	97,882	112,418	700,419	1,278,713	2,189,432
2007	96,133	112,851	727,943	1,274,472	2,211,399
2008	94,341	113,155	750,571	1,270,366	2,228,433
2009	92,489	113,328	780,841	1,266,404	2,253,062
2010	90,563	113,369	805,424	1,262,593	2,271,948

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SARATOV – SCENARIO 4 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	219,825	288,728	1,061,436	1,884,930	3,454,919
1990	220,115	286,907	1,106,399	1,847,399	3,460,820
1991	222,504	263,594	1,072,717	1,605,323	3,164,138
1992	222,285	284,805	1,026,469	1,671,600	3,205,159
1993	216,676	276,709	957,042	1,670,095	3,120,522
1994	210,817	274,480	886,645	1,665,864	3,037,806
1995	214,700	264,517	845,487	1,633,744	2,958,447
1996	217,882	271,701	877,981	1,626,728	2,994,293
1997	220,381	278,712	903,372	1,620,203	3,022,668
1998	222,218	285,545	941,747	1,614,166	3,063,675
1999	223,419	292,194	973,984	1,608,612	3,098,209
2000	215,603	297,154	992,283	1,603,488	3,108,528
2001	211,788	301,895	1,026,741	1,597,002	3,137,426
2002	207,968	306,413	1,056,374	1,590,580	3,161,335
2003	204,146	310,705	1,091,026	1,584,223	3,190,100
2004	200,325	314,765	1,122,060	1,577,929	3,215,079
2005	196,495	318,591	1,162,389	1,571,701	3,249,175
2006	192,633	322,177	1,195,447	1,565,670	3,275,927
2007	188,718	325,520	1,240,796	1,559,849	3,314,883
2008	184,726	328,615	1,278,076	1,554,252	3,345,670
2009	180,628	331,458	1,327,949	1,548,894	3,388,929
2010	176,398	334,045	1,368,451	1,543,790	3,422,684

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VOLGOGRAD – SCENARIO 4 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	235,787	441,900	2,333,000	886,900	3,897,587
1990	238,125	440,400	2,269,300	938,100	3,885,925
1991	238,597	455,500	2,185,500	891,600	3,771,197
1992	239,706	490,900	1,986,800	969,100	3,686,506
1993	233,660	476,945	1,852,420	974,255	3,537,280
1994	227,355	473,103	1,716,162	974,532	3,391,152
1995	230,878	380,379	1,670,915	1,001,322	3,283,495
1996	233,691	389,515	1,737,177	994,945	3,355,328
1997	235,811	398,302	1,788,953	988,925	3,411,990
1998	237,263	406,729	1,867,206	983,259	3,494,456
1999	238,072	414,788	1,932,941	977,945	3,563,746
2000	229,781	420,346	1,970,256	975,494	3,595,876
2001	225,517	425,495	2,040,522	971,714	3,663,249
2002	221,248	430,229	2,100,948	967,972	3,720,397
2003	216,977	434,541	2,171,610	964,267	3,787,395
2004	212,708	438,422	2,234,892	960,793	3,846,815
2005	208,429	441,866	2,317,129	957,580	3,925,004
2006	204,116	444,865	2,384,540	954,642	3,988,164
2007	199,750	447,411	2,477,014	951,994	4,076,168
2008	195,304	449,497	2,553,035	949,651	4,147,486
2009	190,746	451,115	2,654,734	947,632	4,244,227
2010	186,054	452,256	2,737,323	945,955	4,321,588

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VORONEZH – SCENARIO 4 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	281,807	423,018	N/A	N/A	N/A
1990	285,081	444,663	N/A	N/A	N/A
1991	293,855	442,371	N/A	N/A	N/A
1992	305,375	448,625	2,389,657	1,148,000	4,291,657
1993	301,081	435,872	2,228,029	1,150,784	4,115,766
1994	295,902	432,360	2,064,143	1,149,446	3,941,851
1995	310,019	413,240	2,042,145	1,124,908	3,890,312
1996	322,575	424,409	2,125,014	1,114,527	3,986,524
1997	333,631	435,303	2,189,766	1,104,757	4,063,457
1998	343,267	445,914	2,287,631	1,095,597	4,172,408
1999	351,575	456,233	2,369,841	1,087,043	4,264,692
2000	341,771	463,910	2,416,508	1,083,881	4,306,070
2001	337,126	471,241	2,504,385	1,079,698	4,392,450
2002	332,460	478,220	2,579,955	1,075,557	4,466,192
2003	327,789	484,840	2,668,327	1,071,457	4,552,412
2004	323,124	491,095	2,747,468	1,067,398	4,629,085
2005	318,424	496,978	2,850,316	1,063,380	4,729,097
2006	313,610	502,483	2,934,622	1,059,402	4,810,117
2007	308,612	507,602	3,050,272	1,055,463	4,921,949
2008	303,342	512,331	3,145,346	1,049,684	5,010,702
2009	297,692	516,660	3,272,533	1,041,964	5,128,848
2010	291,581	520,584	3,375,820	1,034,321	5,222,306

RYAZAN – SCENARIO 5 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	100,394	134,000	660,200	1,306,700	2,201,294
1990	101,984	134,000	658,400	1,399,600	2,293,984
1991	102,933	134,000	629,300	1,383,800	2,250,033
1992	106,062	134,000	572,700	1,342,400	2,155,162
1993	103,440	130,191	533,965	1,338,904	2,106,499
1994	100,677	129,142	494,688	1,334,165	2,058,672
1995	103,002	97,664	488,010	1,326,965	2,015,643
1996	104,974	99,893	507,733	1,322,427	2,035,026
1997	106,600	102,022	523,144	1,318,248	2,050,014
1998	107,895	104,049	546,436	1,314,426	2,072,807
1999	108,873	105,971	566,002	1,310,960	2,091,806
2000	105,110	107,244	577,108	1,306,948	2,096,411
2001	103,417	108,403	598,023	1,302,012	2,111,855
2002	101,721	109,446	616,009	1,297,186	2,124,362
2003	100,024	110,371	637,041	1,292,472	2,139,909
2004	98,328	111,176	655,876	1,287,869	2,153,250
2005	96,627	111,859	680,354	1,283,379	2,172,220
2006	94,908	112,418	700,419	1,279,011	2,186,755
2007	93,159	112,851	727,943	1,274,770	2,208,722
2008	91,367	113,155	750,571	1,270,664	2,225,756
2009	89,514	113,328	780,841	1,266,701	2,250,385
2010	87,589	113,369	805,424	1,262,890	2,269,271

SARATOV - SCENARIO 5 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	219,825	288,728	1,061,436	1,884,930	3,454,919
1990	220,115	286,907	1,106,399	1,847,399	3,460,820
1991	222,504	263,594	1,072,717	1,605,323	3,164,138
1992	222,285	284,805	1,026,469	1,671,600	3,205,159
1993	216,676	276,709	957,042	1,670,095	3,120,522
1994	210,817	274,480	886,645	1,665,864	3,037,806
1995	213,160	264,517	845,487	1,634,514	2,957,677
1996	214,929	271,701	877,981	1,627,498	2,992,109
1997	216,141	278,712	903,372	1,620,973	3,019,198
1998	216,818	285,545	941,747	1,614,936	3,059,046
1999	216,988	292,194	973,984	1,609,382	3,092,548
2000	209,489	297,154	992,283	1,604,100	3,103,026
2001	205,675	301,895	1,026,741	1,597,613	3,131,924
2002	201,854	306,413	1,056,374	1,591,192	3,155,833
2003	198,032	310,705	1,091,026	1,584,834	3,184,597
2004	194,212	314,765	1,122,060	1,578,541	3,209,577
2005	190,381	318,591	1,162,389	1,572,312	3,243,673
2006	186,519	322,177	1,195,447	1,566,282	3,270,425
2007	182,604	325,520	1,240,796	1,560,461	3,309,381
2008	178,613	328,615	1,278,076	1,554,863	3,340,168
2009	174,514	331,458	1,327,949	1,549,506	3,383,427
2010	170,285	334,045	1,368,451	1,544,402	3,417,182

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VOLGOGRAD—SCENARIO 5 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	235,787	441,900	2,333,000	886,900	3,897,587
1990	238,125	440,400	2,269,300	938,100	3,885,925
1991	238,597	455,500	2,185,500	891,600	3,771,197
1992	239,706	490,900	1,986,800	969,100	3,686,506
1993	233,660	476,945	1,852,420	974,255	3,537,280
1994	227,355	473,103	1,716,162	974,532	3,391,152
1995	229,716	380,379	1,670,915	1,001,903	3,282,914
1996	231,461	389,515	1,737,177	995,527	3,353,680
1997	232,611	398,302	1,788,953	989,506	3,409,371
1998	233,187	406,729	1,867,206	983,840	3,490,962
1999	233,217	414,788	1,932,941	978,526	3,559,473
2000	225,166	420,346	1,970,256	975,955	3,591,722
2001	220,902	425,495	2,040,522	972,175	3,659,095
2002	216,633	430,229	2,100,948	968,433	3,716,244
2003	212,362	434,541	2,171,610	964,728	3,783,242
2004	208,093	438,422	2,234,892	961,255	3,842,662
2005	203,814	441,866	2,317,129	958,041	3,920,851
2006	199,501	444,865	2,384,540	955,104	3,984,010
2007	195,135	447,411	2,477,014	952,455	4,072,015
2008	190,689	449,497	2,553,035	950,112	4,143,333
2009	186,131	451,115	2,654,734	948,094	4,240,074
2010	181,439	452,256	2,737,323	946,416	4,317,434

VORONEZH – SCENARIO 5 (1000 cubic meters)					
Year	Resid	Comm	Ind	DH	Total
1989	281,807	423,018	N/A	N/A	N/A
1990	285,081	444,663	N/A	N/A	N/A
1991	293,855	442,371	N/A	N/A	N/A
1992	305,375	448,625	2,389,657	1,148,000	4,291,657
1993	301,081	435,872	2,228,029	1,150,784	4,115,766
1994	295,902	432,360	2,064,143	1,149,446	3,941,851
1995	308,550	413,240	2,042,145	1,125,643	3,889,578
1996	319,757	424,409	2,125,014	1,115,261	3,984,441
1997	329,586	435,303	2,189,766	1,105,492	4,060,147
1998	338,116	445,914	2,287,631	1,096,332	4,167,992
1999	345,439	456,233	2,369,841	1,087,778	4,259,292
2000	335,938	463,910	2,416,508	1,084,464	4,300,821
2001	331,293	471,241	2,504,385	1,080,281	4,387,201
2002	326,627	478,220	2,579,955	1,076,140	4,460,943
2003	321,956	484,840	2,668,327	1,072,040	4,547,163
2004	317,291	491,095	2,747,468	1,067,981	4,623,835
2005	312,591	496,978	2,850,316	1,063,963	4,723,848
2006	307,778	502,483	2,934,622	1,059,985	4,804,868
2007	302,779	507,602	3,050,272	1,056,047	4,916,700
2008	297,509	512,331	3,145,346	1,049,776	5,004,962
2009	291,860	516,660	3,272,533	1,042,056	5,123,108
2010	285,748	520,584	3,375,820	1,034,413	5,216,566

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APPENDIX 4-A

The following data and information are included in this appendix:

1. Local Labor and Construction Cost Data
2. Technical Data Summary for the Four Gorgases
3. Current and Proposed Gas Norms
4. Cost of Major Equipment and Materials
5. Advanced Control Systems MPR-7075 RTU
6. Alligator Communications, Inc., MAS radio system
7. Distribution System Layout Maps for:
   - Saratov
   - Volgograd
   - Voronezh

1. LOCAL LABOR AND CONSTRUCTION COST DATA

A. JOINT TRENCH CONSTRUCTION

1. Gorgaz does not use joint trench construction. It is prohibited to lay gas and electric lines in the same trench.

2. Giproniigaz does not believe that current standards will be relaxed to allow joint trench construction in the future.

B. GAS PIPELINE REPLACEMENT COSTS (8-2-93, Saratov)

1. The costs shown in the following tables are in rubles per meter (P/m). The first table is for construction not requiring imported backfill. The second table includes the cost of imported backfill (sand). Values given are for depth less than 0.9 meters.

   a. Without imported backfill:

Diameter (mm)	Cost (P/m)
50	661
65	745
80	804
100	1002
150 - 6"	1333
200	2212
250	2660
300	3108
400	4816
500	7280
600	8484
700	9604

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b. With imported backfill (sand)

Diameter (mm)	Cost (P/m)
50	2520
65	2604
80	2660
100	2856
150	3276
200	4200
250	4732
300	5320
400	7112
500	9968
600	11956
700	13636

2. Repaving costs average 7,000 P/m^2.

C. INFLATION

Inflation rates in Russia are very high. During 1992, prices rose an average of 39% per month. The following tables give the month to month inflation rates for 1992 and 1993.

a. Monthly inflation rates for 1992:

Month	Rate (%)
January	249.5
February	42.3
March	20.0
April	22.6
May	20.0
June	17.5
July	16.3
August	11.9
September	16.0
October	18.1
November	21.4
December	15.7

b. Monthly inflation rates for 1993:

Month	Rate (%)
January	22.0
February	29.1
March	20.1
April	21.3
May	13.3
June	19.9
July	21.0

D. BASE COSTS

1. Materials

a. Gas Distribution

i. Steel pipe
200,000 to 237,000 P/ton (8-23-93, V, Sazconov, Ryazan)
287,000 P/ton (8-16-93, S. Ovsyannicov, Veronezh)

ii. Coating
Bituminous coal tar. Two layers of fiberglass and one layer of paper on outside. Applied at 180°C. Approximately 31% of pipe cost (Mr. Tzvetkov, Volgograd). The following were quoted by the Volgograd pipe coating plant on 8-9-93:

Diameter (mm)	Cost (P/m)
57	540
89	603
159	817
219	1085
325	1558
426	1987
530	2375

iii. Regulator
47,000 P (6-1-93, V. Vihai, Veronzeh)

iv. Meter
40,000 to 50,000 P (8-9-93, Mr. Tzvetkov, Volgograd)

v. Fittings (6-1-93, S. Ovsyannicov, Veronezh)
Gate valve: 100mm 21,000 P; 150mm 23,000 P
Reducer: Each of the Gorgases visited fabricate their own reducing fittings at a cost of 500 to 1000 P depending on the diameter of the pipe.

vi. Welding
Rods: 7018, shielded arc welding rods 700,000 P/ton (4-1-93, V. Vihai, Veronezh)
Consumable electrode: 34,000 P/ton (8-16-93, V. Vihai, Veronezh)
Acetylene gas: 834 P/kg (8-16-93, V. Vihai, Veronezh)
Oxygen gas: 31 P/m^3 (8-16-9. . V. Vihai, Veronezh)

vii. Backfill
300 P/m^3 (6-1-93, V. Vihai, Veronezh)

viii. Cooking stove
Gas: 30,000 to 48,000 P (8-9-93, A. Daev, Volgograd)
Electric: 70,000 P (8-9-93, V. Gashilov, Volgograd)

b. Building (8-17-83, V. Vihai, Veronezh)

i. Brick
Red: 48,000 P per 1000 bricks
Silicon: 50,000 P per 1000 bricks

ii. Precast concrete: 30,000 to 35,000 P/m^3

iii. Mortar: 15,000 P/m^3

iv. Lumber:
20mm thick: 38,000 to 40,000 P/m^3
40mm thick: 40,000 to 45,000 P/m^3

v. Sheet steel: 340,000 to 380,000 P/ton

vi. Windows:
Wood frame: 13,800 P/m^2
Glass pane: 560 P/m^2

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vii. Door: 10,800 P/m^2

viii. Plaster: 12,000 P/m^2

ix. Ceramic tile: 14,000 P/m^2

x. Linoleum: 5,000 to 6,000 P/m^2

xi. Light weight concrete: 4,500 P/m^2

c. District Heating (8-18-93, Veronezh)

i. Insulation (mineral wool): 14,000 P/m^3

ii. Jacketing (fiberglass): 600 P/m^2

iii. Boiler pipes: 450,000 P/ton

iv. Gas/water pipe: 300,000 to 350,000 P/ton

v. Circulating pump
1.5 kW, 20 m^3/hr: 300,000 P
320 kW, 800 m^3/hr: 4,000,000 P

vi. Brass pipe: 1,500,000 P/ton

vii. Make-up water: 91.43 P/m^3
.25% make-up water per day

2. Equipment (8-16-93, V. Vihai, Veronezh)

a. Excavator
8,000 P/hr includes operator
Purchase price: 14,000,000 P (June 1, 1993)
Fuel consumption: 4 to 7 l/hr
Oil consumption: 0.5 l/hr

b. Crane: 7,200 P/hr includes operator, fuel, and oil

c. Welding rig: 5,000 P/hr includes fuel and oil

d. Dump truck: 5,600 P/hr

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3. Labor. Rates given in Rubles per month (8-20-93), V. Aristova, Ryazan).

   a. White Collar

      i. Manager (Gorgaz): 220,000
      ii. Chief Engineer: 178,740
      iii. Lawyer: 85,860
      iv. Safety Engineer: 66,960
      v. Engineer: 59,400 to 71,280
      vi. Economist: 69,120
      vii. Technician: 60,000
      viii. Accountant: 66,960
      ix. Clerk/Typist: 45,300

   b. Blue Collar

      i. Laborer: 48,600
      ii. Welder: 72,600
      iii. Foreman: 75,000
      iv. Plumber: 50,000
      v. Electrician: 63,400
      vi. Carpenter: 57,000 (8-16-93, V. Vihai, Veronezh)
      vii. Mason: 57,000 (8-16-93, V. Vihai, Veronezh)
      viii. Operator: 67,000 (8-16-93, V. Vihai, Veronezh)
      ix. Truck Driver: 57,000 (8-16-93, V. Vihai, Veronezh)

4. Gas (8-19-93, V. Vihai, Veronezh)

   a. Residential Customers
      Gorgaz buys gas at 720 P/1000 m^3 and sells gas at 1,998 P/1000 m^3

   b. Industrial Customers
      Gorgaz buys gas at 12,589 P/1000 m^3 and sells gas at 14,961 P/1000 m^3

E. CATHODIC PROTECTION STATION UNIT RATE

1. The following cost break-down is for a typical 8 anode cathodic protection station.

a. Installation

Activity	Unit	Quant.	Rate	Total
Boring	m	50.00	1,376	68,800
Install anode	ea	8.00	5,816	46,528
Trenching	100 m^3	0.34	33,660	11,444
Install packing	m^3	1.00	2,094	2,094
Splicing	ea	1.00	9,223	9,223
Cal controller	ea	1.00	6,304	6,304
Inst transformer	ea	1.00	2,338	2,338
Subtotal				146,731

b. Material

Description	Unit	Quant.	Rate	Total
Anode	ea	8.00	30,005	240,040
Plastic wrap	ea	.0175	533,334	9,333
Cable	m	43.00	141	6,063
Transformer	ea	1.00	65,050	65,050
Subtotal				320,486

c. Total (Installation + Material) = 467,217
+ 20% VAT = 560,660 P per CP station

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2. TECHNICAL DATA COLLECTED FROM THE FOUR GORGASES

	RAYAZAN	SARATOV	VOLGOGRAD	VORONEZH
Population	530,000	1,000,000	1,050,000	930,000
City Area	213			
City Length Km	30	35	75	40
Avg # workers	425		1,000	940
Avg salary roubles			90,000	
CGS	2	3	6	3(4)
Meter runs	4		11	7(3)
Total meter capacity 1000m3/hr	467	635	1,583	650
By station	385	305	225	300
	82	120	320	300
		210	300	50
			368	200(P)
			270	
			100	
Straightening Vanes	no	no	no	no
Machined Meter Tubes	no	no	no	no
Regulator runs	4/3			7(3)
Regulator Capacity				
Scrubbers				
Odorization				
Gas Quality Measurement				
Single Point				
Multiple Points				
# Transmission lines				5
GRPs (hp=>mp)	8		2	7
Meter runs	0			21
GRPs (mp=>lp)		120		
Aboveground Brick	109		286	161
Aboveground Cabinet	90		100	144
Total Main Length (Km)	840	1,634	1,965	1,634
Total Buried	692	738	1,805	1,399
Total Aboveground	148	900	160	236
HP	111	240	56	178
MP	112	19	462	181
LP	617	357	1,147	1,042
HP Buried				
HP overhead	Y			
MP Buried				
MP overhead	Y			
LP Buried				
LP Overhead				
Diameter by Length (km)				
HP 219mm			2	
average dia 200mm	Y			
average dia 400mm				Y
700mm			55	
MP 57mm				
average dia 100mm			Y	
average dia 225mm	Y			
average dia 325mm				Y
500mm				
LP 25mm				
average dia 100mm			Y	
average dia 125mm	Y			
average dia 219mm				Y
300mm				
Plastic Main			0	
Annual Replacement Rate	5	6.2		1.5
Annual Addition Rate	15			20
Number of Leaks/year	8			3
Replacement Criteria System	20pt		18pt	10pt
Kms of main adjacent train tracks	3		54	130
Oldest gas line (yrs)	40			35
Pipe greater than 25yrs				

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2. TECHNICAL DATA COLLECTED FROM THE FOUR GORGASES

	RAYAZAN	SARATOV	VOLGOGRAD	VORONEZH
Total Number Services	23,237			217,000
HP				
MP				
LP				
Total Service Length				
Subset of total mains			471	
HP				
MP				
LP		1,045		
HP Buried				
HP overhead				
MP Buried				
MP overhead				
LP Buried				
LP Overhead				
Customer Base				
District Heating				
Cogeneration	2	4	3	2
Heating Boilers	173			
Muni/small business			203	134
Industrial			189	112
Other	0		3	65
Industrial Sites	77	250	180	188
Commercial Establishments	1,015	1,133	650	243
Residential (Apts+Private Homes)	163,379	292,495	295,500	293,876
Apt Units	148,229	251,692	259,100	242,800
Cooking	153,229	194,850	151,744	242,800
Hot Water	42,000	39,383	115,941	150,446
Space Heat	0	17,763		
Private Homes	15,150	40,500	36,400	44,285
Cooking/Hot Water				
Cooking/HotWater/Heat	3,788	40,500	26,102	
Heat Only			7,332	
Cooking/Space Heating	11,363			
Gas Consumption (mcm)				
Industrial	1,915,100	993,000	2,968,200	3,537,657
Commercial	72,200	299,000	481,500	455,507
Residential	90,200	198,036	192,300	435,559
Sub Total	2,077,500	1,490,036	3,642,000	4,428,723
District Heating	incl in Ind	1,692,000	incl in Ind	incl in Ind
TOTAL	2,077,500	3,182,036	3,642,000	4,428,723
Consumptiom Norms				
mcm per person per month				
Cooking – gas cooker	7.6	10	8.4	12
Water Heating – Water Heater			11.1	
Heating Premise/sq.meter	6		4.5	4.5
Cooking+Water Heating	12.6	15		21
Cost per person per month				
Cooking – gas cooker			16R,77K	24R
Water Heating – Water Heater			22R,2K	
Heating Premise/sq.meter			9R,0K	9R
Cooking+Water Heating				42R
Annual Allowance per person				
Cooking (mjoules)			2,800	
Water heating (mjoules)			8,000	
Central Heating (mcm)	1,342,400	1,671,600	969,100	169,906
10 Largest Industries	231,700	531,000	1,076,400	34,083
Joseph Industries		1,485,000	720,900	195,000
Peak Day Annual		14,100		
Winter	12		17,900	
Summer			7,800	

2. TECHNICAL DATA COLLECTED FROM THE FOUR GORGASES

	RAYAZAN	SARATOV	VOLGOGRAD	VORONEZH
Cathodic Protection				
Isolating flanges (AG/BG)	371		6,800	1,733
CP Stations (rectifiers)	213	265	655	217
CP Stations needing repair	40		178	50
Drainage Stations	3	85	46	54
Anode Beds	9		2	59
Pipe with CP protection (kms)	806	558	803	449
Pipe needing CP protection	20	178	48	0
Percent of pipe protected				
KW/hr consumption				
Avg monthly elect bill roubles	55,000		4,000,000	
Avg annual elet bill roubles	16,500,000		48,000,000	44,000,000
Roulbes/KWhr	25		24	40
Leak Data				
Average Response Time (min)	25	35	45	40
1992				
Main				
Corrosion	0	15	4	4
Mechanical	5	11		
Services				
Corrosion				
Mechanical				
House Piping/Appliances				
1993				
Main				
Corrosion		6	4	4
Mechanical		7		
Services				
Corrosion				
Mechanical				
House Piping/Appliances				
Leak Detection Surveys				
Inspectors	75	90	120	
Leak Detectors (CGI's)	80	45	300	115
Street/house surveys required	40		120	
Emerg Resp;Main – required	40		80	
Detectors at Oblegas				300
Detectors requiring repair/replacement	80		200	115
Leak Detector (FI's equiv)	6		18	
Gas Chromatograph	0		3	2
Chrom. age			1978,87,91	
Survey frequency				
HP – wkly	3		3	1
LP >25 yrs – wkly	1		1	
LP < 25 yrs – moly	2		2	2
Walking Survey every 3 yrs	Y		Y	Y
SCADA				
RTU (Flow computer)				
CGSs	2	3	6	4
Major Industries	20	50	100	90
Agriculture				
Combined pwr/htg	2	4	12	8
Central Htg			6	3
Boiler Houses	50	52	100	100
Regulator Stns	25	50	75	50
Total	99	159	299	255
Digital Transducers				
Metering (temp,static,delta P)	297	477	897	765
Inlet/Outlet Pressure CGS	4	6	12	8
Inlet Pressure User	97	156	293	251
Additional I/O				
Control CGS				
Status CGS				

2. TECHNICAL DATA COLLECTED FROM THE FOUR GORGASES

	RAYAZAN	SARATOV	VOLGOGRAD	VORONEZH
Base Radio Station	1	1	1	1
Remote Stations	99	159	299	255
Communication PC	1	1	1	1
Control Room				
PC Network				
Communication PC	1	1	1	1
Application PC	2	2	2	2
Printers	2	2	2	2
Software				
Meters				
Rotary	250	0	443	438
Orifice	72	1,133	125	225
Turbine	0	250	0	10
Largest Rotary Meter (cm)	1,000		1,000	1,000
Meters/Industial Site		250		
Meters/Commercial Site		1,133		
Meters/Apartment Blocks				
Meters/Other				
Unmetered locations	1,015		34	
Schools			6	
Hospitals			8	
Canteens/cafes			10	
Cooperatives			10	
Manpower				
Emergency Response	37		116	82
Number of districts	1		6/3	
Number of crews	1		6/3	4/1
24 hr coverage	Y		Yes	Yes
Max Travel dist (Km)	20		40	40
Dispatch time (min)			5	
Travel time (min)			40	
Supervision respond	Y		Yes	Yes
Communications	R/PT		R/PT	R
Dispatch Center	Y		Yes	Yes
Staffing (Budget)	425	473	996	1055(B)
Gas Maintenance	248	277	607	755
Emergency Response	37	50	165	82
Administrative	51		63	59
Liqified Gas Service	18	23	36	34
Transportation	48	84	83	106
Laboratory	9	5	14	7
Sales Dept	14	22	28	12
Administration		12	63	
Technical/Engineering			136	217
Laborers,Guards,Cleaners, etc			797	838
Equipment				
Excavators/Operators			6/6	
Pumps/Operators			3/3	
Compressors/Operators			4/4	
Truck Crane/Operator			1/1	
Welding Truck/Driver/Welders			3/3/6	
District Heating Piping (km)				322
50 – 100mm			9	
100 – 200mm			12.8	
200 – 300mm			8.6	
>300mm			1.3	
Requires Replacement			22.2	
300 – 500mm			60.7	
Requires Replacement			11.3	
Cost to Replace ($million)			21.94	

2. TECHNICAL DATA COLLECTED FROM THE FOUR GORGASES

		RAYAZAN	SARATOV	VOLGOGRAD	VORONEZH
Construction Equipment					
Excavators				4	
Welding Machines				12	
House piping					
Riser sizing (mm)					
5 stories or less				32	
6 stories and up				40/57	
Average (mm)					40
Cooking only up to 9 stories		25–15			20–25
Cooking + Hot water up to 5 stories		20/25			40
oven load cm/hr		0.4			
range burnerload cm/hr		0.2			
Average of Monthly Average Temperature 1881–1960	Jan	−11.1	−11.9	−9.2	−9.3
	Feb	−10.4	−11.3	−8.7	−9.2
	Mar	−5.4	−5.2	−2.3	−4.1
	Apr	4.1	5.8	8.3	5.9
	May	12.6	15.1	16.7	14.0
	Jun	16.7	20.0	21.6	18.0
	Jul	18.8	22.1	24.2	19.9
	Aug	17.1	20.6	22.7	18.7
	Sep	11.2	14.1	16.1	12.8
	Oct	4.2	5.7	7.8	5.6
	Nov	−2.6	−2.4	0.0	−1.1
	Dec	−8.2	−8.7	−6.1	−6.7
Maximum Difference between Daily High and Low 1936–60	Jan	22.4	18.9		22.4
	Feb	22.2	21.6		19.7
	Mar	17.6	19.7		18.5
	Apr	17.4	21.5		18.8
	May	22.2	19.7		20.5
	Jun	18.2	21.3		20.4
	Jul	20.3	20.4		19.9
	Aug	21.7	21.2		20.1
	Sep	20.2	20.8		20.8
	Oct	17.8	19.1		21.6
	Nov	16.7	17.4		16.3
	Dec	24.3	22.0		21.6
Average of Monthly Average Difference between Daily High and Low 1936–60	Jan	6.8	6.8	6.8	6.7
	Feb	7.1	6.8	7.1	6.7
	Mar	7.3	7.2	8.9	7.0
	Apr	8.0	9.9	11.8	9.1
	May	10.8	11.6	13.2	11.9
	Jun	11.5	12.0	12.7	12.0
	Jul	11.1	11.9	12.7	11.8
	Aug	10.9	11.9	13.0	11.6
	Sep	9.6	11.0	12.3	10.6
	Oct	6.4	8.1	10.3	7.6
	Nov	5.0	6.1	7.0	5.5
	Dec	5.4	6.1	5.8	5.2

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January 16,1992 Volgograd	Time	Temp	1000m3/hr	Cum 1000m3
	0–1	–9	711	711
	1–2	–9	712	1,423
	2–3	–10	713	2,136
	3–4	–10	719	2,855
	4–5	–15	715	3,570
	5–6	–15	724	4,294
	6–7	–15	743	5,037
	7–8	–15	734	5,771
	8–9	–14	736	6,507
	9–10	–14	720	7,227
	10–11	–13	723	7,950
	11–12	–11	727	8,677
	12–1	–10	729	9,406
	1–2	–10	729	10,135
	2–3	–10	732	10,867
	3–4	–10	728	11,595
	4–5	–10	725	12,320
	5–6	–10	745	13,065
	6–7	–11	750	13,815
	7–8	–11	746	14,561
	8–9	–12	744	15,305
	9–10	–12	744	16,049
	10–11	–12	744	16,793
	11–12	–12	744	17,537
	Avg		–12	731

Volgograd Monthly Sales 1000m3 1992							
	Regional Industrial	Industrial	Residential	Small Businesses	Boilers >20 gigcal	losses	Total Sales
Jan	605	345,624	22,677	34,510	51,495	6,309	461,220
Feb	656	320,117	24,870	31,816	47,088	2,588	427,135
Mar	852	302,777	19,312	27,966	43,371	3,179	397,457
Apr	629	234,473	7,978	14,622	21,681	2,882	282,265
May	448	196,399	3,628	5,612	11,256	2,042	219,385
Jun	477	170,734	3,394	3,901	7,402	1,796	187,704
Jul	443	165,331	3,657	3,416	4,908	1,898	179,653
Aug	379	160,086	3,505	3,220	3,840	1,786	172,816
Sep	424	165,975	3,505	3,159	5,059	1,862	179,984
Oct	830	244,243	12,634	12,260	19,803	4,263	[illegible]
Nov	599	293,854	18,286	22,077	35,327	3,007	373,150
Dec	837	343,855	28,291	29,988	47,186	5,882	456,039
total	7,179	2,943,468	151,737	192,547	298,416	37,494	3,630,841

December 24, 1992 Voronezh	Time	Temp	1000m3/hr	Cum 1000m3
	0–1		430	430
	1–2		429	859
	2–3		438	1,297
	3–4		435	1,732
	4–5		450	2,182
	5–6		450	2,632
	6–7		480	3,112
	7–8		485	3,597
	8–9		490	4,087
	9–10		500	4,587
	10–11		490	5,077
	11–12		484	5,561
	12–1		479	6,040
	1–2		475	6,515
	2–3		480	6,995
	3–4		490	7,485
	4–5		490	7,975
	5–6		488	8,463
	6–7		493	8,956
	7–8		486	9,442
	8–9		473	9,915
	9–10		463	10,378
	10–11		450	10,828
	11–12		426	11,254
	Avg	−14.4	469	
	Corrected Actual			

Voronezh Monthly Sales 1000m3 1992					
		Industrial	Residential	Small Businesses	Total Sales
Jan		249,600	38,000	54,600	342,200
Feb		224,000	38,500	52,100	314,600
Mar		220,300	32,000	44,800	297,100
Apr		165,500	23,500	32,900	221,900
May		113,000	11,000	13,100	137,100
Jun		110,800	10,800	8,900	130,500
Jul		111,700	11,300	8,200	131,200
Aug		108,900	12,000	9,200	130,100
Sep		112,400	13,900	11,900	138,200
Oct		176,700	26,300	33,200	236,200
Nov		198,900	33,900	40,100	272,900
Dec		232,800	38,300	62,700	333,800
total		2,024,600	289,500	371,700	2,685,800

Ryazan Monthly Sales 1000m3 1992

		Industrial	Residential	Small Businesses	Total Sales
Jan		201,000	14,000	21,470	236,470
Feb		188,800	10,900	18,500	218,200
Mar		198,900	7,100	16,900	222,900
Apr		157,300	7,000	13,900	178,200
May		117,800	7,700	6,900	132,400
Jun		88,000	2,200	3,500	93,700
Jul		100,400	3,500	3,400	107,300
Aug		94,100	3,000	3,700	100,800
Sep		113,500	4,000	4,500	122,000
Oct		182,600	6,400	16,600	205,600
Nov		186,500	10,700	18,000	215,200
Dec		210,400	13,700	20,600	244,700
total		1,839,300	90,200	147,970	2,077,470

January 28,1991 Ryazan

Time	Temp	1000m3/hr	Cum 1000m3
0–1		386	386
1–2		379	765
2–3		381	1,146
3–4		377	1,523
4–5		379	1,902
5–6		406	2,308
6–7		413	2,721
7–8		418	3,139
8–9		417	3,556
9–10		410	3,966
10–11		421	4,387
11–12		425	4,812
12–1		425	5,237
1–2		425	5,662
2–3		438	6,100
3–4		432	6,532
4–5		434	6,966
5–6		429	7,395
6–7		418	7,813
7–8		415	8,228
8–9		416	8,644
9–10		400	9,044
10–11		398	9,442
11–12		391	9,833
Avg	-6.5	410	

Saratov	Time	Temp	1000m3/hr	Cum 1000m3
	0–1		370	370
	1–2		360	730
	2–3		360	1,090
	3–4		360	1,450
	4–5		360	1,810
	5–6		360	2,170
	6–7		370	2,540
	7–8		400	2,940
	8–9		440	3,380
	9–10		450	3,830
	10–11		440	4,270
	11–12		450	4,720
	12–1		450	5,170
	1–2		450	5,620
	2–3		450	6,070
	3–4		440	6,510
	4–5		450	6,960
	5–6		460	7,420
	6–7		450	7,870
	7–8		440	8,310
	8–9		440	8,750
	9–10		430	9,180
	10–11		420	9,600
	11–12		400	10,000
	Avg	–14.4	417	
	Corrected Actual			

Saratov Monthly Sales 1000m3 1992					
		Industrial	Residential	Small Business	Total
Jan					385,500
Feb					345,400
Mar					333,600
Apr					263,850
May					195,700
Jun					151,870
Jul					153,580
Aug					141,600
Sep					166,030
Oct					267,500
Nov					348,800
Dec					411,500
total					3,164,930

2 Volgograd. Gutter News

Копия

С П Р А В К А

месячные нормы расхода природного газа, отпускаемого населению на бытовые нужды без газовых счетчиков по гор. Волгограду

Месяцы	Нормы расхода газа /куб.м./			
	За пользование газовой плитой на человека	За пользование газовой плитой с горячим водоснабжением	За пользование газовой плитой и газовой колонкой	За отопление 1 м отапливаемой площади
I	2	3	4	5
Январь	II	7	I6	I2
Февраль	II	7	I6	I2
Март	II	7	I6	7
Апрель	3	3	6	3
Май	3	3	6	-
Июнь	3	3	6	-
Июль	3	3	6	-
Август	3	3	6	-
Сентябрь	3	3	6	-
Октябрь	II	7	I6	2
Ноябрь	II	7	I6	6
Декабрь	II	7	I6	I2
Итого за год:	84	60	I32	54

Управляющий трестом
"Волгоградгоргаз" В.П.Кочубей

Начальник ПЭО Л.Н.Зайцева

4А-16

→ Ramesh

New norms for Valparad

① Selling price to the public

- cooking only — 12 m^3/person/month
- cooking and water-heating — 20 m^3/person/month

② Wholesale price paid to Mostrangaz

	cooking only	cooking + WH
Jan	18	28
Feb	18	28
March	18	28
Apr	6	12
May	6	12
June	6	12
July	6	12
Aug	6	12
Sept	6	12
Oct	18	28
Nov	18	28
Dec	18	28
Total	144	240

4. COST OF MAJOR EQUIPMENT AND MATERIALS

Table 4A-1

List of major Equipment and Materials – City of Ryazan

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units Installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1994	1995	1996	1997
1. SCADA													
PC based system with hard drive, Color Monitors, modem and printers	#	2	F	30,000	60		2				60		
Gas Chromatograph & Sulfur Analyzers	#	1	F	50,000	50		1				50		
RTU Consisting of 8 analog input, 8 digital input and 8 digital output devices and a 1200 baud modem	#	212	F	4,300	912		2	77	133		9	331	572
Enclosure with heater/blower and UPS	#	212	F	3,000	636		2	77	133		6	231	399
Cables & Wiring	#	212	F	1,000	212		2	77	133		2	77	133
Remote Radio, antenna, pole, cables	#	212	F	4,000	848		2	77	133		8	308	532
Base Radio Station with radio, antenna, modem and support structure	#	4	F	9,000	36		4				36		
									TOTAL		171	947	1,636
2. NETWORK MODELLING													
IBM Compatible 486/66 MHz DX2 Computer with 16 MB RAM, 1GB Hard drive 500 MB tape backup drive, 20 inch SVGA monitor, disk drives, mouse 101 keyboard, miltipen color plotter, laser printer and digitizer	#	1	F	50,000	50	1				50			
Software package for network analysis	#	1	F	200,000	200		1				200		
									TOTAL	50	200		
3. CATHODIC PROTECTION													
Isolation flanges, 150 mm diameter	#	120	F	690	83		120				83		
Anode/Rectifiers	#	18	F	1,280	23			12	6			15	8
Isolation unions, 150 mm	#	452	F	125	57		452				57		
Isolation unions, 50 mm	#	25,363	F	70	1,775		7,148	14,400	3,814		500	1,008	267
Isolation unions, 13 mm	#	1,206	F	10	12		400	600	206		4	6	2
Test Euipment	#	1	F	48,000	48	1				48			
									TOTAL	48	644	1,029	277

Table 4A-1

List of major Equipment and Materials – City of Ryazan

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
4. LEAK DETECTION TEST EQUIPMENT													
Flame Ionization units	#	2	F	8,000	16	2				16			
Portable detectors	#	80	F	3,800	304	80				304			
CP Test Equipment	#	1	F	25,000	25	1				25			
Deadf Weight Tester	#	1	F	9,000	9	1				9			
Coating Tester	#	1	F	10,000	10	1				10			
									TOTAL	364			
5. COMMERCIAL METERS													
Meter including valves and fittings (34 cm/h @ pressure drop=5 mm water)	#	1,105	F	350	387		500	605			175	212	
6. PRIVATE HOME METERS													
Meter including valves and fittings (7 cm/h @ pressure drop=5 mm water)	#	11,363	F	55	625		3,800	3,800	3,763		209	209	207
7. INDUSTRIAL METERS													
Turbine Meters (4000 cm/h) including regulators, isolation valves,relief valves, flow transmitters and fittings	#	77	F	15,000	1,155			77				1,155	
8. APARTMENT BLOCK METERS													
Meter including valves & fittings (34 cm/h @ pressure drop=5 mm water)	#	14,000	F	350	4,900	1,750	4,080	4,080	4,090	613	1,428	1,428	1,432
9. GAS METER TEST EQUIPMENT													
Sonic Nozzle meter for proving meters upto 34 cm/h capacity	#	1	F	67,000	67		1				67		
10. PIPE REPLACEMENT													
Average 150 mm diameter grade B pipe with 3.4 mm wall thickness	Ton	70	D	400	28			70	70			28	28

Table 4A-2

List of major Equipment and Materials – City of Saratov

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units Installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
1. SCADA													
PC based system with hard drive, Color Monitors, modem and printers	#	2	F	30,000	60		2				60		
Gas Chromatograph & Sulfur Analyzers	#	1	F	50,000	50		1				50		
RTU Consisting of 8 analog input, 8 digital input and 8 digital output devices and a 1200 baud modem	#	482	F	4,300	2,073		3	250	229		13	1,075	985
Enclosure with heater/blower and UPS	#	482	F	3,000	1.446		3	250	229		9	750	687
Cables & Wiring	#	482	F	1,000	482		3	250	229		3	250	229
Remote Radio, antenna, pole, cables	#	482	F	4,000	1,928		3	250	229		12	1,000	916
Base Radio Station with radio, antenna, modem and support structure	#	4	F	9,000	36		4				36		
									TOTAL		183	3,075	2,817
2. NETWORK MODELLING													
IBM Compatible 486/66 MHz DX2 Computer with 16 MB RAM, 1GB Hard drive 500 MB tape backup drive, 20 inch SVGA monitor, disk drives, mouse 101 keyboard, miltipen color plotter, laser printer and digitizer	#	1	F	50,000	50	1				50			
Software package for network analysis	#	1	F	200,000	200		1				200		
									TOTAL	50	200		
3. CATHODIC PROTECTION													
Isolation flanges, 150 mm diameter	#	290	F	690	200		145	145			100	100	
Anode/Rectifiers	#	44	F	1,280	56			30	14			38	18
Isolation unions, 150 mm	#	1,102	F	125	138		1,102				138		
Isolation unions, 50 mm	#	42,585	F	70	2,981		9,698	18,800	14,087		679	1,316	986
Isolation unions, 13 mm	#	2,700	F	10	27		1,200	1,200	300		12	12	3
Test Equipment	#	1	F	48000	48	1				48			
									TOTAL	48	929	1,466	1,007

Table 4A-2

List of major Equipment and Materials – City of Saratov

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units Installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
1. SCADA													
PC based system with hard drive, Color Monitors, modem and printers	#	2	F	30,000	60		2				60		
Gas Chromatograph & Sulfur Analyzers	#	1	F	50,000	50		1				50		
RTU Consisting of 8 analog input, 8 digital input and 8 digital output devices and a 1200 baud modem	#	482	F	4,300	2,073		3	250	229		13	1,075	985
Enclosure with heater/blower and UPS	#	482	F	3,000	1,446		3	250	229		9	750	687
Cables & Wiring	#	482	F	1,000	482		3	250	229		3	250	229
Remote Radio, antenna, pole, cables	#	482	F	4,000	1,928		3	250	229		12	1,000	916
Base Radio Station with radio, antenna, modem and support structure	#	4	F	9,000	36		4				36		
									TOTAL		183	3,075	2,817
2. NETWORK MODELLING													
IBM Compatible 486/66 MHz DX2 Computer with 16 MB RAM, 1GB Hard drive 500 MB tape backup drive, 20 inch SVGA monitor, disk drives, mouse 101 keyboard, multipen color plotter, laser printer and digitizer	#	1	F	50,000	50	1				50			
Software package for network analysis	#	1	F	200,000	200		1				200		
									TOTAL	50	200		
3. CATHODIC PROTECTION													
Isolation flanges, 150 mm diameter	#	290	F	690	200		145	145			100	100	
Anode/Rectifiers	#	44	F	1,280	56			30	14			38	18
Isolation unions, 150 mm	#	1,102	F	125	138		1,102				138		
Isolation unions, 50 mm	#	42,585	F	70	2,981		9,698	18,800	14,087		679	1,316	986
Isolation unions, 13 mm	#	2,700	F	10	27		1,200	1,200	300		12	12	3
Test Equipment	#	1	F	48000	48	1				48			
									TOTAL	48	929	1,466	1,007

Table 4A-2

List of major Equipment and Materials – City of Saratov

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
4. LEAK DETECTION TEST EQUIPMENT													
Flame Ionization units	#	3	F	8,000	24	3				24			
Portable detectors	#	55	F	3,800	209	55				209			
CP Test Equipment	#	1	F	25,000	25	1				25			
Deadf Weight Tester	#	1	F	9,000	9	1				9			
Coating Tester	#	1	F	10,000	10	1				10			
									TOTAL	277			
5. COMMERCIAL METERS													
Meter including valves and fittings (34 cm/h @ pressure drop=5 mm water)	#	1,133	F	350	397		1,133				397		
6. PRIVATE HOME METERS													
Meter including valves and fittings (7 cm/h @ pressure drop=5 mm water)	#	30,000	F	55	1,650		10,000	10,000	10,000		550	550	550
7. INDUSTRIAL METERS													
Turbine meters(4000 cm/h) including regulators, isolation valves, relief valves, flow transmitters and fittings	#	250	F	15,000	3,750			250				3,750	
8. APARTMENT BLOCK METERS													
Meter including valves and fittings (34 cm/h @ pressure drop=5 mm water)	#	12,585	F	350	4,405	1,500	3,695	3,805	3,695	525	1,293	1,293	1,293
9. GAS METER TEST EQUIPMENT													
Sonic Nozzle meter for proving meters upto 34 cm/h capacity	#	1	F	67,000	67		1				67		
10. PIPE REPLACEMENT													
Average 150 mm diameter grade B pipe with 3.4 mm wall thickness	Ton	140	C	400	56			140	140			56	56

Table 4A-3

List of major Equipment and Materials – City of Volgograd

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units Installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
1. SCADA													
PC based system with hard drive, Color Monitors, modem and printers	#	2	F	30,000	60		2				60		
Gas Chromatograph & Sulfur Analyzers	#	1	F	50,000	50		1				50		
RTU Consisting of 8 analog input, 8 digital input and 8 digital output devices and a 1200 baud modem	#	518	F	4,300	2,227		6	180	332		26	774	1,428
Enclosure with heater/blower and UPS	#	518	F	3,000	1,554		6	180	332		18	540	996
Cables & Wiring	#	518	F	1,000	518		6	180	332		6	180	332
Remote Radio, antenna, pole, cables	#	518	F	4,000	2,072		6	180	332		24	720	1,328
Base Radio Station with radio, antenna, modem and support structure	#	4	F	9,000	36		4				33		
									TOTAL		220	2,214	4,084
2. NETWORK MODELLING													
IBM Compatible 486/66 MHz DX2 Computer with 16 MB RAM, 1GB Hard drive 500 MB tape backup drive, 20 inch SVGA monitor, disk drives, mouse 101 keyboard, miltipen color plotter, laser printer and digitizer	#	1	F	50,000	50	1				50			
Software package for network analysis	#	1	F	200,000	200		1				200		
									TOTAL	50	200		
3. CATHODIC PROTECTION													
Isolation flanges, 150 mm diameter	#	460	F	690	317		230	230			159	159	
Anode/Rectifiers	#	69	F	1,280	88			45	24			58	31
Isolation unions, 150 mm	#	887	F	125	111		887				111		
Isolation unions, 50 mm	#	46,955	F	70	3,287		10,113	21,200	15,642		708	1,484	1,095
Isolation unions, 13 mm	#	2,364	F	10	24		1,000	800	564		10	8	6
Test Equipment	#	1	F	48,000	48	1				48			
									TOTAL	48	987	1,708	1,131

Table 4A-3

List of major Equipment and Materials – City of Volgograd

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
4. LEAK DETECTION TEST EQUIPMENT													
Flame Ionization units	#	6	F	8,000	48	6				48			
Portable detectors	#	200	F	3,800	760	200				760			
CP Test Equipment	#	1	F	25,000	25	1				25			
Deadf Weight Tester	#	1	F	9,000	9	1				9			
Coating Tester	#	1	F	10,000	10	1				10			
									TOTAL	852			
5. COMMERCIAL METERS													
Meter including valves and fittings (34 cm/h @ pressure drop=5 mm water)	#	650	F	350	228		650				228		
6. PRIVATE HOME METERS													
Meter including valves and fittings (7 cm/h @ pressure drop=5 mm water)	#	34,000	F	55	1,870		11,000	12,000	11,000		605	660	605
7. INDUSTRIAL METERS													
Turbine Meters (4000 cm/h) including regulators, isolation valves, relief valves, flow transmitters and fittings	#	180	F	15,000	2,700			180				2,700	
8. APARTMENT BLOCK METERS													
Meter including valves & fittings (34 cm/h @ pressure drop=5 mm water)	#	12,955	F	350	4,534	1,500	3,818	3,818	3,818	525	1,336	1,336	1,336
9. GAS METER TEST EQUIPMENT													
Sonic Nozzle meter for proving meters upto 34 cm/h capacity	#	1	F	67,000	67		1				67		
10. PIPE REPLACEMENT													
Average 150 mm diameter grade B pipe with 3.4 mm wall thickness	Ton	140	D	400	56			140	140			56	56

Table 4A-4

List of major Equipment and Materials – City of Voronezh

Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units Installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
1. SCADA													
PC based system with hard drive, Color Monitors, modem and printers	#	2	F	30,000	60		2				60		
Gas Chromatograph & Sulfur Analyzers	#	1	F	50,000	50		1				50		
RTU Consisting of 8 analog input, 8 digital input and 8 digital output devices and a 1200 baud modem	#	340	F	4,300	1,462		3	188	149		13	808	641
Enclosure with heater/blower and UPS	#	340	F	3,000	1,020		3	188	149		9	564	447
Cables & Wiring	#	340	F	1,000	340		3	188	149		3	188	149
Remote Radio, antenna, pole, cables	#	340	F	4,000	1,360		3	188	149		12	752	596
Base Radio Station with radio, antenna, modem and support structure	#	4	F	9,000	36		4				36		
									TOTAL		183	2,312	1,833
2. NETWORK MODELLING													
IBM Compatible 486/66 MHz DX2 Computer with 16 MB RAM, 1GB Hard drive 500 MB tape backup drive, 20 inch SVGA monitor, disk drives, mouse 101 keyboard, miltipen color plotter, laser printer and digitizer	#	1	F	50,000	50	1				50			
Software package for network analysis	#	1	F	200,000	200		1				200		
									TOTAL	50	200		
3. CATHODIC PROTECTION													
Isolation flanges, 150 mm diameter	#	210	F	690	145		210				145		
Anode/Rectifiers	#	32	F	1,280	41			20	12			26	15
Isolation unions, 150 mm	#	709	F	125	89		709				89		
Isolation unions, 50 mm	#	68,565	F	70	4,800		10,391	35,400	22,774		727	2,478	1,594
Isolation unions, 13 mm	#	1,890	F	10	19		900	600	390		9	6	4
Test Equipment	#	1	F	48,000	48	1				48			
									TOTAL	48	970	2,510	1,613

Table 4A-4

List of major Equipment and Materials - City of Voronezh

	Description of Equipment/Material	Unit	# Units	Source	Unit Price US$	Total 1000US$	Units Installed by year 1994	1995	1996	1997	Material cost 1000$ by year 1,994	1,995	1,996	1,997
4	LEAK DETECTION TEST EQUIPMENT													
	Flame Ionization units	#	5	F	8,000	40	5				40			
	Portable detectors	#	115	F	3,800	437	115				437			
	CP Test Equipment	#	1	F	25,000	25	1				25			
	Deadf Weight Tester	#	1	F	9,000	9	1				9			
	Coating Tester	#	1	F	10,000	10	1				10			
										TOTAL	521			
5.	COMMERCIAL METERS													
	Meter including valves and fittings (34 cm/h @ pressure drop=5 mm water)	#	243	F	350	85		243				85		
6.	PRIVATE HOME METERS													
	Meter including valves and fittings (7 cm/h @ pressure drop=5 mm water)	#	44,285	F	55	2,436		14,760	14,760	14,760		812	812	812
7.	INDUSTRIAL METERS													
	Turbine Meters (4000 cm/h) including regulators, isolation valves,relief valves, flow transmitters and fittings	#	188	F	15,000	2,820			188				2,820	
8.	APARTMENT BLOCK METERS													
	Meter including valves & fittings (34 cm/h @ pressure drop=5 mm water)	#	24,280	F	350	8,498	3,100	7,060	7,060	7,060	1,085	2,471	2,471	2,471
9.	GAS METER TEST EQUIPMENT													
	Sonic Nozzle meter for proving meters upto 34 cm/h capacity	#	1	F	67,000	67		1				67		
10.	PIPE REPLACEMENT													
	Average 150 mm diameter grade B pipe with 3.4 mm wall thickness	Ton	85	D	400	34			85	85			34	34

5. ADVANCED CONTROL SYSTEMS MPR-7075 RTU

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MPR-7075C REMOTE TERMINAL UNIT

Don't let the micro-size or low price of the MPR-7075C Remote Terminal Unit (RTU) fool you. Utilizing the latest CMOS and LSI logic, the 16 bit processor is designed to do a small job with the same efficiency and reliability as the top-of-the-line MPR-7010A.

The ACS philosophy of building the best possible products is exceeded in just a smaller package. The key feature of the MPR-7075C is its compact, primarily single board design, that provides a low cost solution to those applications that have limited future growth. Add to this its advanced electronics, tremendously high reliability, both an on-board FSK modem and high speed RS-232C digital communications interfaces, and excellent performance and you have a lot of technology in a small package. By incorporating the ACS7000 Protocol, you have an RTU that is specifically developed for both efficient and secure communications via a broad spectrum of modern, high speed digital communications means.

These features make the MPR-7075C RTU both powerful and flexible so that it can meet all of those small but important requirements of today with just enough expansion capability for a few unplanned needs of the future. The ACS attention to quality makes the MPR-7075C ideal for those limited applications required in both the utility (electric, water, gas) and industrial (i.e., refineries, etc.) markets.

THE MPR-7075C IS DESIGNED FOR:

- Supervisory Control And Data Acquisition (SCADA)
- Distribution Management Systems (DMS)
- Energy Management Systems (EMS)
- Water/Wastewater Systems
- Natural Gas Systems
- Oil Refineries
- Other industrial systems requiring reliable and powerful control and data acquisition from a small product design

The MPR-7075C RTU from Advanced Control Systems combines a compact design with advanced features. This RTU has it all - from a high speed 16 bit processor and extensive diagnostics to field programming of the RTU's configuration and characteristics - all at a low cost.

MPR-7075C DESIGN FEATURES INCLUDE:

- Minimum size for those limited requirement installations
- Modular expansion for those cases where just a few more inputs or outputs are needed
- Custom applications facilitated
- Advanced electronic design
- Excellent performance
- 16 bit low power consumption CMOS processor
- Field programmable
- On-Line monitoring and diagnostic facilities
- On-board FSK modem (digital/programmable) and RS-232C digital communications interfaces standard

"SMART" RTU

The MPR-7075C is small enough to be placed on a pole in your electrical distribution network or in a well controlling and monitoring your water pumping system, but offers performance that rivals large application RTUs. The MPR-7075C is an intelligent microprocessor-based RTU capable of a wide range of monitoring and control functions. By selecting the appropriate features, the MPR- 7075C can be used in those small applications required in sophisticated high speed Energy Management Systems (EMS) or in highly distributed lower speed Distribution Management Systems with equal emphasis to the critical nature of both systems.

ACS Proprietary Document

Custom applications that require special protocols or interfaces to unique external intelligent electronic devices or water and gas applications that require complicated calculations and control algorithms at the RTU are all available.

THE MPR-7075C CAN BE CONFIGURED TO SUPPORT:

- Control and monitoring away from the substation site
- Real-Time System Monitoring
- Breaker Control, Recloser Blocking
- Feeder Switching and Line Switching
- Fault Identification, Isolation, and Service Restoration
- Voltage Control/Reduction
- Capacitor Control
- Load Management
- Closed Loop Control
- Distribution System Management
- Water/Gas Valve or Pump Control
- AGA Gas Flow Calculations
- Communications to External Intelligent Electronic Devices (IEDs)
- Unique Foreign Protocols

The MPR-7075C includes advanced features such as Closed Loop Control (CLC), Isolated Analog Outputs, and more. The MPR-7075C design uses modern technology with highly reliable, low power consumption, high noise rejection logic, with primarily single board hardware construction.

True Distribution Management for electric, water or gas applications requires full monitor and control of outside the substation fence or downstream devices. The MPR-7075C is just the RTU for these cases. Single reclosers, pole-top switches, water pumps, tank pumps, gas or water valves, etc., all are important in the overall management of the available resources. The MPR-7075C handles these applications efficiently at the least possible cost.

Additionally, the MPR-7075C RTU has the capability to digitally interface with intelligent electronic devices such as voltage regulators, intelligent meters or smart reclosers. This communication is accomplished through a Programmable Serial Interface (PSI) card located on the RTU bus. The MPR-7075C acts as a local node for interrogating and gathering values from the foreign devices. The remote will accept digitally encoded information and transfer it to the Master Station as points within the RTU, thus requiring no changes to the existing Master-RTU protocol or data handling in the Master Station itself. The physical interface to the intelligent devices is a serial port with multiple devices being addressable on the same serial link. With advanced features, compact packaging, and ease of operation, Advanced Control Systems has created the Micro-Remote Terminal Unit of tomorrow, available today.

ARCHITECTURE AND FLEXIBILITY

The MPR-7075C is designed around a single printed circuit board packed with the latest technology in digital and analog electronics. The base RTU provides eight momentary control relays (four control points), eight digital inputs for status or pulse accumulation, and eight analog input points. This combination meets most of the electric, water, or gas single device monitor and control applications. Where serial interface, analog output, latching or heavy duty control, or just a few more of the base inputs or outputs are needed, modular expansion is simple to add to the maximum design size of the RTU.

Reprogramming of the MPR-7075C software for field expansion is not required. With the installation of expansion modules, additional I/O points may be added as they are needed. Once a new module is added, the microprocessor firmware automatically detects the installation of the new module via the module's ready signals, thus eliminating any reprogramming.

NEMA 4 class wall or pole mounted cabinets are off-the-shelf products for the MPR-7075C. Special cabinets may also be specified.

INTELLIGENCE

The 16 bit microprocessor has a wealth of EPROM, EEPROM, and RAM, with CMOS technology and LSI logic. Like all of our full size RTUs, the MPR-7075C goes beyond simply "hardwired" RTU emulations of the past. Some examples of the advanced capabilities are the RTU's support of special application programming, ability to use a variety of foreign vendor protocols, external "smart" device I/O interface to communicate with other intelligent devices, ad infinitum; you provide the imagination, ACS provides the technology.

MAINTAINABILITY AND RELIABILITY

The MPR-7075C is especially designed for simple maintenance with maximum reliability; in other words, lasting value to the user at a minimum recurring cost. The single board design of the RTU and limited expansion modules really simplify support. No sophisticated test equipment or special RTU training is required for the customer to become proficient with the MPR-7075C. Add to this an MS-DOS Laptop or Notebook PC with out MPR-7000 Portable Programming and Diagnostic Terminal software, isolation of a failure is more common sense oriented than ever before. With our design approach and diagnostic terminal software, you will have all you need for the life of the system to keep it on-line 24 hours a day, 7 days a week, 365 days a year.

As with all RTUs designed by ACS, routine, preventative maintenance does not exist; it's unnecessary with the MPR-7075C. Mechanical devices, such as switches, dials, and jumpers have been eliminated. Extensive adjustments of analog circuits have been replaced by laser trimmed analog devices. Since ACS burns in every RTU that we sell, we eliminate any infant mortality prone electronics that others ship. All that should be necessary with an ACS RTU is a visual inspection once a year to wipe off the dust.

MEAN-TIME-BETWEEN-FAILURE

The standard unit of reliability measurement for any electronic device is its Mean-Time-Between-Failure (MTBF); a simple measure of the average time between failures of the product. ACS takes the significance of this calculation a step further than most manufacturers. We calculate the MTBF, along with hourly, monthly, and annual reliability factors (a statistic of operating reliability measured in thousands of operating hours) on every product model installed every month. This is not just calculated from hypothetical testing data of a random sampling of product. Actual RTU operating hours experienced by our customers throughout all the environmental ranges worldwide, versus the actual failures from data supplied from our Product Repair Department provide reliable data for these calculations. This not only provides a continual monitor on the performance of each RTU model performance in real operation, but a comparative analysis of reliability between each of the RTU models manufactured.

The MPR-7075C has an MTBF in excess of 9 years (175,000 hours). Contact your local sales representative. He will be able to provide you with current monthly MTBF and Reliability statistics on the MPR-7075C Remote Terminal Unit.

MPR-7075C I/O FEATURES

STATUS MONITORING

The MPR-7075C can monitor the on/off status of 8 devices or functions with expansion to 16. Through optically isolated inputs, the RTU can rapidly scan status and alarm contacts every five milliseconds and report only the changes which have occurred since the last data request. This "poll-by-exception" method increases system speed by eliminating redundant data transmission. Status point input buffers are specifically designed to ignore transients or contact bounce and eliminate erroneous data.

STATUS MEMORY

With ACS protocol, each status point is equipped with a seven level First-In-First-Out (FIFO) memory capable of recording high speed operations, like reclosing breakers or protective relaying. Any change is recorded in this memory as it occurs and then is transmitted to the master station. The system operator not only has access to the current status of the monitored device, but may also review the sequence of momentary changes (operations) leading to the present state.

PULSE ACCUMULATION

A pair of digital inputs may be configured within the MPR-7075C RTU as an accumulator input, in single accumulator increments up to the maximum of eight. The RTU accumulates pulses from devices such as standard utility kWh pulse initiators or flow transmitters from either Form "C" or "A" contacts. Pulses are accumulated in a dedicated memory register by the microprocessor and transmits the pulse counts to the Master upon interrogation. The accumulator "FREEZE" command may be from the master station, or provided by a local contact closure. This allows the MPR-7075C accumulators to be synchronized with another system's interval. Conversely, the MPR-7075C can initiate an accumulator "FREEZE" output command to synchronize another system's accumulators to the MPR-7075C's interval.

Accumulators in the MPR-7075C RTU are programmable via the MPR-7000 Portable Programming Terminal. Each accumulator can be configured for 16 bit (32,767 counts maximum/interval), 32 bit (4,294.9 Million counts maximum/interval) or with an additional 16 bit counter that is reset by the RTU at user defined (1-60 minute) intervals. This "sliding window" count may be used as an estimate for the current instantaneous value of the parameter being monitored (i.e., kW from kWh input).

If, in the future, the required number of accumulators changes, the user can reconfigure the RTU to meet the new requirement without changing the existing hardware or software.

ANALOG MONITORING

The base MPR-7075C RTU can monitor up to 8 analog values (kW, kVAR, Volts, Amperes, Temperature, Water Pressure, etc.), expandable to a maximum of 16, which can be telemetered to the master station with 0.1% accuracy over the entire rated temperature range of the RTU.

Analog-to-digital conversion is performed to a resolution of 12 bit two's complement binary format. All inputs are fully bi-polar, configured differently, and protected to provide stable performance in adverse electrical environments.

Standard analog inputs are scaled for 0±1 milliamp full scale. Custom inputs for any other range (i.e., 4-20ma, 5-50ma, 0±5Vdc, etc.) may be specified. In cases where the overrange capability of standard electrical transducers are required for your operation (i.e., 150% of full scale for 0±1.5ma), again, these may be supplied by specifying the full scale calibration desired.

With ACS7000 Protocol, a rate-of-change deadband value may be defined for each analog point in the RTU. The deadband value defines the time and magnitude of an input change required before the RTU considers the point to have changed. The RTU calculates a change delta which is the difference between the current input value and the

value last reported to the master. The change deltas are integrated over time and compared to the deadband value. If the magnitude of the integrated changes is greater than the deadband value, the point is considered to have changed.

The analog points in the RTU may be grouped by the master in a maximum of 16 partitions. Each partition is assigned to one of 16 priority levels. If any point in the partition changes, the entire partition is considered to have changed. Each partition defines the number of points which are reported in a single data block. The priority level defines the order the analog data is reported to the master.

This poll-by-exception technique maximizes the efficiency of data gathering by limiting the data to only those inputs which have changed. It also allows a large number of MPR-7000 Series RTUs to be able to operate on a single communications channel.

ANALOG OUTPUTS

The MPR-7075C can support a maximum of four isolated 4-20ma analog outputs in increments of one on a single extension module. These outputs may be used for a variety of applications such as supplying device control setpoints and chart recorder inputs. Each output channel has its own 12 bit D/A converter. All outputs are controlled simultaneously based on setpoint values transmitted from the master station. Analog outputs may be calibrated in the field using the MPR-7000 Portable Programming Terminal.

STANDARD CONTROL OUTPUTS

The MPR-7075C base control subsystem consists of eight digital outputs with ten amp, AC rated interposing relays. Expansion to 16 control relays with mechanically latching or heavier duty momentary relays is available as an option. ACS' protocol supports the assignment of contact closure times, each defined by the user from 0.05 seconds to over 205 seconds, in 0.05 second increments, which may be selected for each momentary control operation.

Throughout ACS' 18-year history, a key philosophy regarding control has been foremost in all RTU designs: "DO NOTHING BEFORE YOU DO SOMETHING WRONG". In order to provide the security required for critical control activity, each point operates on a Select-Before-Operate control message sequence. In addition, two levels of computer controlled diagnostic checks are designed into the control subsystem to protect against false operations. If an error is detected at any stage of the control process, the sequence is halted, and the operator is alerted by a Control Failure Alarm.

A Local/Remote switch is also provided in each RTU to totally block remote control of the externally controlled devices. When the switch is placed in the local mode, an alarm is sent to the master station and all control operations are electrically and programmatically blocked. All other functions of the RTU remain fully operational.

CLOSED LOOP CONTROL

The MPR-7075C RTU has the ability to initiate, conduct, and terminate Closed Loop Control based on real-time analog or accumulator values. Up to eight simultaneous algorithms may be implemented. Each control algorithm is flexible and can be customized to a user's particular requirement with the MPR-7000 Portable Programming Terminal.

The Closed Loop Control (CLC) consist of eight separate loops, each defined by eight independent parameters. They are:

- The setpoint, downloaded from the master station.
- Upper limit; expressed as a percentage of the setpoint.
- The upper limit steps; number of times a CLC will execute if an upper limit is exceeded.
- Lower limit; expressed as a percentage of the setpoint.
- The lower limit steps; number of times a CLC will execute if a lower limit is exceeded.
- Output number; the control point associated with this CLC.
- Input type; analog, accumulator, two-minute accumulator.
- Input point number; the point location of the value in the RTU used in the CLC computation.

A common application would involve the user defining a KW demand range over which Automatic Voltage Reduction Control would occur.

```
▲ SYSTEM kW DEMAND
|
|
|
| LOWER VOLTAGE
|                UPPER DEMAND LIMIT
|
| ———— SETPOINT
|
| RAISE VOLTAGE
|                LOWER DEMAND LIMIT
|
└———————————————————————————► TIME
```

The control algorithm would automatically execute in order to maintain the system demand within the prescribed range. All parameters would be user definable as shown.

Operational control limits may be adjusted remotely by sending a new setpoint value to any or all operating CLC programs. This will allow sliding of the controlling parameters up or down accordingly with respect to the monitored value. Remotely disabling the operation of any CLC program can similarly be accomplished by transmitting a zero setpoint value. With the appropriate definition of these parameters, the user can define Closed Loop Algorithms for Voltage Regulation, Capacitor Bank Control, Water Tank Levels, etc., which will operate locally without the assistance of the system master station.

SERIAL INPUT/OUTPUT PORT INTERFACE

The MPR-7075C RTU can be equipped with a serial channel for interface with external intelligent foreign terminal devices. This channel is completely under the control of an independent microprocessor interface module with communications data formats programmable to the protocol specifications of the external Intelligent Electronic Device (IED). Some examples of current applications in ACS' protocol library:

- Cooper Power Systems intelligent Form 4C reclosers, CL-4C regulators, and LTC-4C power transformer control units
- Siemens (or GE emulation) MJ-3A regulators
- Sangamo Quantum Q200/Q300 intelligent meters
- Power Measurements, Ltd. ACM-3710 solid-state meters
- INCON 1255 Model programmable position monitors

Many application where intelligent data can be gathered or control operation accomplished from or to external devices is possible.

The advantage of these types of interface can be a substantial savings in the RTU installation. External transducers, signal conditioners or transmitters, contact wiring, etc., might be eliminated.

INPUT/OUTPUT HIGH VOLTAGE TRANSIENT PROTECTION

A major contribution to the ACS Success Story is the many reports from our customers where an ACS RTU not only survived but continued to report the results of massive failures of other electronic devices from lightning hits or high voltage ground faults in a remote substation.

All inputs and outputs of each MPR-7075C RTU are fully isolated or protected to the highest degree technically available against damage to the electronics from exposure to high voltage transients (i.e., lightning) and designed

to exceed the ANSI C37.90(a) Surge Withstand (SWC) requirements. With all ACS manufactured RTUs, it's not only a standard, but a Quality Assurance requirement at Design Certification Acceptance Testing. Documentation on actual tests performed and certification of acceptance may be reviewed by contacting your local ACS Sales Representative.

PORTABLE PROGRAMMING AND DIAGNOSTIC TERMINAL

The MPR-7000 Portable Terminal Software operates on any MS-DOS (3.0 or better) based Notebook or Laptop PC that may be operated from either an internal battery or external supplied 110/220 VAC power source. The Portable Terminal is utilized by the RTU for in-field reconfiguration or diagnostics of all MPR-7075C functions. Configuration parameters include baud rate, station address, modem type, accumulator configuration, closed loop control parameters, etc. All configuration changes may be accomplished without removing the RTU from service or disrupting operation in any way.

The MPR-7000 Portable Terminal Software is also used as a full diagnostic device for the MPR-7075C RTU. This includes on-line monitoring of various RTU real-time data or functions such as status, analog, and accumulator inputs, state and activity of the control output system, and master/RTU message traffic, with error statistics, in the communications channel. RTU configuration modifications as well as local control relay test functions are password protected to guard against unauthorized access. The terminal has a user friendly interface which guides the user through simple, single key entry, menu-driven selection of each of the configured RTU diagnostic or configuration options.

INSTALLATION

The MPR-7075C is designed with not only the site design engineer in mind, but the electrician/technician installer in the field. Installation requires only connection of user inputs and outputs. Configuring the RTU through the MPR-7000 Portable Terminal is a simple, menu prompted English language process. No binary, octal, or hexadecimal mathematical conversions are required; 1 is 1, period.

All wiring terminations are to removable, snap-off type terminal blocks which can accept a wire connection for up to #14 AWG conductors. Pull the connection block, insert the stripped wire, and lock it down.

MPR-7075C RTUs are designed to be installed outdoors; in the jungle or the arctic. Optional cabinet heaters are available where high humidity conditions exist or low operating temperature environment could exceed the minimum operating temperature; sunshield cabinets are available where the maximum could be exceeded. Of course, if you decide to install the RTU in a nice, environmentally conditioned location, it will still operate just as well.

COMMUNICATIONS CHANNEL REQUIREMENTS

The standard MPR-7075C RTU is equipped with an integral asynchronous, FSK (Frequency Shift Keyed) voice-band modem which is capable of reliable data transmission rates of up to 1200 baud (bits per second). Digital technology is employed, providing a user configurable modem which meets Bell 202 or CCITT V.23 specifications. Standard Bell 3002 or CCITT, unconditioned telephone channel (half or full duplex) specifications apply for the audio communications interface between the master and RTU.

The MPR-7075C is equipped with an isolated, solid-state, transmitter key control signal (PTT), where audio interfaced radio applications might be employed. Key up time prior to data transmission is configurable from zero to 400 milliseconds.

For external modem communications interface, the MPR-7075C is additionally provided with a digital, RS-232C interface, which can operate up to a maximum of 9600 baud. High-speed digital radio, fiber optic links, digital telephone channels, etc., may be interfaced and configured without modifying the standard MPR-7050C communications interface.

Because of the on-board FSK modem and the sophisticated digital interface capabilities, communications between the master and RTU may be quite varied. Typical link methods are leased telephone line (high-speed digital or two

or four-wire voice grade), UHF/VHF audio or digital interfaced radio, power line carrier, microwave, shielded pair, cable TV, or fiber optics.

COMMUNICATIONS MESSAGE SECURITY

As the number of functions dedicated to a SCADA, DMS, or EMS system increases, and as faster communication rates are used, the requirement of safeguarding the transmitted data from damaging effects of noise on the communications channels becomes more critical. The level of message security along with total number of RTUs that can be addressed on a single channel is determined by the structure of the communications protocol used.

With ACS systems configured with ACS7000 Series Protocol, the master station continuously interrogates each remote terminal for any changes on monitored status inputs and any changes beyond the customer's specified limits for each analog data value. The ACS7000 protocol is a poll-by-exception, byte oriented, asynchronous protocol, consisting of a variable length message structure. This protocol was specifically developed by ACS for both efficiency and maximum message security with the ability to be fully compatible with modern, digitally encoded, communications systems. Message validity/error detection is accomplished by a 16 bit Cyclic-Redundancy-Coded (CRC) security technique known as CRC-16 (CCITT CRC-16). The CRC is calculated on all bytes of the message. A complete poll of all data from each RTU on the system is periodically performed.

The ACS7000 Protocol can support a maximum of 32766 unique RTU addresses.

A power sixteen primitive message generator polynomial of $x^{16}+x^{15}+x^{2}+1$, using sixteen of the transmitted message bits, provides a security of 100% of all error bursts of 16 bits or less. It will additionally detect over 99.9% of error bursts of greater than 16 bits. With standard voice grade communications channels, the overall detection of any error condition will be much better than 99.9% effective.

In addition, the data messages themselves are carefully tested for correctness of content by both the RTU and Master Station, using an echo technique. This additional security measure will not permit an improperly formatted message to pass, even if the security test indicates a mathematically correct message has been received. ACS uses pretransmission conditioning of any audio communications channels prior to message transmission to settle the inherent noise.

All these methods combine to make the ACS-7000 protocol a highly secure and efficient means of communicating data within the system no matter which communications methods are selected.

CERTIFIED FACTORY TESTING AND QUALITY ASSURANCE

All products manufactured by Advanced Control Systems, Inc. are subjected to stringent Quality Assurance inspection and production test procedures. Each RTU requires five individual levels of certified test:

1. Individual I/O module pre-stage test
2. RTU Pre-burn-in design and equipped point and functional test
3. Full operational burn-in test at 60°C (145°F) for a minimum of 72 hours
4. Post-burn-in point and functional testing to the equipped configuration
5. Quality Assurance selective test audit and visual inspection

Individual RTU Production/Quality Assurance Test checksheets are available on demand on every product manufactured. Customer witnessing of final Quality Assurance testing/certification of each lot is welcomed or the certified documentation on each unit will be supplied on request.

MPR-7075C SPECIFICATIONS

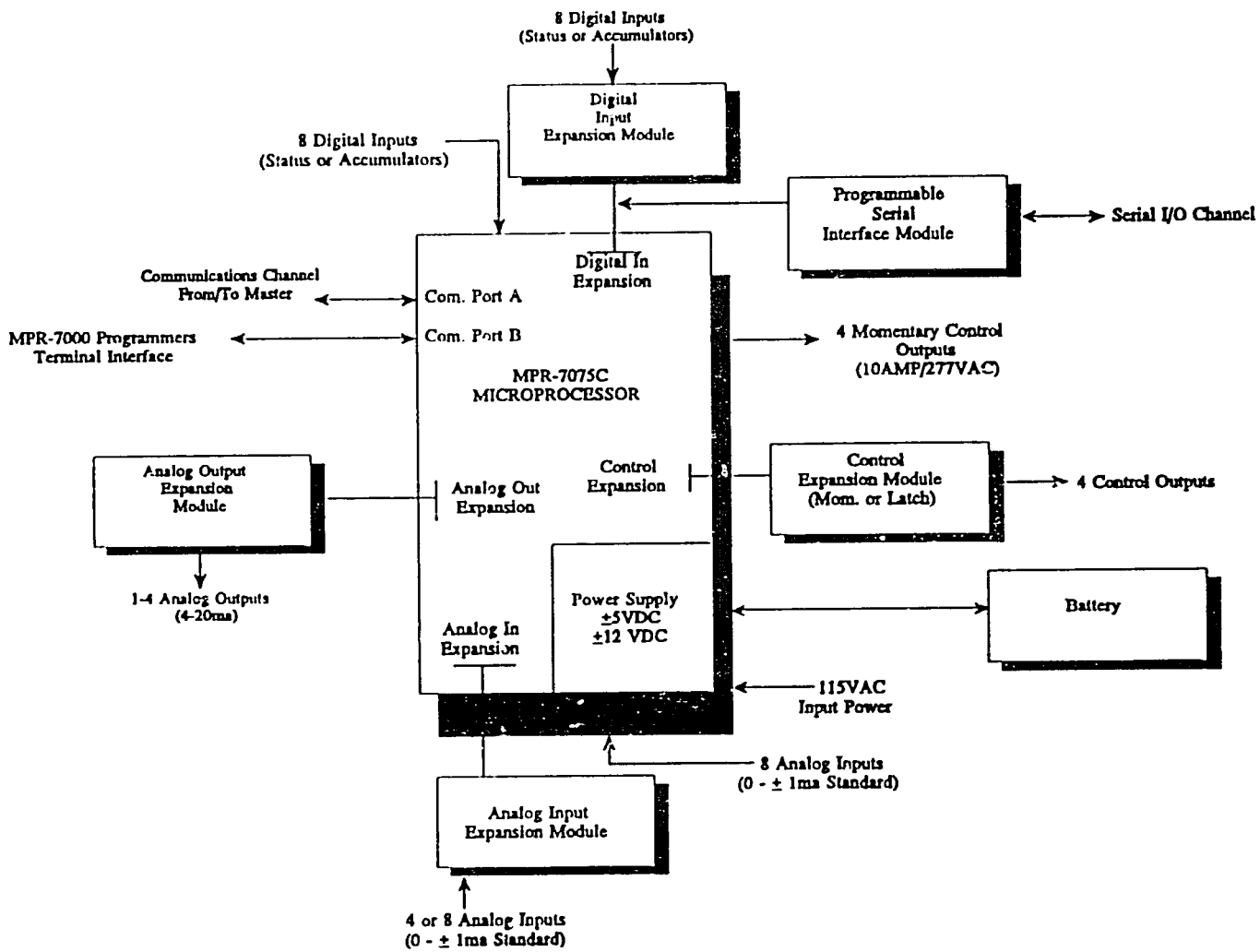
Microprocessor:	
CPU	80C188
RAM	32Kbytes
EPROM	128Kbytes (max.)
EEPROM	2048 Bytes
Cycle time	7.3728MHz
Status Inputs:	
Base Capacity	8 digital inputs
Maximum capacity	16 status points per RTU (if no accumulators)
Scan period	5 milliseconds
Input isolation	Optically isolated
With ACS7000 Protocol:	
Poll method	Poll-by-exception
Status memory	All status points have a 7-level memory
Pulse Accumulation:	
Maximum capacity	Up to 8 pulse counter inputs (if no status points)
Input isolation	Optically isolated
Freeze Command	From master or external contact input. Output contact provided on any freeze.
Register size	16 or 32 bit
Auxiliary Register	16 Bit at user definable intervals (1-60 min.)
Control Features:	
Base Capacity	8 control relays.
Maximum capacity	16 control relay outputs)
Contact types	Momentary or latching
Control sequences	Select-before-operate
Contact ratings	Standard- 10A, 277VAC Optional 10A, 150VDC, 25A, 150VDC
Analog Inputs:	
Base Capacity	8 analog points
Maximum capacity	16 analog points per RTU
Analog inputs	±1mA current source inputs (standard)
Analog accuracy	0.1% (0-60°C)
Multiplexing hardware	All solid-state (CMOS FET)
With ACS7000 Protocol:	
Poll Method	Poll-by-exception (definable by both rate and magnitude of value changed)
Analog Partitions	16 (definable by point)

Analog Outputs:	
Maximum capacity	4 isolated analog output points per RTU
Analog outputs	4 to 20ma, isolated
Analog accuracy	0.1% (0-60°C)
Communications Subsystem:	
Communication channel	With internal FSK modem: Unconditioned voice grade, or equivalent. Digital RS-232C interface for external modems
Operation channel	Two- or four-wire (selectable)
Modulation scheme	Asynchronous FSK
Baud rate	300 to 1200 baud with internal modem, 2400, 4800, 9600 baud with external modem (selectable)
With ACS7000 Protocol:	
Message security	CCITT CRC-16
Message structure	Byte oriented, variable length message packets
Power Requirements:	
Input voltage	120VAC, 220VAC, 12VDC
Power consumption	12 watts, typical
Cooling	Unrestricted air flow
Internal battery backup	2 hours, auto-failover (optional)
Surge Protection:	
Inputs and outputs	IEEE SWC protected (ANSI Std. C37.90(a))
Enclosures:	
Enclosure options	Various size NEMA 4 cabinets
Operating Range:	
Operating temperature	0°C to +60°C
Operating temperature with heater option	-30°C to +60°C
Humidity	10% to 95% non-condensing

Options:
Portable PC Programming Terminal Software
Thermostatically Controlled Heaters
RS-232 Port, for Interface with Intelligent Electronic Devices
Custom Enclosures
Custom Relay Configuration
Other Vendor Protocols

Revision: September, 1993

MPR-7075C RTU BLOCK DIAGRAM



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ALLIGATOR COMMUNICATIONS, INC., MAS RADIO

Alligator Remote MAS Radios offer "Over-theAir" monitoring and control

Alligator's new 1888 series MAS frequency synthesized remote radios offer unprecedented "Over-the-Air" monitoring and control. The radio is designed to offer the maximum performance and reliability in a multiple address communications network. The radio utilizes an onboard microprocessor to control all operational parameters and diagnostic functions.

"What is 'Over-the-Air' monitoring and control?"

Thanks to a combination of an onboard microprocessor and the industry's most advanced diagnostic software, Alligator Model 1888 remote radios can communicate directly with a PC computer. Using the Alligator software, the computer can monitor and/or change any of the radio's diagnostic and operating parameters. Best of all the computer does not need to be directly connected to the radio. The computer can communicate with the radio's microprocessor via its RF path. Therefore, a PC connected to a MAS master station can communicate with each Model 1888 radio responding to that master. The entire network of radios can be monitored and re-configured from one central location.

Alligator even offers a series of interface modules that enable the diagnostic PC to connect to the master station by microwave link, telephone land lines, or cellular telephone service. A technician can monitor an entire network from his own desk or even his own home.

"How does 'Over-the-Air' control save money?"

The most obvious saving comes from reducing the number of visits to remote radio sites. Radio sites are not easily accessible. If they were there would not be a radio there in the first place. Therefore, getting to a site can be expensive and time consuming. For instance, if some sites are accessible only by helicopter then just traveling to each site may cost more than the radio equipment located there.

Alligator remote radios help reduce costly trips to remote sites. The Model 1888 radio offers a couple of features that simplify system maintenance. A frequency fine tune feature is available that allows calibration of the remote radio's frequency offset. Yearly visits to remote sites for re-calibration are a thing of the past. A deviation fine tune feature is also available. This feature helps a system stay within the FCC bandwidth requirements, even if external audio levels change over time. A remote Tx power output adjust feature is also available. This feature allows a system to take advantage of optimal transmission conditions and lower the remote's power output. This will conserve battery life at any unpowered sites. If the conditions worsen just boost the power again.

The Model 1888 also offers a number of features that aid diagnosing sources of error. The Alligator diagnostic software can monitor 8 different diagnostic parameters on each radio; including Received Signal Strength, Power Supply Voltage, and Reverse Power. The software can monitor one radio continuously in real-time or a group of radios, displaying the results in an easy to read tabular format. Pin pointing potential problems is quick and easy.

Alligator radios also offer a group of programmable alarm limits. The radio has high and low limits for almost all of the diagnostic parameters. These limits define the boundaries of acceptable operation. If a diagnostic parameter exceeds one of its defined limits the radio will generate an alarm. The diagnostic computer will report this alarm the next time it polls the radio. Or, the connected RTU can report the existence of an alarm condition to the host SCADA computer. Radios experiencing marginal performance can be detected almost immediately. Also a group of event counters is available to help pinpoint intermittent transmit or lock on transmit errors.

Alligator radios help reduce costly trips to remote radio sites.

Another feature of the Model 1888 is Alligator's ability to upgrade the radio in the field. Because almost all of the radio's logic is controlled by the microprocessor, Alligator is able to dial-up a radio and upgrade its optional features. There is no need to remove the radio from the site. Alligator simply calls the system's master station and uploads the upgrade information to each remote. Using this dial-up feature, the factory can provide enhanced maintenance support by telephone. *

Alligator
Communications, Inc.

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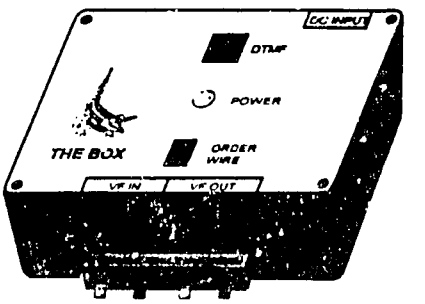
Alligator Interface Modules

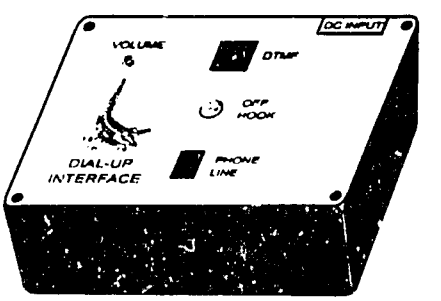
"The Box" Interface Module
Part no. 4000-0003

"The Box" interface module converts the unbalanced input/output signals used by the PC to DTMF Converter into a pair of balanced signals with programmable input and output voltage levels. Using one of these modules, the diagnostic PC can communicate with Alligator remote radios through any manufacturer's master station. Using two of these modules, the diagnostic PC can communicate with a master station via a standard microwave link. The module also provides a link for automated factory assistance and upgrades by phone.



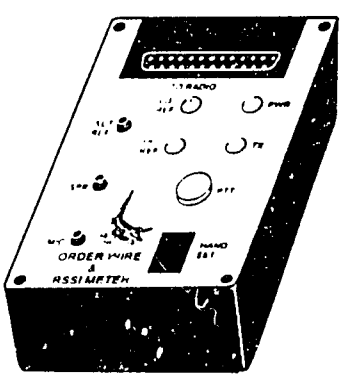
Dial-up Interface Module
Part no. 4000-0004

The dial-up interface module connects a PC computer running the **Alligator Advanced Diagnostics Software** to a phone line . Using this phone connection and the **ALLI** software, the PC can call a Model 1800 master station equipped with the auto-answer option and communicate with it and each of its remote radios. While connected by phone, the ALLI software can perform virtually all of its diagnostic functions. The interface's small size makes it a perfect for use with either a desktop or a portable notebook computer.



Order Wire Interface and RSSI Meter
Part no. 4000-0005

The Order Wire Interface and RSSI Meter assists the technician installing and maintaining Alligator Model 1888 remote radios. First, the module provides an order wire (handset) interface and a PTT key for voice transmission. Enabling the technician to test the RF link from the remote site. Second, the module provides an adjustable RSSI meter to help align directional antennas.



Dimensions of all above modules: 4" × 3" × 1½"

Alligator
Communtications, Inc.

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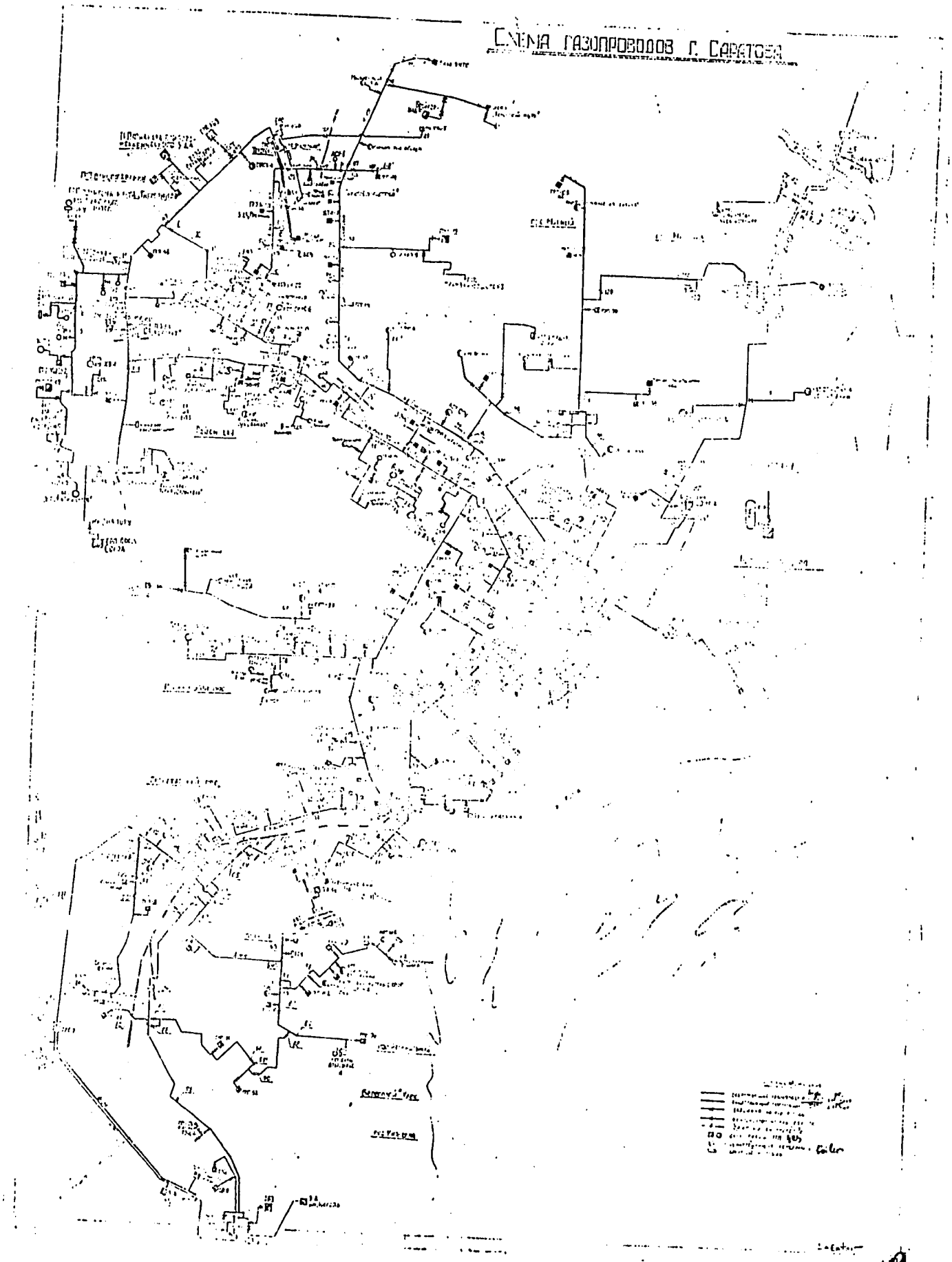

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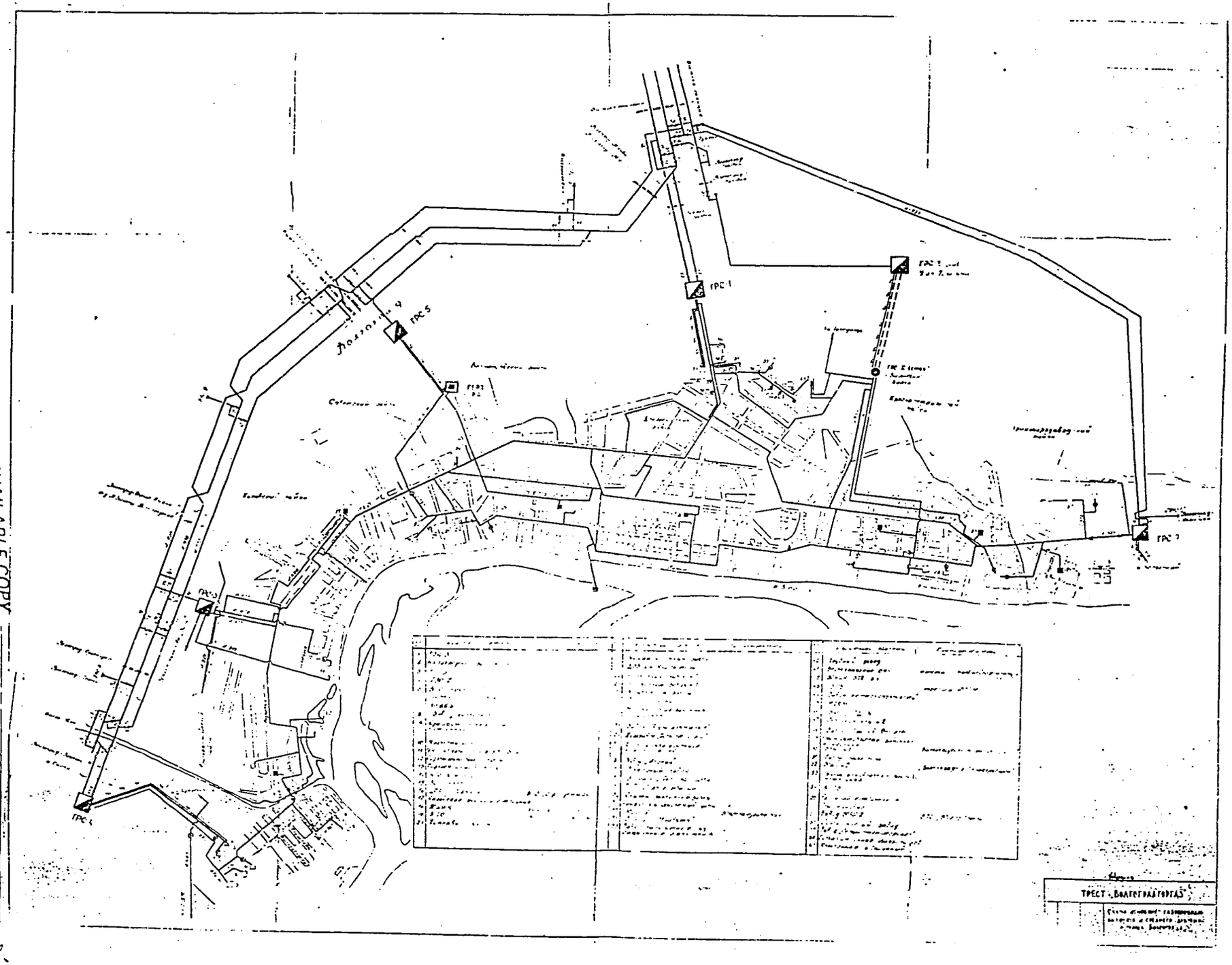

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Appendix 4-B

PROCUREMENT

I. Information Sources

The information presented in this report was derived from three main sources described below:

A. Giproniigas - The Gas Institute provided information and assistance in several difference areas:

1) Provided a list of suppliers and materials and equipment used in Gas Distribution.

2) Confirmed that "Standards" or specifications for materials and equipment used in gas distribution do exist. A translated copy of all such standards was requested from Giproniigas.

3) Provided some assistance in arranging for interviews with suppliers listed in the "Materials and Equipment Used in Gas Distribution" list in the four cities visited.

4) Provided information on specific materials and equipment in interviews with appropriate Giproniigas personnel.

B. Gorgas

1) Provided information regarding materials and equipment used by them in the distribution of gas in the 4 cities, including questions on any significant shortages, spare parts support, methods of purchase and payment, transportation and/or other problem areas.

2) Provided assistance in arranging interviews with suppliers in their cities which appeared on the "Suppliers List" provided by Giproniigas. They were also requested to arrange for visits to any other suppliers they used which did not appear on the list.

C. Suppliers

1) Interviews with suppliers regarding the products they manufacture used the attached questionnaire.

2) Questioned suppliers regarding any shortages of raw materials, transportation, financial methods, spare parts support of their products and maintenance and warranty support. Also discussed methods of payments and their willingness to upgrade quality of their products either directly, through joint ventures with outside companies, or by license from foreign companies.

II. General Statement on Russian Suppliers

There was a high degree of consistency in the information received from Giproniigas, Gorgas and the suppliers in all 4 cities visited. In general, with a few exceptions, all agreed that shortages of material and equipment were determined mainly by the availability of funds to purchase them. Other areas of agreement were:

A. Method of Payment

In almost every case, the Gorgas concurred and the suppliers interviewed stated that providers of goods and services required payment in advance before any such goods or services were made available for shipment.

B. Transportation

The standard shipping terms are "FOB Seller's Plant" with the buyer arranging the pick up and delivery. In a few cases, a "Prepay and Add" the cost of shipping to the Seller's invoice was used.

C. Pricing

Detailed information on pricing was collected by John Spowart of Estimating. However, all parties interviewed indicated that due to "galloping inflation," prices were changing very rapidly with some commodities indicating a change every 10 days.

D. Use of "Middlemen"

Almost all interviews noted that the use of "middlemen" to purchase material and equipment was increasing. Most Gorgas's and factories interviewed stated their preference to deal directly with suppliers but stated that the number of "middlemen" is growing. Sellers find it more profitable to deal with middlemen than to deal directly with buyers.

E. Spare Parts

Spare parts for equipment presents some problems. Spares for foreign made equipment are of particular concern. Foreign suppliers require payment in hard currency which is in very short supply. In some cases, foreign made equipment requiring spare parts is scrapped and replaced with Russian made equipment for which spares are available.

Spares for Russian made equipment appear to be spotty according to several interviewees. In several factories, we were told that if spares were required, finished units were cannibalized to provide them. Any warranty work to be done was only performed if the buyer returned the unit to the factory at his expense.

F. Bidding Practices

In most cases described to us, buyers dealt with established suppliers on a negotiated price basis rather than on a formal competitive bid basis. To use this type of bidding would require some education.

G. Conversion of Military to Civilian Production

Many of the interviewees stated that as more military plants covert to civilian production, many of the shortages of material noted in the past are disappearing. Whether all of these plants will survive is questionable, however.

H. Willingness of Suppliers to upgrade quality or provide new products

Most of the companies interviewed indicated a willingness to upgrade quality or provide new products directly or through joint venture. Most appeared eager to obtain funds from foreign sources in order to provide new and better products.

III Commodities

A. Pipe, Valves, Fittings, Regulators

1) Steel Pipe - Not now in short supply but the effect of large orders for specific sizes if large scale replacement of gas pipe were recommended would have to be analyzed.

2) Steel Fittings - Most interviewees stated that no shortages exist but we noted that the Gorgas organization visited appeared to be fabricating their own fittings. When questioned, they stated that the reason for doing this was cost, not availability.

3) Regulators - At the present time, it appears that no shortages exist. The conversion of military to civilian production has increased the number of factories able to produce these items.

4) Polyethylene Pipe

The information on this material was prepared based on several interviews with Mr. Ginnady Kaigorodov, Giproniigas Laboratory Chief. Additional information has been requested from the Kazan plant discussed below.

There are, at present, two plants in Russia which are or soon will be producing raw material for polyethylene pipe. These are:

"Orgsynthesis" in Kazan. This plant makes raw material and pipe and fittings (low pressure, high density). It provides approximately 200,000 tons of raw material per year, of which 25,000 tons are used to make Polyethylene pipe for gas use in sizes from 63mm to 225mm.

"Stavropolina Plant" in the Stavropol area. This is a plant which has been rebuilt in conjunction with British interests. It is scheduled to be on line in September of 1993. Its capacity is said to be 100,000 tons of raw material per year. This plant will produce only raw material suitable for the fabrication of low pressure, medium density pipe. Plans are for it to produce approximately 25,000 tons per year for gas pipe fabrication.

When the Stavropol plant comes on line, the combined production of it and the Kazan plant should produce a total then of 50,000 tons of raw material for gas pipe per year. Per Mr. Kargorodov, this amount should be "sufficient to satisfy Russian needs for P.E. gas pipe." This is based on the current requirements for new construction and replacement. The bulk of the requirement is for new construction. In the Saratov area for instance, 97% is for new construction, 3% for replacement.

Pipe fabricating plants for Polyethylene pipe have been built in the Ryazan area, St. Petersburg, and the Saratov area. All of the plants will be able to produce P.E. pipe once the Stavropol plant begins producing raw material. Pipe will range in size from 3/4 inch to 9 inch.

The Ryazan plant is ready now and only needs raw material to begin production of pipe. This plant produces only pipe, no fittings.

The St. Petersburg plant is scheduled to be complete before the end of 1993 and will only produce pipe.

The Saratov area plant is scheduled to produce only pipe by January 1994.

5) Polyethelene Fittings

Fittings for P.E. pipe are produced in the Kazan plant but are considered to be "outdated" per Mr. Kargorodov. He stated that the problem is that the machinery producing the fittings is old and the fittings are of poor quality. Some sizes of fittings are not available due to the fact that the pressure molds needed to make them are worn out. Mr. Kargorodov noted that the shortage of suitable P.E. fittings for gas use is considered to be a "big problem."

Mr. Kargorodov estimates that 25 machines for producing fittings are required to produce sufficient fittings to satisfy requirements. Cost of these machines is estimated to be $US 300,000 each.

Current plans are to produce fittings, using these 25 machines, in a plant in the Saratov area sometime in 1994 or 1995.

6) Corrosion Protection Devices and Materials

a) Coating and wrapping - the standard practice for coating and wrapping of pipe, observed in the factories in Volgograd and Voronezh, is 1 coat of hot bitumen, 2 wraps of fiber glass and one wrap of Kraft paper. There appears to be sufficient capacity to handle current needs.

b) Electrical devices - several plans, including one visited in the Ryazan area, make several types of cathodic protection devices. They claim to be filling all current demand.

7) Meters

a) Residential - In addition to the meters produced by Technogaz described in other documents, several suppliers and potential suppliers where interviewed. "Signal Co." of Saratov produces a model which they claim to be equivalent to the Technogaz model for about half the cost. The Almaz Co. of Saratov intends to produce an electronic meter as compared to the mechanical meters from Technogaz and Signal for approximately the same cost as the mechanical meters. Other companies have indicated their willingness to produce similar residential meters.

b) Industrial - Several companies produce these meters now, including Signal Co. of Saratov. Conversion of military to civilian production has led to several companies producing this type of meter. Shortages noted in the past have now largely disappeared.

8) Gas Appliances

Stoves - Per Dr. Golek of Giproniigas Gas - previous shortages of stoves have largely disappeared due to large numbers of new manufacturers (former military plants) entering the market. Visits to several stove factories indicate that they are not producing to full capacity.

Hot water/space heaters - used mainly in private homes. No hard figures on shortages. Numerous suppliers including 3 which we visited.

Appendix 4-C

CONSTRUCTION OPERATIONS AND RELATED DATA

4-C.1 CONSTRUCTION MACHINERY OWNED BY EACH GORGAS

A. Excavator "30-26-31"/machine "back-hoe type" .5 cm

B. Excavator "Belonus"/machine "back-hoe type" .75 cm

C. Truck crane "Hydrolic"/machine "14 ton"

D. Compressor "3VA-55" 3 machines "size n/a"

E. Welding trucks "3VA-737" 2 machines "size n/a"

4-C.2 REGULATIONS & SPECIFICATIONS

A. Giproniigas Institute responsible for standards in conjunction with Russia Gasifilotion Construction administration and Obalgas.

B. Gorgas responsible for application of standards and to oversee quality control in new enterprise construction of gas lines/lack of quality control apparent.

C. New construction of gas lines are installed by private enterprise, who absorbs all cost including materials. Also standards set down by Giproniigas but not obligated/responsible for their own quality control. Lack of quality control.

D. After construction of new lines Gorgas makes arrangements with enterprise for maintenance but is not completely responsible for all maintenance. Gorgas will maintain unless cost becomes substantial, then Gorgas consults.

E. Gorgas is not equipped to install lines larger than 20-inches. They use only factory bends to elevations. Gorgas has no bending equipment except for 2" or below. All bends are mitered to fit.

F. Special forms are submitted by Gorgas to Giproniigas Institute for leaks, injuries, etc., once a month. Reasons for cause of leaks are then determined by Institute.

G. Average leaks reported are 5 or 6 per city.

4-C-3 CONSTRUCTION OF UNDERGROUND NETWORKS

A. Municipal City Council is responsible for contracting all underground utilities before construction begins. The Council works in conjunction with the Oblast Trust.

B. Municipal Administration also approves excavation, traffic detours, etc.

C. Fines are levered against utilities that dig into and damage another utility by the State Technical Supervision Department of Gas. Also utilities are subject to incur all cost of repairs.

D. System is complicated and seems to be somewhat ineffective.

4-C.4 RECOMMENDATIONS ON CONSTRUCTION MACHINERY: ITEM 1

A. Recommend: Rubber tire hoes (equivalent to 426 or 446 cat with Extenda-Hoe and 1-1/2 yard front bucket, all axle drive for all weather conditions, mobile for city work (transport not necessary). 2 ea.

B. Recommend: Boom truck with 26' flat bed, 18 ton crane, 3 axle truck. 1 ea.

C. Recommend: Compressor, large enough to test lines and run all types of hand tools, including jackhammers and impacts. 2 ea.

D. Recommend: Welding machine, trailer type to be pulled by any vehicle. 2 ea.

E. Recommend: Preventive maintenance program for all equipment.

F. Recommend: Training program for all new equipment operation and safety.

G. Recommend: Training for new methods of pipeline installation.

4-C.5 CONSTRUCTION/OPERATION MAINTENANCE (HAND TOOLS) AND EMERGENCY RESPONSE

A. Recommended tools for each vehicle maintenance and emergency response:

1. Gas wrenches, No. 3 & 4 - 2 per vehicle.
2. Drilling tool kit - 1 per vehicle; pick, wedges, sledge hammer, dry bar - 1 per vehicle.
3. Crowbar, sharp shooter, shovel, hook for opening manhole covers, warning cones, rope, 30 pound fire extinguisher, assorted sizes of plugs, ground jumpers, work lights, pressure gauges, explosion-proof head lamps, hard hats, gas analyzer, masks and hoses, safety belts with rope, ladder, first aid kits - 1 ea. per vehicle.

B. Update radio station, radio telephone (all vehicles), gas analyzers, gas detectors.

C. Recommend: Medic first aid - Basic (CPR/First Aid) training program for all Gorgas personnel.

D. Recommend: Safety program to cover all aspects of gas pipeline installation and maintenance.

E. Recommend: Barricades for open ditch and any construction site with Gorgas colors.

F. Recommend: Pipeline warning signs installed throughout city with emergency phone number for Gorgas.

4-C.6 CONSTRUCTION MAINTENANCE EQUIPMENT

A. Update hand tools (safety, maintenance, construction).

B. Update vehicles (gang trucks, jeeps, emergency response).

C. Update heavy equipment (construction, maintenance).

D. Update safety equipment (tools, barricades, emergency response).

E. Update welding equipment and procedures (welders, trucks, tools).

F. Update X-Ray equipment (lab, tools).

G. Introduce new equipment (bending, man lifts, drill rigs).

4-C.8 EMERGENCY RESPONSE TEAM

A. Update radio telephones in all vehicles.

B. Update gas analyzers, gas detectors, line locators.

C. Recommend: Medic first aid (CPR) training program.

D. Update vehicles (unless vehicles are used in maintenance-recommended updating already).

E. Note: All tools recommended to be updated already.

F. Train maintenance department in conjunction with fire brigade for fire control and prevention.

G. Recommend: Warning signs, barricades, markers.

4-C.9 QUALITY CONTROL

A. Introduce: New welding techniques, X-ray, line-up clamps, cutting bands, etc.

B. Introduce: Quality control program in maintenance department to ensure welding procedures are adhered to.

C. Recommend: New standards for testing all pipe welds and X-ray techniques.

Cash Flows and Rate-of-Return Calculations - Gorgas Projects

Industrial gas price, 1993$/mcm	20	30	40	40	40	40	40
Residential gas price, 1993$/mcm	3	6	12	24	48	96	150
Calendar Year	1994	1995	1996	1997	1998	1999	2000
Meters, Commercial							*
Ryazan, Cash Flow, 1993 $000	-213	-244	-200	-15	144	144	144
Project Costs	-213	-244	-200	-15			
Gas Saved, mcm					3610	3610	3610
Saratov	-385	-268	-346	-47	895	895	895
Project Costs	-385	-268	-346	-47			
Gas Saved, mcm					22380	22380	22380
Volgograd	-337	-173	-273	-45	963	963	963
Project Costs	-337.0	-172.6	-272.6	-45.5			
Gas Saved, mcm					24075	24075	24075
Voronezh	-298	-98	-216	-45	911	911	911
Project Costs	-298	-98	-216	-45			
Gas Saved, mcm					22775	22775	22775
	IRR	PV @ 15%	pvB/pvC	Cost	Gas Svd		
Ryazan	15%	-10	0.94	671	3,610	15%	
Saratov	41%	2,303	7.99	1,046	22,380	41%	
Volgograd	49%	2,701	10.37	828	24,075	49%	
Voronezh	54%	2,691	11.39	657	22,775	54%	
Meters, Private Homes w. Space Heat							
Ryazan, Cash Flow, 1993 $000	-196	-448	-374	-30	491	982	1,534
Project Costs	-196	-448	-374	-30			
Gas Saved, mcm					10227	10227	10227
Saratov	-515	-1,184	-987	-79	1,296	2,592	4,050
Project Costs	-515	-1,184	-987	-79			
Gas Saved, mcm					27000	27000	27000
Volgograd	-583	-1,342	-1,118	-90	1,469	2,938	4,590
Project Costs	-583.3	-1,341.9	-1,118.5	-89.7			
Gas Saved, mcm					30600	30600	30600
Voronezh	-759	-1,748	-1,457	-117	1,913	3,826	5,979
Project Costs	-759	-1,748	-1,457	-117			
Gas Saved, mcm					39857	39857	39857
	IRR	PV @ 15%	pvB/pvC	Cost	Gas Svd		
Ryazan	48%	3,774	23.11	1,049	10227	48%	
Saratov	48%	9,966	23.68	2,765	27000	48%	
Volgograd	48%	11,295	23.69	3,133	30600	48%	
Voronezh	48%	14,989	23.70	4,081	39857	48%	

* All cash flows constant from 2000 to 2015. Numbers rounded in printing from spreadsheet.

Cash Flows and Rate-of-Return Calculations - Gorgas Projects

Industrial gas price, 1993$/mcm	20	30	40	40	40	40	40
Residential gas price, 1993$/mcm	3	6	12	24	48	96	150
Calendar Year	1994	1995	1996	1997	1998	1999	2000
Meters, Apartment Blocks							
Ryazan, Cash Flow, 1993 $000	-1,606	-3,223	-2,596	-148	719	1,437	2,246
Project Costs	-1,606	-3,223	-2,596	-148			
Gas Saved, mcm					14,971	14,971	14,971
Saratov	-1,454	-2,898	-2,334	-133	1,220	2,440	3,813
Project Costs	-1,454	-2,898	-2,334	-133			
Gas Saved, mcm					25,421	25,421	25,421
Volgograd	-1,494	-2,983	-2,402	-137	1,256	2,512	3,925
Project Costs	-1,494	-2,983	-2,402	-137			
Gas Saved, mcm					26,169	26,169	26,169
Voronezh	-2,712	-5,590	-4,502	-256	1,177	2,354	3,678
Project Costs	-2,712	-5,590	-4,502	-256			
Gas Saved, mcm					24,523	24,523	24,523
	IRR	PV @ 15%	pvB/pvC	Cost	Gas Svd		
Ryazan	17%	1,135	2.10	7,573	14,971	17%	
Saratov	27%	6,412	3.96	6,818	25,421	27%	
Volgograd	27%	6,603	3.96	7,016	#REF!	27%	
Voronezh	17%	1,381	2.00	13,060	24,523	17%	
Meters, Industrial Upgrade							
Ryazan, Cash Flow, 1993 $000	-427	-640	-502	-8	766	766	766
Project Costs	-427	-640	-502	-8			
Gas Saved, mcm					19151	19151	19151
Saratov	-1,390	-2,087	-1,639	-29	1,074	1,074	1,074
Project Costs	-1,390	-2,087	-1,639	-29			
Gas Saved, mcm					26850	26850	26850
Volgograd	-1,001	-1,503	-1,180	-21	1,187	1,187	1,187
Project Costs	-1,001	-1,503	-1,180	-21			
Gas Saved, mcm					29682	29682	29682
Voronezh	-1,045	-1,570	-1,233	-22	1,415	1,415	1,415
Project Costs	-1,045	-1,570	-1,233	-22			
Gas Saved, mcm					35377	35377	35377
	IRR	PV @ 15%	pvB/pvC	Cost	Gas Svd		
Ryazan	29%	1,459	4.93	1,577	19151	29%	
Saratov	14%	-168	0.90	5,145	26850	14%	
Volgograd	21%	1,311	2.57	3,704	29682	21%	
Voronezh	23%	2,039	3.24	3,870	35377	23%	

* All cash flows constant from 2000 to 2015. Numbers rounded in printing from spreadsheet.

Cash Flows and Rate-of-Return Calculations - Gorgas Projects

Industrial gas price, 1993$/mcm	20	30	40	40	40	40	40
Residential gas price, 1993$/mcm	3	6	12	24	48	96	150
Calendar Year	1994	1995	1996	1997	1998	1999	2000
Cathodic Protection							
Ryazan (Investment &Cash Flow)	-439.1	-1848.2	-2548.1	-1485.1	5,099	5,105	5,105
System Replacement Cost	151,968						
Deferred Maintenance w. 60 yr life					5,066	5,066	5,066
Electric Power Savings					33	39	39
Saratov	-758	-3,114	-4,418	-2,576	5,457	5,467	5,467
System Replacement Cost	162,070						
Deferred Maintenance w. 60 yr life					5,402	5,402	5,402
Electric Power Savings					55	65	65
Volgograd	-836	-3,427	-4,875	-2,842	13,312	13,330	13,330
System Replacement Cost	396,391						
Deferred Maintenance w. 60 yr life					13,213	13,213	13,213
Electric Power Savings					99	117	117
Voronezh	-1,157	-4,700	-6,710	-3,910	10,295	10,305	10,305
System Replacement Cost	307,230						
Deferred Maintenance w. 60 yr life					10,241	10,241	10,241
Electric Power Savings					54.5	64.4	64.4
Savings factor on deferred maint.	30						

	IRR	PV @ 15%	Cost
Ryazan	48%	13,578	-6,320
Saratov	34%	11,759	-10,866
Volgograd	59%	38,546	-11,981
Voronezh	40%	24,895	-16,476

Network Analysis							
Ryazan, Cash Flow, 1993 $000	-179	-198	-175	-175	507	507	507
Project Cost	-179	-198	-175	-175			
Savings on deferred maintenance					507	507	507
Saratov	-179	-198	-175	-175	540	540	540
Project Cost	-179	-198	-175	-175			
Savings on deferred maintenance					540	540	540
Volgograd	-179	-198	-175	-175	1,321	1,321	1,321
Project Cost	-179	-198	-175	-175			
Savings on deferred maintenance					1,321	1,321	1,321
Voronezh	-179	-198	-175	-175	1,024	1,024	1,024
Project Cost	-179	-198	-175	-175			
Savings on deferred maintenance					1,024	1,024	1,024

	IRR	PV @ 15%	Cost
Ryazan	39%	1,255	-727
Saratov	41%	1,373	-727
Volgograd	69%	4,109	-727
Voronezh	60%	3,068	-727

* All cash flows constant from 2000 to 2015. Numbers rounded in printing from spreadsheet.

Cash Flows and Rate-of-Return Calculations - Gorgas Projects

Industrial gas price, 1993$/mcm	20	30	40	40	40	40	40
Residential gas price, 1993$/mcm	3	6	12	24	48	96	150
Calendar Year	1994	1995	1996	1997	1998	1999	2000
Test Equipment							
Ryazan, Cash Flow, 1993 $000	-253	-201	0	0	0	0	0
Saratov	-206	-154	0	0	0	0	0
Volgograd	-528	-476	0	0	0	0	0
Voronezh	-371	-319	0	0	0	0	0
SCADA System							
Ryazan, Cash Flow, 1993 $000	-153	-197	-1232	-1870	0	0	0
Saratov	-156	-185	-3989	-3017	0	0	0
Volgograd	-165	-243	-2874	-4595	0	0	0
Voronezh	-159	-220	-3001	-1917	0	0	0
Gas Meter Test Equipment							
Ryazan, Cash Flow, 1993 $000	-111	-59	0	0	0	0	0
Saratov	-111	-59	0	0	0	0	0
Volgograd	-111	-59	0	0	0	0	0
Voronezh	-111	-59	0	0	0	0	0
Pipe Replacement							
Ryazan, Cash Flow, 1993 $000	0	0	-165	-165	0	0	0
Saratov	0	0	-330	-330	0	0	0
Volgograd	0	0	-330	-330	0	0	0
Voronezh	0	0	-189	-189	0	0	0
Environmental Management							
Each City	-39	-27	-5	-5	-5	-5	-5

* All cash flows constant from 2000 to 2015. Numbers rounded in printing from spreadsheet.

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Cash Flows and Rate-of-Return Calculations - Gorgas Projects

Industrial gas price, 1993$/mcm	20	30	40	40	40	40	40
Residential gas price, 1993$/mcm	3	6	12	24	48	96	150
Calendar Year	1994	1995	1996	1997	1998	1999	2000
Cash Flow all projects, 1993 $000							
Ryazan	-3,618	-7,086	-7,796	-3,900	7,720	8,936	10,296
Saratov	-5,193	-10,174	-14,223	-6,391	10,478	13,004	15,835
Volgograd	-5,273	-10,430	-13,233	-8,240	19,504	22,246	25,312
Voronezh	-6,830	-14,528	-17,488	-6,637	16,731	19,831	23,308
	IRR	PV @ 15%	Cost				
Ryazan	28%	18,346	-22,400				
Saratov	27%	26,378	-35,982				
Volgograd	38%	58,589	-37,175				
Voronezh	30%	44,672	-45,482				
Cash Flow, All Metering Projects							
Ryazan	-2,442	-4,556	-3,671	-200	2,120	3,329	4,690
Saratov	-3,744	-6,437	-5,306	-288	4,485	7,002	9,832
Volgograd	-3,415	-6,000	-4,973	-293	4,875	7,600	10,666
Voronezh	-4,814	-9,006	-7,408	-440	5,416	8,507	11,983
	IRR	PV @ 15%	Cost				
Ryazan	24%	6,253	-10,869				
Saratov	30%	18,337	-15,775				
Volgograd	33%	21,728	-14,681				
Voronezh	28%	20,545	-21,668				
Cash Flow, Cathodic Protection, SCADA, Test Eqt, Netwk Analysis, Pipe Replacement, Environmental							
Ryazan	-1,175	-2,531	-4,125	-3,700	5,600	5,606	5,606
Saratov	-1,449	-3,738	-8,917	-6,103	5,993	6,003	6,003
Volgograd	-1,858	-4,429	-8,259	-7,947	14,628	14,646	14,646
Voronezh	-2,016	-5,522	-10,080	-6,196	11,315	11,324	11,324
	IRR	PV @ 15%	Cost				
Ryazan	34%	12,093	-11,531				
Saratov	23%	8,041	-20,207				
Volgograd	43%	36,861	-22,494				
Voronezh	33%	24,127	-23,814				

* All cash flows constant from 2000 to 2015. Numbers rounded in printing from spreadsheet.

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Appendix 5-A

PROJECT PROFILES - City of Ryazan

PROJECT PROFILE:

Project:	Burner replacement
Location:	RYAZAN
Implementation entity:	Municipal District Heating Company

Description:

Replace old burners with new high efficient burners with associated controls. The total boiler capacity is 150 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	16,000,000	24,000	40,000
Materials		1,400,000	1,400,000
Total US $ equivalent	16,000	1,424,000	1,440,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	15.9 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None

Benefit (Cost of gas saved):

$$15{,}900\ (1000)m^3/yr \times \$40/(1000)m^3 = 636{,}000\ /\ year$$

Could begin:	Jan 1995
Duration of project (from decision to completion):	14 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

Appendix 5-A

(Continued)

PROJECT PROFILE:

Project:	Portable set of instrumentation
Location:	RYAZAN
Implementation entity:	Municipal District Heating Company

Description:

Implement four portable sets of control instrumentation for diagnostics, leaks localization and control.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	20,000,000	8,000	40,000
Materials		772,000	772,000
Total US $ equivalent	20,000	780,000	800,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	11.2 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None

Benefit (Cost of gas saved):

$$11{,}200\ (1000)m^3/yr \times \$40/(1000)m^3 = 448{,}000\ /\ year$$

Could begin:	Jan 1995
Duration of project (from decision to completion):	14 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-A

(Continued)

PROJECT PROFILE:

Project:	Automated controls
Location:	RYAZAN
Implementation entity:	Municipal District Heating Company

Description:

Install automated controls at municipal boiler plants

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	12,000,000	8,000	20,000
Materials		400,000	400,000
Total US $ equivalent	12,000	408,000	420,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	4.76 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
4,760 (1000)m^3/yr x $40/(1000)$m^3$ =	190,400 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	14 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-A

(Continued)

PROJECT PROFILE:

Project:	BTU meters and controls
Location:	RYAZAN
Implementation entity:	Municipal District Heating Company

Description:

Install BTU meters and controls in the buildings served by the boiler plants.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	16,000,000	24,000	40,000
Materials		1,400,000	1,400,000
Total US $ equivalent	16,000	1,424,000	1,440,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	3.9 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
3,900 (1000)m^3/yr x $40/(1000)$m^3$ =	156,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	14 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

PROJECT PROFILE:

Project:	BTU meters and controls
Location:	RYAZAN
Implementation entity:	Ryazanenergo

Description:

Install BTU meters and controls in 1000 residential and commercial buildings served by Ryazanenergo cogeneration plants

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	24,000,000	26,000	50,000
Materials		5,000,000	5,000,000
Total US $ equivalent	24,000	5,026,000	5,050,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	26.9 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
26,900 (1000)m^3/yr x $40/(1000)$m^3$ =	1,076,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	24 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

PROJECT PROFILE:

Project:	Automated controls
Location:	RYAZAN
Implementation entity:	Novoryazanskaya TETS

Description:

Install automated controls on 2 existing HW boilers with the total capacity of 360 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	8,000,000	32,000	40,000
Materials		80,000	80,000
Total US $ equivalent	8,000	112,000	120,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	1.12 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
1,120 (1000)m^3/yr x $40/(1000)$m^3$ =	44,800 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	10 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-A

(Continued)

PROJECT PROFILE:

Project:	Portable control instrumentation
Location:	RYAZAN
Implementation entity:	Novoryazanskaya TETS

Description:

Implement a portable set of test equipment to analyze boiler/flue gas process and emissions.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	4,000,000	16,000	20,000
Materials		80,000	80,000
Total US $ equivalent	4,000	96,000	100,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	1.66 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None

Benefit (Cost of gas saved):

$$1{,}660\ (1000)m^3/yr \times \$40/(1000)m^3 = 66{,}400\ /\ year$$

Could begin:	Jan 1995
Duration of project (from decision to completion):	8 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-A

(Continued)

PROJECT PROFILE:

Project:	Air infiltration reduction at boilers
Location:	RYAZAN
Implementation entity:	Novoryazanskaya TETS

Description:

Install new boiler tube seals to seal out the false air introduced to the flue gas.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	24,000,000	32,000	56,000
Materials		64,000	64,000
Total US $ equivalent	24,000	96,000	120,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	1.12 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None

Benefit (Cost of gas saved):

$$1{,}120\ (1000)m^3/yr \times \$40/(1000)m^3 = 44{,}800\ /\ year$$

Could begin:	Jan 1995
Duration of project (from decision to completion):	8 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-A

(Continued)

PROJECT PROFILE:

Project:	Economizer installation
Location:	RYAZAN
Implementation entity:	Dyagilevskaya TETS

Description:

Install economizer to utilize flue gas heat for pre-heating water at open type design heating system (one boiler).

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	12,000,000	32,000	44,000
Materials		350,000	350,000
Total US $ equivalent	12,000	382,000	394,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	2.25 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
2,250 (1000)m^3/yr x $40/(1000)$m^3$ =	90,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	14 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

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Appendix 5-A

(Continued)

PROJECT PROFILE:

Project:	Air infiltration reduction at boilers
Location:	RYAZAN
Implementation entity:	Dyagilevskaya TETS

Description:

Reduce air infiltration in the boiler system by approximately 30%.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	18,000,000	21,000	39,000
Materials		24,000	24,000
Total US $ equivalent	18,000	45,000	63,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	0.65 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
650 (1000)m^3/yr x $40/(1000)$m^3$ =	26,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	8 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce Pollution
Depends on other projects?	No

Appendix 5-B

PROJECT PROFILES - City of Saratov

PROJECT PROFILE:

Project:	Controls installation
Location:	SARATOV
Implementation entity:	Municipal DH Company

Description:

Install new controls at existing substations.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	33,000,000	24,000	57,000
Materials		495,000	495,000
Total US $ equivalent	33,000	1,227,000	552,000

Change in O&M Costs (+/-)	None
Change in gas usage:	1.15 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
1,150 (1000)m^3 /yr x $40/(1000) m^3 =	46,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	24 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

Appendix 5-B

(Continued)

PROJECT PROFILE

Project:	Boiler replacement
Location:	SARATOV
Implementation entity:	Municipal DH Company

Description:

Replace old inefficient boilers with new boilers equipped with controls. The total boiler capacity is 45 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	45,000,000	48,000	93, 000
Materials		2,500,000	2,500,000
Total US $ equivalent	45,000	2,548,000	2,593,000

Change in O&M Costs (+/-)	None
Change in gas usage:	3.9 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
3,900 (1000)m^3 /yr x $40/(1000) m^3 =	156,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	36 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

Appendix 5-B

(Continued)

PROJECT PROFILE:

Project:	Burner replacement
Location:	SARATOV
Implementation entity:	Municipal DH Company

Description:

Replace old burners with new high efficient with associated controls. The total boiler capacity is 45 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	4,000,000	16,000	20,000
Materials		400,000	400,000
Total US $ equivalent	4,000	416,000	420,000

Change in O&M Costs (+/-)	None
Change in gas usage:	3.1 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
3,100 (1000)m^3 /yr x $40/(1000) m^3 =	124,200 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	18 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

Appendix 5-B

(Continued)

PROJECT PROFILE:

Project:	Portable set of express control instrumentation
Location:	SARATOV
Implementation entity:	Municipal DH Company

Description:

Implement a poratble set of instrumentation for leaks localizations, diagnostics and monitoring.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	20,000,000	15,000	35,000
Materials		190,000	190,000
Total US $ equivalent	20,000	205,000	225,000

Change in O&M Costs (+/-)	None
Change in gas usage:	2.85 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
2,850 (1000)m^3 /yr x $40/(1000) m^3 =	114,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	18 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-B

(Continued)

PROJECT PROFILE:

Project:	BTU meters and controls
Location:	SARATOV
Implementation entity:	Municipal DH Company & DH Boilers

Description:

Install BTU meters and controls in 280 buildings served by DH boilers and Municipal DH Company.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	24,000,000	16,000	40,000
Materials		1,400,000	1,400,000
Total US $ equivalent	24,000	1,400,000	1,440,000

Change in O&M Costs (+/-)	None
Change in gas usage:	5.16 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
5,160 (1000)m^3 /yr x $40/(1000) m^3 =	206,400 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	18 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-B

(Continued)

PROJECT PROFILE:

Project:	Condensing economizer installation
Location:	SARATOV
Implementation entity:	TETS 5

Description:

Install condensing economizer at the entrance to the stack for recovery of heat.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	12,000,000	24,000	36,000
Materials		1,464,000	1,464,000
Total US $ equivalent	12,000	1,488,000	1,500,000

Change in O&M Costs (+/-)	None
Change in gas usage:	6.3 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
6,300 (1000)m^3 /yr x $40/(1000) m^3 =	252,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	16 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other benefits?	No

Appendix 5-B

(Continued)

PROJECT PROFILE:

Project:	Variable speed drives
Location:	SARATOV
Implementation entity:	TETS 5

Description:

Install variable speed drives on for of the boiler feed water and four of the district heating pumps.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	36,000,000	48,000	84,000
Materials		1,600,000	1,600,000
Total US $ equivalent	36,000	1,648,000	1,684,000

Change in O&M Costs (+/-)	None
Change in gas usage:	4.0 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
4,000 (1000)m^3 /yr x $40/(1000) m^3 =	160,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	12 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other benefits?	No

Appendix 5-B

(Continued)

PROJECT PROFILE:

Project:	Reduce air infiltration
Location:	SARATOV
Implementation entity:	TETS 5

Description:

Seal boiler tubes to reduce air infiltration by approximately 25%.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	18,000,000	16,000	34,000
Materials		56,000	56,000
Total US $ equivalent	18,000	72,000	90,000

Change in O&M Costs (+/-)	None
Change in gas usage:	0.75 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
750 (1000)m^3 /yr x $40/(1000) m^3 =	30,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	16 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other benefits?	No

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Appendix 5-B

(Continued)

PROJECT PROFILE:

Project:	BTU meters and controls
Location:	SARATOV
Implementation entity:	Saratovenergo

Description:

Install BTU meters and controls in 1,700 buildings served by Saratovenergo cogeneration plants.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	34,000,000	16,000	50,000
Materials		8,500,000	8,500,000
Total US $ equivalent	34,000	8,516,000	8,550,000

Change in O&M Costs (+/-)	None
Change in gas usage:	48,180 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
48,180 (1000)m^3 /yr x $40/(1000) m^3 =	1,927,200 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	24 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-C

PROJECT PROFILES - City of Volgograd

PROJECT PROFILE:

Project:	Burner replacement
Location:	VOLGOGRAD
Implementation entity:	Volgogradenergo DH System

Description:

Replace old burners with new high efficient burners with associated controls. The total boiler capacity is 125 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	14,500,000	32,000	46,500
Materials		1,532,000	1,530,000
Total US $ equivalent	14,500	1,532,000	1,576,500

Change in O&M Costs (+/-)	None
Change in gas usage:	14.1 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
14,100 (1000)m^3 /yr x $40/(1000) m^3 =	564,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	14 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	Piping replacement
Location:	VOLGOGRAD
Implementation entity:	Volgogradenergo DH System

Description:

Replace sections of piping with new pre-insulated pipes in 3.2 km of trench.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	12,000,000	30,000	42,000
Materials		2,350,000	2,350,000
Total US $ equivalent	12,000	2,380,000	2,392,000

Change in O&M Costs (+/-)	None
Change in gas usage:	4.347 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
4,347 (1000)m^3 /yr x $40/(1000) m^3 =	173,880 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	18 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	Portable set of instrumentation
Location:	VOLGOGRAD
Implementation entity:	Volgogradenergo DH System

Description:

Implement a portable set of control instrumentation for diagnostics, leaks localization and control.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	8,000,000	16,000	24,000
Materials		200,000	200,000
Total US $ equivalent	8,000	216,000	224,000

Change in O&M Costs (+/-)	None
Change in gas usage:	8.05 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
8,050 (1000)m^3 /yr x $40/(1000) m^3 =	322,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	14 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	Boiler replacement
Location:	VOLGOGRAD
Implementation entity:	Municipal DH System

Description:

Install 170 new boilers with associated controls covering the peak load of 150 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	350,000,000	420,000	770,000
Materials		8,100,000	8,100,000
Total US $ equivalent	350,000	8,520,000	8,870,000

Change in O&M Costs (+/-)	None
Change in gas usage:	34.7 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
34,700 (1000)m^3 /yr x $40/(1000) m^3 =	1,388,000/year
Could begin:	Jan-95
Duration of project (from decision to completion):	60 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	Burner replacement
Location:	VOLGOGRAD
Implementation entity:	Municipal DH System

Description:

Replace old burners with new burners with controls. The total boiler capacity is 108 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	18,000,000	42,000	50,000
Materials		1,350,000	1,350,000
Total US $ equivalent	8,000	1,392,000	1,400,000

Change in O&M Costs (+/-)	None
Change in gas usage:	21.9 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
21,900 (1000)m^3 /yr x $40/(1000) m^3 =	876,880 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	24 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	Portable set of instrumentation
Location:	VOLGOGRAD
Implementation entity:	Municipal DH System

Description:

Implement four portable sets of control instrumentation for diagnostics, leaks localization and control.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	38,400,000	64,000	102,400
Materials		800,000	800,000
Total US $ equivalent	38,400	864,000	902,400

Change in O&M Costs (+/-)	None
Change in gas usage:	23,143 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
23,143 (1000)m^3 /yr x $40/(1000) m^3 =	925,720 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	16 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

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Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	Boiler installation
Location:	VOLGOGRAD
Implementation entity:	Voroshilovsky DH Company

Description:

Replacement of 16 boilers with new high efficient boilers with associated controls. covering the peak load of 29,5 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	70,000,000	113,000	183,000
Materials		1,700,000	1,700,000
Total US $ equivalent	70,000	1,813,000	1,883,000

Change in O&M Costs (+/-)	None
Change in gas usage:	2.82 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
2,820 (1000)m^3 /yr x $40/(1000) m^3 =	112,800/year
Could begin:	Jan-95
Duration of project (from decision to completion):	60 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

PROJECT PROFILE:

Project:	Burner replacement
Location:	VOLGOGRAD
Implementation entity:	Voroshilovsky DH Company

Description:

Replace old burners with new burners with controls. The total boiler capacity is 59 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	5,500,000	10,000	15,500
Materials		580,000	580,000
Total US $ equivalent	5,500	590,000	595,500

Change in O&M Costs (+/-)	None
Change in gas usage:	4.2 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
4,200 (1000)m^3 /yr x $40/(1000) m^3 =	168,000 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	12 months
Duration of benefit:	20 years
Other benefits (describe):	Reduced pollution
Depends on other projects?	No

PROJECT PROFILE:

Project:	Portable set of instrumentation
Location:	VOLGOGRAD
Implementation entity:	Voroshilovsky DH Company

Description:

Implement four portable sets of control instrumentation for diagnostics, leaks localization and control.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	2,000,000	8,000	10,000
Materials		80,000	80,000
Total US $ equivalent	2,000	88,000	90,000

Change in O&M Costs (+/-)	None
Change in gas usage:	1,864 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
1,864 (1000)m^3 /yr x $40/(1000) m^3 =	74,560 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	10 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	Piping replacement
Location:	VOLGOGRAD
Implementation entity:	Voroshilovsky DH Company

Description:

Replace sections of piping with new pre-insulated pipes in 2.1 km of trench and insulation in 2 km of trench..

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	16,000,000	20,000	36,000
Materials		1,540,000	1,540,000
Total US $ equivalent	16,000	1,560,000	1,576,000

Change in O&M Costs (+/-)	None
Change in gas usage:	1.163 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
1,163 (1000)m^3 /yr x $40/(1000) m^3 =	46,520 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	12 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-C

(Continued)

PROJECT PROFILE:

Project:	BTU meters
Location:	VOLGOGRAD
Implementation entity:	Voroshilovsky DH Company

Description:

Install BTU meters and control system to maintain domestic hot water temperature in 30 buildings.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	2,000,000	8,000	10,000
Materials		225,000	225,000
Total US $ equivalent	2,000	233,000	235,000

Change in O&M Costs (+/-)	None
Change in gas usage:	746 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
746 (1000)m^3 /yr x $40/(1000) m^3 =	29,840 / year
Could begin:	Jan-95
Duration of project (from decision to completion):	12 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-D

PROJECT PROFILES - City of Voronezh

PROJECT PROFILE:

Project:	Air infiltration reduction at boilers
Location:	VORONEZH
Implementation entity:	TETS-1

Description:

Reduce air infiltration in the boiler system by approximately 30%.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	24,000,000	32,000	56,000
Materials		64,000	64,000
Total US $ equivalent	24,000	96,000	120,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	1.35 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
1,350 (1000)m^3/yr x $40/(1000)$m^3$ =	54,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	12 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	Automated controls
Location:	VORONEZH
Implementation entity:	TETS-1

Description:

Install automated controls on 3 existing boilers with the total capacity of 346 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	10,000,000	40,000	50,000
Materials		120,000	120,000
Total US $ equivalent	10,000	160,000	170,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	2.04 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
2,040 (1000)m^3/yr x $40/(1000)$m^3$ =	81,600 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	10 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	Variable speed motor controls
Location:	VORONEZH
Implementation entity:	TETS-1

Description:

Install variable speed motor controls on the distribution pumps.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	6,000,000	16.000	22,000
Materials		2,340,000	2,340,000
Total US $ equivalent	6,000	2,356,000	2,362,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	3.16 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
3,160 (1000)m^3/yr x $40/(1000)$m^3$ =	126,400 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	8 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	Superheater tube replacement
Location:	VORONEZH
Implementation entity:	TETS-2

Description:

Replace tubes in superheaters on 2 of 3 steam boilers.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	15,000,000	32,000	47,000
Materials		60,000	60,000
Total US $ equivalent	15,000	92,000	107,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	0.32 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
320 (1000)m^3/yr x $40/(1000)$m^3$ =	12,800 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	12 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	Air infiltration reduction at boilers
Location:	VORONEZH
Implementation entity:	TETS-2

Description:

Reduce air infiltration in the boiler system by approximately 30%.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	18,000,000	21,000	39,000
Materials		24,000	24,000
Total US $ equivalent	18,000	45,000	63,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	0.6 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
600 (1000)m^3/yr x $40/(1000)$m^3$ =	24,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	10 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	Automated controls
Location:	VORONEZH
Implementation entity:	TETS-2

Description:

Install automated controls on 2 hot water boilers.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	2,000,000	16,000	18,000
Materials		66,000	66,000
Total US $ equivalent	2,000	82,000	84,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	0.55 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
550 (1000)m^3/yr x $40/(1000)$m^3$ =	22,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	7 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	BTU meters and controls
Location:	VORONEZH
Implementation entity:	Voronezhenergo

Description:

Install BTU meters and controls in 1,300 residential and commercial buildings to control supply/return water temperature.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	32,000,000	64,000	96,000
Materials		6,454,000	6,454,000
Total US $ equivalent	32,000	6,518,000	6,550,000

Change in O&M Costs (+/-)	None
Changes in gas usage:	27.5 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
27,500 (1000)m^3/yr x $40/(1000)$m^3$ =	1,100,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	18 months
Duration of benefit:	20 years
Other benefits (describe):	None
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	Burner replacement
Location:	VORONEZH
Implementation entity:	Municipal District Heating Company

Description:

Replace old burners with new high efficient burners with associated controls. The total capacity of the boilers in 175 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	92,500,000	64,000	156,500
Materials		1,625,000	1,625,000
Total US $ equivalent	92,500	1,689,000	1,781,500

Change in O&M Costs (+/-)	None
Changes in gas usage:	8.8 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
8,800 (1000)m^3/yr x $40/(1000)$m^3$ =	352,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	18 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

Appendix 5-D

(Continued)

PROJECT PROFILE:

Project:	Automated controls
Location:	VORONEZH
Implementation entity:	Municipal District Heating Company

Description:

Install automated controls on 25 existing boilers with the total capacity of 150 Gcal/hr.

Costs	Local (Ru, mid 1993)	Foreign (US$ 1993)	Total (US$ 1993)
Labor	9,400,000	24,000	33,400
Materials		275,000	275,000
Total US $ equivalent	16,000	299,000	308,400

Change in O&M Costs (+/-)	None
Changes in gas usage:	4.0 million m^3
Change in other fuel usage:	None
Other input/output changes (value):	None
Benefit (Cost of gas saved):	
4,000 (1000)m^3/yr x $40/(1000)$m^3$ =	160,000 / year
Could begin:	Jan 1995
Duration of project (from decision to completion):	10 months
Duration of benefit:	20 years
Other benefits (describe):	Reduce pollution
Depends on other projects?	No

SECTION 6 APPENDICES

6-A Industrial Energy Conservation Projects - City of Ryazan

6-B Industrial Energy Conservation Projects - City of Saratov

6-C Industrial Energy Conservation Projects - City of Volgograd

6-D Industrial Energy Conservation Projects - City of Voronezh

RYAZAN ELECKTRONPRIBOR CORPORATION

SUMMARY

Electktronpribor Corporation primarily manufactures electronic devices, modulator and generator bulbs (for welding purposes) and many kinds of lighting bulbs including halogen bulbs. The near future plan includes manufacturing of compact fluorescent lighting. The raw material purchased are metals including precious metals and glass components. There are 9,000 employees. There are 1, 2, and 3 operating shifts. The total energy consumption of natural gas for the year 1992 is 33,269,000 m^3/yr

It is recommended to install 1 new hot water boiler to replace the 1963 steam boiler. The other oldest boiler (3.9 Gcal/hr.), can be converted from steam to hot water and have an automatic burner installed. Not only will the new boilers be more efficient, but the shell losses from the steam to hot water heat exchangers will be eliminated. Having 2 different sizes will allow efficient load following. Since hot water is a closed system, there will be less makeup water and less boiler blowdown.

It is recommended to install a heat exchanger to preheat the makeup water with the hot boiler blowdown.

It is recommended to install automatic controls for the two glass furnaces. It is also recommended to install a refractory lined stack with heat recovery equipment located behind the stack. There are 10 ovens, of which 3 operate around the clock. The rest only operate 8 hrs./day so they will not be retrofitted for now. The estimated cost and resulting savings are presented in the project profile sheets.

PROJECT PROFILE

Project: Convert boiler, replace burner
Location: RYAZAN
Implementing entity: Ryazan Electronpribor Corp.

Description: Install a new gas fired burner with automatic controls and convert the boiler from steam to hot water.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	6,000,000	7,000	13,000
Materials		18,000	18,000
Total (US$)	6,000	19,000	31,000

Change in O&M Costs (+/-)		NONE
Change in gas usage	Reduced by:	0.285 million m^3
Change in other fuel usage		NONE
Other input/output changes (value)		NONE

Benefits = Cost of gas saved 285 (1000) m^3/yr· x $40/(1000) m^3 = $11,400/yr.

Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	11 months
Duration of benefit	20 yr
Other benefits	Reduced pollution
Depends on other projects?	NO

PROJECT PROFILE

Project: Boiler blowdown heat recovery
Location: RYAZAN
Implementing entity: Ryazan Electronpribor Corp.

Description: Install a heat exchanger which will recover the heat from the boiler blowdow each shift and transfer it to the make-up water.

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	1,000,000	1,000	2,000
Materials		6,000	6,000
Total (US$)	1,000	7,000	8,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 0.26 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	260 (1000) m^3/yr· x $40/(1000) m^3 = $10,400/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	3 months
Duration of benefit	20 yr
Other benefits (describe)	Reduced heat pollution
Depends on other projects?	NO

RYAZAN ZIL AUTOMOBILE COMPONENT PLANT

SUMMARY

Zil Automobile Component Plant manufactures front and rear axles, crankshafts, beams and frames, plastic molding and cold stampings of automobile and truck parts. They produce ten different models of front and rear ends at a rate of 70,000 axles per year. The axles are manufactured by hot forging processes which consume a large amount of gas. The hot forging process (front and rear axles, crankshafts, beams and frames) require high temperatures. The hot oven furnaces are gas-fired and the percentage of energy cost in the final product is 42%. Central heating from another building is piped into the plant. No boilers are located at this factory.

It is recommended to install heat recovery equipment to lower the exhaust temperature while preheating the combustion air. A chemical analysis of the flue gas will be necessary in order to determine the acid dew point. Assuming it is below 200°C, it will be necessary to install high temperature, refractory lined stacks with heat recovery located behind the refractory. Standard heat recovery equipment would have trouble at the extremely high temperature of 1000°C. It is also assumed that the 6 projects can be combined into 5 stacks. It is expected to bring the efficiency ratings of the ovens up to 30%. The cost and estimated gas savings are shown in the Project Profile.

PROJECT PROFILE

Project: Install heat recovery
Location: RYAZAN
Implementing entity: Ryazan Zil Automobile Component Plant

Description: Install heat recovery behind the refractory lining of the stack

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	25,000,000	100,000	125,000
Materials		1,550,000	1,550,000
Total (US$)	25,000	1,650,000	1,675,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 4.17 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	4,170 (1000) m^3/yr· x $40/(1000) m^3 = $166,800/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	16 months
Duration of benefit	20 yr
Other benefits (describe)	Reduce Pollution
Depends on other projects?	NO

RYAZAN CHEMICAL FIBERS

SUMMARY

There are a total of twenty-nine separate shops in this chemical plant: Six major process technology shops and twenty-three auxiliary shops for the manufacture of the fiber. The description of the shops are as follows:

- Two chemical shops (the production of cellulose in the form of CS_2 & Na_2SO_4 to obtain the fiber)
- Two fiber mass production shops (cellulose being introduced into the sedimentation solution. This process solution forms a viscous fiber which are forced into extruders (28,000 -openings), then cut into 70 mm sections, dumped into bundles and processed in bails and then shipped to customers)
- Two process solution shops (to prepare process solutions of H_2SO_4 & Na_2SO_4 and Zn_2SO_4 is the sedimentation of process solution).

After review of the current process, we have no short-term recommendations for gas conservation measures. The company is considering replacing the existing evaporators with multi-case vacuum evaporators in the next three years.

RYAZAN COLOR METAL MANUFACTURING AND REPROCESSING PLANT

SUMMARY

There are 5 major shops in the plant. The first is a melting shop which performs the primary step in the alloy processing. Then there is the metal processing shop. The third shop is the hydro-metallurgical shop which produces tin and lead alloys from its ores. The cleaning shop, which receives products from the melting shop, performs a rough cleaning of the alloy. The fifth major shop contains the cold rolling process.

The factory has heat recovery equipment in place. The melting furnace needs controls which would result in fuel savings. By more accurately maintaining the proper temperatures, the quality of the product will improve. The melting furnace is the most important process at the factory. It is estimated that 2% of the plants' fuel consumption can be reduced. The estimated cost and resultant gas savings are shown in the following project profile.

PROJECT PROFILE

Project: Install automatic controls
Location: RYAZAN
Implementing entity: Ryazan Color Metal Manufacturing And Reprocessing Plant

Description: Install automatic controls on melting furnace.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	6,000,000	20,000	26,000
Materials		100,000	100,000
Total (US$)	6,000	120,000	126,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 0.600 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	600 (1000) m^3/yr· x $40/(1000) m^3 = $24,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	11 months
Duration of benefit	20 yr
Other benefits	Reduced pollution
Depends on other projects?	NO

RYAZAN METAL FORGING/PRESS PLANT

SUMMARY

The facility is privatized as a joint stock company with 2,000 employees working 2 and 3 shifts a day. There are 7 shops located in the factory. The following are the two most important; the "Old" Press & Forgings shop and the "New" Press & Forgings shop. The new shop is about 2 years old. The entire facility has an annual average load of 30% of its equipment's' capacity.

It must be noted that if the plant were to go from 30% utilization to 70%, their gas consumption would increase from 13.75 to 32 million m^3. It is recommended to install heat recovery equipment to more fully recover the flue gas heat if the production load is expected to increase. Recovered heat from high temperature furnaces can be utilized by supplemental firing of flue gases in new waste heat recovery (WHR) boilers (low temperature thermal furnaces).

PROJECT PROFILE

Project: Install 4 waste heat recovery boiler with supplemental burners
Location: RYAZAN
Implementing entity: Ryazan Metal Forging/Press Plant

Description: Install 4 new waste heat recovery boilers with auxiliary burners.

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	8,000,000	25,000	33,000
Materials	———	600,000	600,000
Total (US$)	8,000	625,000	633,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 2.75 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	2,750 (1000) m^3/yr· x $40/(1000) m^3 = $110,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	11 months
Duration of benefit	20 yr
Other benefits	Reduced pollution
Depends on other projects?	NO

RYAZAN TANNERY

SUMMARY

The Tannery plant employs 2000 people. There are some departments which operate 3 shifts per day. The plant does not make consumer goods, they process bull and cows' skin into sheets of leather. These sheets are available in many colors for sale to other companies who will make consumer goods out of them. The factory was built as a turn-key project by an Italian firm. The major process equipment is Italian manufactured. There are 7 major shops and 7auxiliary ones in the plant. Some of the auxiliary shops are the boiler house, compressor station, sewage cleaning station and ventilation shop.

Rather than install new, smaller burners to more efficiently meet the reduced demand, it is recommended that the plant find a way to increase its production load. Then the equipment and controls will work properly.

Presently air for the burners is preheated by hot water to 30°C. It is recommended to install a heat exchanger which will preheat the combustion air using the heat from the hot flue gases. It is estimated that the existing hot water preheater , which raises the temperature to 30°C, can be eliminated. This will save 5% of the annual fuel consumption. The estimated gas savings and installation cost are shown in the project profile.

PROJECT PROFILE

Project: Install 4 combustion air preheaters
Location: RYAZAN
Implementing entity: Ryazan Tannery Plant

Description: Install 4 new combustion air preheaters which will preheat the boiler combustion air from the hot flue gases.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	4,000,000	20,000	24,000
Materials		44,000	44,000
Total (US$)	4,000	64,000	68,000

Change in O&M Costs (+/-) NONE

Change in gas usage Reduced by: 0.993 million m^3

Change in other fuel usage NONE

Other input/output changes (value) NONE

Benefits = Cost of gas saved 992.5 (1000) m^3/yr· x $40/(1000) m^3 = $39,700/yr.

Could begin: 1/95 mo./yr

Duration of project (from decision to completion) 8 months

Duration of benefit 20 yr

Other benefits Reduced heat pollution

Depends on other projects? NO

SARATOV RED BRICK FACTORY

SUMMARY

There are two factories which make identical red brick products. Each factory is independent. The major raw material, clay, is heated with steam and mixed with water and pressed into a mold. A cutting machine then slices the material into many bricks. The bricks are then dried using 130°C hot air. After drying for 48 hours, the bricks are moved to the kiln where they are baked for 56 hours at 960°C.

The major gas consuming equipment consists of a steam boiler, 2 hot water boilers, 5 hot air furnaces and a brick kiln. The gas used in the manufacter of the bricks makes up 22% of the cost of the bricks.

Production has remained steady, despite the increase in the cost of materials. A heat recovery wheel should be installed in the exhaust of the brick kiln for a minimum savings as shown below. This unit will not only save gas, it will allow maintenance to be performed on any of the 5 hot air furnaces without having to stop the production process. There is no recommendation to reduce the energy consumption on the steam boiler. Since it has a constant load, there would not be an appreciable savings seen by installing a modulating gas burner. However, a modulating gas burner and replacement boiler for 2 of the 3 hot water boilers which serve 500 apartments is recommended. The estimated cost and resulting savings are shown in the project profiles.

PROJECT PROFILE

Project: Heat Recovery
Location: SARATOV
Implementing entity: Saratov Red Brick Factory

Description: Install a heat recovery wheel in the exhaust of the brick kiln.

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	6,000,000	20,000	26,000
Materials		200,000	200,000
Total (US$)	6,000	220,000	226,000

Change in O&M Costs (+/-)		NONE
Change in gas usage	Reduced by:	0.763 million m^3
Change in other fuel usage		NONE
Other input/output changes (value)		NONE
Benefits = Cost of gas saved	763 (1000) m^3/yr· x $40/(1000) m^3 = $30,560/yr.	
Could begin:		1/95 mo./yr
Duration of project (from decision to completion)		13 months
Duration of benefit		20 yr
Other benefits		Reduced pollution
Depends on other projects?		NO

PROJECT PROFILE

Project: Boiler replacements
Location: SARATOV
Implementing entity: Saratov Red Brick Factory

Description: Install a modulating gas burner and replacement boiler for 2 of the 3 hot water boilers which serve 500 apartments.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	3,000,000	20,000	23,000
Materials		120,000	120,000
Total (US$)	3,000	140,000	143,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 1.620 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	1,620 (1000) m^3/yr· x $40/(1000) m^3 = $64,800/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	13 months
Duration of benefit	20 yr
Other benefits (describe)	Reduced pollution
Depends on other projects?	NO

SARATOV REINFORCED CONCRETE FACTORY -

SUMMARY

The mechanical mixing of cement, sand, water, and gravel produces concrete. When metal rods are placed in the mold then it becomes reinforced concrete. A mold is a large metal base with 4 sides hinged to the base. The rebar is bent to shape by hand and put in the mold after it is greased. The sides are then raised and locked into position. Concrete is poured into the mold. Several molds are in a diked area. Steam heats the concrete to 80-90°C for 8-12 hours. The steam is turned on after the lid is placed over the mold.

It is proposed that all steam concrete dryers should be converted to a gas fired hot air drying system It is estimated that this measure will reduce the gas consumption from 70 m^3 to 12 m^3 of gas for every cubic meter of concrete manufactured. At an annual production rate of 100,000 m^3, 5 million m^3 of gas will be saved each year. This represents a 28% savings over the gas consumed by the present drying system. The estimated cost and resulting savings are shown in the project profiles.

PROJECT PROFILE

Project: Boiler replacements
Location: SARATOV
Implementing entity: Saratov Reinforced Concrete Factory

Description: Convert all of the steam concrete dryers to a gas fired hot air drying system.

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	5,000,000	20,000	25,000
Materials	———	325,000	325,000
Total (US$)	5,000	345,000	350,000

Change in O&M Costs (+/-) Reduce 90% of current makeup water to the boilers along with the necessary chemical treatment of that water.

Change in gas usage Reduced by: 9.30 million m^3

Change in other fuel usage NONE

Other input/output changes (value) NONE

Benefits = Cost of gas saved 9,300 (1000) m^3/yr· x $40/(1000) m^3 = $372,000/yr.

Could begin: 1/94 mo./yr

Duration of project (from decision to completion) 3 months

Duration of benefit 20 yr

Other benefits (describe) Reduced boiler pollution
Depends on other projects? NO

SARATOV RUBBER PRODUCTS FACILITY

SUMMARY

The main products, which constitute 70% of the production, are battery cases for both cars and motorcycles. The scrap rubber from this process is used to make plastic lawn chairs, pails, shopping bags, pipe for farm irrigation and garden hoses. Production is presently at about 3 million battery cases, 600,000 m^2 plastic sheets, 12 million plastic bags, 150 tons of hoses, 250 km of plastic pipes, 35,000 buckets, 20,000 sets of washers and 400 ton of industrial sponge each year. Raw materials, including 370 tons of ebonite, are mechanically mixed to form globs of rubber. These globs are then passed through a roller press where the rubber comes out in sheet form. The sheets are rolled up and cut to different sizes, depending on which product it is to become. The rolls of rubber are then transferred to another building where the hydraulic presses are located. A piece of rubber is manually placed on top of the mold. A button is pressed and the outside shell of the mold is lowered using 250 atmospheres of force (6,000 #). A valve is opened and 140°C steam enters inside the mold. This heat makes the rubber distribute evenly. After 2 minutes, the item is removed, and excess rubber is pulled off by hand and the item is allowed to cool for 10 minutes with metal inserts installed inside the empty mold to help it keep its shape.

Each of the 4 boilers are rated for 18 tons/hour of steam at a pressure of 23 atm, but they are operated at 8 atm. On low fire the boiler makes 10-12 tons/hr of steam. One of the two boilers in each boiler room is dual fuel fired.

It is estimated that 25-30% of their annual fuel usage (19.5 x 25-30% = 4.9 - 5.9 million m^3/yr) would be reduced if a 90% efficient 5-8 ton/hour boiler were installed in each of the two boiler rooms. This would allow operation during the summer at full fire and improved tracking of the load during mild winter days. The other proposed measure is to install a condensate receiver in each vulcanization shop. Returning hot condensate to the boilers will save 5-10% of the annual gas usage. A costs and gas savings are summarized in the project profiles.

PROJECT PROFILE

Project: Condensate recovery system
Location: SARATOV
Implementing entity: Saratov Rubber Products Facility

Description: Install a condensate receiver in each vulcanization shop.

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	1,000,000	2,000	3,000
Materials		18,000	18,000
Total (US$)	1,000	38,000	21,000

Change in O&M Costs (+/-) Reduce 90% of current makeup water to the boilers along with the necessary chemical treatment of that water.

Change in gas usage Reduced by: 1.472 million m^3

Change in other fuel usage NONE

Other input/output changes (value) NONE

Benefits = Cost of gas saved 1,472 (1000) m^3/yr· x $40/(1000) m^3 = $58,880/yr.

Could begin: 1/95 mo./yr

Duration of project (from decision to completion) 2 months

Duration of benefit 20 yr

Other benefits (describe) Reduced boiler pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Install Boilers
Location: SARATOV
Implementing entity: Saratov Rubber Products Facility

Description: Install a 90% efficient 5-8 ton/hour boiler in each of the two boiler rooms.

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	5,000,000	20,000	25,000
Materials		325,000	325,000
Total (US$)	5,000	345,000	350,000

Change in O&M Costs (+/-) NONE

Change in gas usage Reduced by: 5.40 million m^3

Change in other fuel usage NONE

Other input/output changes (value) NONE

Benefits = Cost of gas saved 5,400 (1000) m^3/yr· x $40/(1000) m^3 = $216,000/yr.

Could begin: 1/95 mo./yr

Duration of project (from decision to completion) 14 months

Duration of benefit 20 yr

Other benefits (describe) Reduced boiler pollution

Depends on other projects? NO

SARATOV RUBBER PRODUCTS FACILITY

SUMMARY

The main products, which constitute 70% of the production, are battery cases for both cars and motorcycles. The scrap rubber from this process is used to make plastic lawn chairs, pails, shopping bags, pipe for farm irrigation and garden hoses. Production is presently at about 3 million battery cases, 600,000 m^2 plastic sheets, 12 million plastic bags, 150 tons of hoses, 250 km of plastic pipes, 35,000 buckets, 20,000 sets of washers and 400 ton of industrial sponge each year. Raw materials, including 370 tons of ebonite, are mechanically mixed to form globs of rubber. These globs are then passed through a roller press where the rubber comes out in sheet form. The sheets are rolled up and cut to different sizes, depending on which product it is to become. The rolls of rubber are then transferred to another building where the hydraulic presses are located. A piece of rubber is manually placed on top of the mold. A button is pressed and the outside shell of the mold is lowered using 250 atmospheres of force (6,000 #). A valve is opened and 140°C steam enters inside the mold. This heat makes the rubber distribute evenly. After 2 minutes, the item is removed, and excess rubber is pulled off by hand and the item is allowed to cool for 10 minutes with metal inserts installed inside the empty mold to help it keep its shape.

Each of the 4 boilers are rated for 18 tons/hour of steam at a pressure of 23 atm, but they are operated at 8 atm. On low fire the boiler makes 10-12 tons/hr of steam. One of the two boilers in each boiler room is dual fuel fired.

It is estimated that 25-30% of their annual fuel usage (19.5 x 25-30% = 4.9 - 5.9 million m^3/yr) would be reduced if a 90% efficient 5-8 ton/hour boiler were installed in each of the two boiler rooms. This would allow operation during the summer at full fire and improved tracking of the load during mild winter days. The other proposed measure is to install a condensate receiver in each vulcanization shop. Returning hot condensate to the boilers will save 5-10% of the annual gas usage. A costs and gas savings are summarized in the project profiles.

SARATOV ELECTROUNIT PRODUCTION OPERATION (SEPO)

This factory was built in 1940 as an electrical and electronic specialty equipment manufacturer of airplane equipment. They now produce refrigerators, which make up 70% of their production. Other products include arc welders. The factory is privatized and employs 20,000 people, working 6 days a week, 2 or 3 shifts per day. The boiler plant, in addition to generating steam for use within the factory, produces hot water which is pumped to the nearby town. There are 7 boilers installed at the factory. Four are gas fired water wall steam boilers which operate at 4 atmospheres (150°C) and are rated for 15 ton/hr. Two are used year round and 2 are backup. All 4 are as old as the factory, about 50 years. The gas is supplied to the boiler through manually controlled valves. The steam load is not very constant so the boiler operators are making constant adjustments. All boilers have economizers to heat the feedwater. A summary of the costs and savings are shown below.

The largest gas savings can come from replacing one of the 50 year old steam boilers with an equal sized brand new unit. The new boiler must have automatically modulating gas burner controls. The steam pressure will now be able to remain constant, increasing the quality of production and reducing the cost to produce the product. It is estimated that a new steam boiler will increase the steam boiler annual system efficiency from the present 60% to 75%. At a load of 28 million m^3/yr, a 15% savings represents an annual gas savings of 4.2 million m^3/yr. By installing this equipment to reduce gas consumption, the emission output of the factory will also be reduced.

The factory is presently rebuilding one of the 3 hot water boilers. There are no plans to install a new burner with automatically modulating gas controls. It is proposed that the new burner be equipped with controls so the boiler can follow the load closely. A new burner is estimated to increase the boilers' efficiency by 8-10%. This equates to a savings of 1.4 million m^3/yr. By installing this equipment to reduce gas consumption, the emission output will be also reduced. The costs and savings in gas are summarized in the project profiles.

PROJECT PROFILE

Project: Replace steam boiler
Location: SARATOV
Implementing entity: Saratov Electrounit Production Operation (SEPO)

Description: Replace one of the 50 year old steam boilers with an equal sized brand new unit.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	9,000,000	20,000	29,000
Materials		575,000	575,000
Total (US$)	9,000	595,000	604,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	4.20 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	4,200 (1000) m^3/yr· x $40/(1000) m^3 = $168,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	13 months
Duration of benefit	20 yr
Other benefits (describe)	Reduced boiler pollution
Depends on other projects?	NO

PROJECT PROFILE

Project: Replace burner
Location: SARATOV
Implementing entity: Saratov Electrounit Production Operation (SEPO)

Description: Install a new burner on an existing boiler.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	5,000,000	20,000	25,000
Materials	———	375,000	375,000
Total (US$)	5,000	395,000	400,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 1.40 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	1,400 (1000) m^3/yr· x $40/(1000) m^3 = $56,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	12 months
Duration of benefit	20 yr
Other benefits (describe)	Reduced boiler pollution
Depends on other projects?	NO

SARATOV DRY ICE & ICE CREAM FACILITY

SUMMARY

This facility was built in 1973 and is "open" privatized. Anyone can buy stock in the company. They manufacture ice cream and dry ice to keep it cold while being transported and sold. 10 million m^3 of gas is consumed per year. 470 people are employed on 2 shifts making 3,500 tons of ice cream. Presently, 1 ton/day of dry ice is also produced.

One of the smaller boilers should have automatic burner controls installed. This would allow accurate load following. A savings of 10% on the annual fuel bill can be expected. The factory would like to replace 1 obsolete production line. It is recommended to install the process which will recover an additional 67% of CO_2 from the boiler exhaust. This will save 6% of the annual gas consumption. The cost and savings are summarized in the project profiles.

PROJECT PROFILE

Project: Replace CO_2 recovery
Location: SARATOV
Implementing entity: Saratov Dry Ice & Ice Cream Facility

Description: Install the process which will recover an additional 67% of CO_2 from the boiler exhaust.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	1,000,000	20,000	21,000
Materials		25,000	25,000
Total (US$)	1,000	45,000	46,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 0.60 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	600 (1000) m^3/yr· x $40/(1000) m^3 = $24,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	12 months
Duration of benefit	20 yr
Other benefits (describe)	Reduced CO_2 pollution
Depends on other projects?	NO

PROJECT PROFILE

Project: Replace Production line
Location: SARATOV
Implementing entity: Saratov Dry Ice & Ice Cream Facility

Description: Replace 1 obsolete production line.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	8,000,000	20,000	28,000
Materials		680,000	680,000
Total (US$)	8,000	700,000	708,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 0.10 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	100 (1000) m^3/yr· x $40/(1000) m^3 = $4,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	15 months
Duration of benefit	20 yr
Other benefits (describe)	NONE
Depends on other projects?	NO

PROJECT PROFILE

Project: Replace Burner Controls
Location: SARATOV
Implementing entity: Saratov Dry Ice & Ice Cream Facility

Description: Install automatic burner controls on one of the smaller boilers.

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	5,000,000	20,000	25,000
Materials		375,000	375,000
Total (US$)	5,000	395,000	400,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 1.00 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	1,000 (1000) m^3/yr· x $40/(1000) m^3 = $40,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	12 months
Duration of benefit	20 yr
Other benefits (describe)	Reduce Pollution
Depends on other projects?	NO

SARATOV NITRON CHEMICAL FACTORY

SUMMARY

This facility was built in 1953 and uses 80-90 million m^3 of gas per year. The five product lines are as follows:

1. Fibers (Nitron)	60 tons/day
2. Nitrile acrylic acid	25 car train load/day
3. Vinegar-technical	35 tons/day
4. Acetone-nail polish	40,000 tons/year
5. Formic acid	not yet functioning

The factory maintains production 24 hr./day, 7 days a week using 6,000 people.

The recommendation is to install automatic controls on the 6 waste heat recovery boilers. This would reduce the stack temperature from 170°C to 130-140°C. This is estimated to cost $125,000 and save 32 million m^3 of gas per year based on a 24 hr./day operation. The costs and gas savings are shown in the project profiles.

PROJECT PROFILE

Project: Install automatic controls
Location: SARATOV
Implementing entity: Saratov Nitron Chemical Factory

Description: Install automatic controls on the 6 waste heat recovery boilers.

Costs	Local (Ru. mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	2,000,000	2,000	2,000
Materials	———	65,000	65,000
Total (US$)	2,000	67,000	67,000

Change in O&M Costs (+/-) NONE

Change in gas usage Reduced by: 32.00 million m^3

Change in other fuel usage NONE

Other input/output changes (value) NONE

Benefits = Cost of gas saved 32,000 (1000) m^3/yr· x $40/(1000) m^3 = $1,280,000/yr.

Could begin: 1/95 mo./yr

Duration of project (from decision to completion) 16 months

Duration of benefit 20 yr

Other benefits (describe) Reduce Pollution

Depends on other projects? NO

SARATOV GLASS FACTORY

SUMMARY

The factory has six large glass smelters and six small ones. Three of the small smelters are used to produce crystal. The factory produces 5.5 million m^2 of glass per year. The glass is 4-6 mm thick. The width of the glass is 3 m and maximum dimension is 3 x 3.5 m. All smelters fire gas. In the winter they fire 600,000 m^3/day and in the summer 420,000 m^3/day. The factory employs 7,000 people. The annual amount of gas used in 1992 was 195.67 million m^3.

The glass smelters use about 75% of the gas shown above. The peak amount of gas used by the glass factory is 24,000 m^3/hr. and the minimum is 20,000 m^3/hr. The large smelters are firing about 3,500 - 5,000 m^3/hr and the small ones fire 300 - 500 m^3/hr of gas. Over the years they performed some smelter improvements which included a change of design and better insulation. They were able to reduce the original gas consumption by 17 - 20%. Presently the efficiency of the smelters is about 30%.

A more cost effective solution is heat recovery equipment which is installed behind the refractory lining of the stack. The stack would be 90-120 feet high. This height will allow the particles to settle out at the base of the stack. Automatic equipment can be installed which will remove the particles without having to shut down the stack. Their estimate was that from one smelter they can have a heat recovery of 6-7 Gcal/hr. A very rough budget estimate is $490,000 per oven for a gas savings of 6,653,165 m^3/yr. The total for all 6 ovens is shown below. It is not recommended to install this equipment on the small ovens at this time due to the decrease in savings for very little decrease in capital cost. The 3 smaller ovens that are used for crystal manufacturing will have different chemical composition of the exhaust that may raise the cost of the heat recovery equipment. The costs and gas savings are shown in the project profiles.

PROJECT PROFILE

Project: Install heat recovery
Location: SARATOV
Implementing entity: Saratov Glass Factory

Description: Install heat recovery behind the refractory lining of the stack

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	26,000,000	120,000	146,000
Materials		1,860,000	1,860,000
Total (US$)	26,000	1,980,000	2,006,000

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 40.00 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	40,000 (1000) m^3/yr· x $40/(1000) m^3 = $1,600,000/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	16 months
Duration of benefit	20 yr
Other benefits (describe)	Reduce Pollution
Depends on other projects?	NO

SARATOV FOOD FAT-PRODUCTS FACTORY

SUMMARY

The factory makes margarine, mayonnaise, stearine, glycerin, soup, olive oil, fatty acids and dry ice. The plant employs 904 people. Some products are manufactured around the clock and others involve only 1 shift per day. Gas consumption is 2.3% of the product cost. The annual gas consumption for 1992 is 36.324 million m^3

It is recommended to install two new boilers. Both a 10 ton/hr. (6.8 Gcal/hr.) and a 3 ton/hr. (2.04 Gcal/hr.) will provide the range of load following presently lacking. This will provide an updated burner and control system in addition to a backup boiler during the winter. The existing boilers can be used for the base load and the new boilers will track the load. When the larger of the two new boilers reduces to low fire, that could automatically signal the new smaller boiler to turn on and go to high fire. The rest of the boilers will remain on high fire where they can be set to run efficiently. This procedure will minimize the investment required, while giving good payback results. A 12% reduction in gas consumption will result in saving 4,230,000 m^3/yr. The results are shown in the project profile.

PROJECT PROFILE

Project: Install new boilers
Location: SARATOV
Implementing entity: Saratov Food Fat Products Processing Plant

Description: Install two new boilers (10 ton/hr. (6.8 Gcal/hr.) and an 3 ton/hr. (2.04 Gcal/hr.)).

Costs	Local (Ru, mid '93)	Foreign ($US93)	TOTAL (US$)
Labor	6,000,000	20,000	26,000
Materials	———	400,970	400,970
Total (US$)	6,000	420,970	426,970

Change in O&M Costs (+/-)	NONE
Change in gas usage	Reduced by: 4.23 million m^3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE
Benefits = Cost of gas saved	4,230 (1000) m^3/yr x $40/(1000) m^3 = $169,200/yr.
Could begin:	1/95 mo./yr
Duration of project (from decision to completion)	14 months
Duration of benefit	20 yr
Other benefits (describe)	Reduce Pollution
Depends on other projects?	NO

SARATOV CONCRETE FACTORY

SUMMARY

The factory manufactures concrete elements and cuts stone (marble, granite) into pieces for the construction industry. They also manufacture wooden window frames, chair legs, and doors. The factory generates 18,000 Gcal/month of hot water during the winter for the local village. They use 15,000 Gcal/month on concrete products. There are extra steam boilers which generate hot water to heat a local region. In a separate building, hot water is generated by steam in a heat exchanger to serve the military barracks where the military recruits sleep.

The concrete drying ovens would benefit from conversion of the current steam drying system to direct gas fired hot air system, if production picks up again. It may be more economical to have the concrete products built at other, larger factories that have already been privatized. The factory could switch to making more wood products. No measures are recommended for this facility unless production picks up again.

SARATOV WHITE BRICK FACTORY

SUMMARY

The factory uses 30,000 m^3/day of gas in the winter and 17,000 m^3/day of gas in summer, for a total of about 8 million m^3/yr. The factory manufactures about 140,000,000 bricks per year, using 3 shifts/day, 7 days a week. This equals approximately 400,000 bricks per day. The bricks are made from a mixture of lime, hot condensate and silicate. Silicate is the primary material. After they are formed in an automatic process, they are manually transferred to a pallet with steel wheels which run on railroad tracks. These carts are then put into an autoclave which is a large kiln. The oven takes approximately 1 ½ hours to preheat and it heats for 6½ hours at about 180 - 185°C. The autoclave then takes about 1 ½ hours to cool down.

The only way the factory can reduce fuel consumption is to replace some of their older boilers which are 88% efficient with new boilers which will be 90% efficient. That would not be cost effective, so in lieu of that it is recommend that this type of brick be used whenever possible instead of the red bricks because the red bricks consume 5 times more energy to manufacture. If red bricks are being used for the housing industry, possibly more of these white brick factories should be built (addressing the environmental issues) and the red bricks should be utilized on the larger buildings where the white bricks are not appropriate. No gas conservation measures are recommended.

SARATOV ALMAZ ELECTRONICS RESEARCH FACILITY

SUMMARY

The factory manufactures electronics and electrical products. It appears they are not manufacturing much currently. The are into scientific and industrial research. The biggest project they are working on is how to make electronic gas meters and they are doing this in conjunction with GIPRONIIGAS Institute. It is felt by Almaz that by installing meters in each apartment, gas consumption will be reduced. Therefore no gas conservation measures can be offered.

LCD

SARATOV BREAD FACTORY

SUMMARY

This facility was built in 1961 and uses 1.8 million m^3 of gas per year. The plant bakes approximately 70 tons of bread each day. The factory maintains production 24 hr./day, 7 days a week using 250 people. The demand for bread has risen, despite the price increase, because other foods have risen even higher.

The bread factory plans on replacing the ovens due to the quick payback. It would not be cost effective to equip one of the boilers with automatic burner controls. A savings of 10% on the annual fuel bill would result in a 10,000 m^3/year savings. That would not justify an investment of $10,000. There are no recommended changes for this factory.

SARATOV OIL REFINERY

SUMMARY

The plant was built in 1940 for the production of petroleum products. Crude oil is the basic raw material and from that comes

- gasoline
- kerosene
- diesel
- lubricating oil

The factory uses 27 million m^3 of gas each year. 95% of that gas is used in refinery ovens.

A US and 2 Spanish firms have already offered new, high efficiency ovens. But since any new ovens would not allow older ovens to be taken out of service, there is no recommendation for this factory.

Appendix 6C

VOLGOGRAD ALUMINUM PLANT

SUMMARY

The Aluminum Plant was built in 1958, presently employs 3500 people and it is one of the largest enterprises in the city of Volgograd. The plant uses bauxite as a feedstock and produces aluminum powder, bars, round stock and cookware. The annual production is 144,000 tons of final product. Aluminum plant is operating 24 hours per day in four shifts and has orders for its full production capacity through December of 1993. Presently the plant has formed a joint venture with a Greek company to produce aluminum window and door frames from rollstock. The plant process utilizes electricity, gas and steam. The electric base load is 350 MWh which is supplied by the Volgograd hydro electric plant. The total natural gas consumption of the plant for the year 1992 was 36.5 million m^3.

There are three main areas of the gas consumption at the plant: casting shop, boiler room and rotary kilns.

It is recommended to seal eight ovens in the casting shop to reduce infiltration. The infiltration is very significant ant it deteriorates the efficiency of the combustion process. It is also proposed to install up to date burner controls at the ovens what will stabilize the combustion process and improve its efficiency.

The temperature of flue gases in boiler room ranges from 350 to 400°C. It is recommended to install one supplementary fired heat recovery steam generator in the boiler room to generate steam necessary for technological process what will allow to unload presently existing steam generators.

The combustion process in eight existing boilers (installed in 1958 - 1963) is very inefficient due to old burners. It is recommended to replace old burners with new high efficient burners with the automatic controls.

It was also recommended to utilize improved refractory brick for rotary kilns since the refractory brick is replaced every six months.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project:	Burner replacement
Location:	VOLGOGRAD
Implementing entity:	Aluminum Plant

Description:
Installation of new burners on existing boilers with associated controls (total boilers capacity is 13 Gcal/hr).

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	1,400,000	17,000	18,400
Materials		154,000	154,000
Total US $ equivalent	1,400	171,000	172,400

Change in O&M Costs (+/-)	NONE
Change in gas usage	2.0 million m3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE

Benefits (Cost of Gas Saved)

2,000 (1000) m3/yr x $40/(1000) m3 = $80,000 / year

Could begin:	Jan-95
Duration of project (from decision to completion)	7 months
Duration of benefit	20 years
Other benefits (describe)	Reduce pollution
Depends on other projects?	NO

PROJECT PROFILE

Project: Insulation
Location: VOLGOGRAD
Implementing entity: Aluminum Plant

Description:
Install insulation on 8 furnaces at the casting shop.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	1,200,000	8,200	9,400
Materials		41,000	41,000
Total US $ equivalent	1,200	49,200	50,400

Change in O&M Costs (+/-) NONE

Change in gas usage 0.9 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
900 (1000) m3/yr x $40/(1000) m3 = $36,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 8 months

Duration of benefit 20 years

Other benefits (describe) NONE

Depends on other projects? NO

PROJECT PROFILE

Project: Automatic controls
Location: VOLGOGRAD
Implementing entity: Aluminum Plant

Description:
Install automatic controls at furnaces in the casting shop

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	2,400,000	8,200	10,600
Materials		120,000	120,000
Total US $ equivalent	2,400	128,200	130,600

Change in O&M Costs (+/-) NONE

Change in gas usage 1.0 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
1,000 (1000) m3/yr x $40/(1000) m3 = $40,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 9 months

Duration of benefit 20 years

Other benefits (describe) Reduce furnaces pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Heat recovery
Location: VOLGOGRAD
Implementing entity: Aluminum Plant

Description:
Install heat recovery steam generators on 3 existing boilers. Flue gas temperature is about 400°C

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	2,200,000	16,200	18,400
Materials		120,000	120,000
Total US $ equivalent	2,200	136,200	138,400

Change in O&M Costs (+/-) NONE

Change in gas usage 1.7 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
1,700 (1000) m3/yr x $40/(1000) m3 = $68,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 12 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

VOLGOGRAD SILICA BUILDING MATERIALS FACTORY

SUMMARY

The enterprise has begun in 1930 to build tractors in 1930. Later an adjacent factory was installed to produce construction materials. In 1950 the separate factories were combined and converted to the building materials factory. The company now employs 1,130 people and consists of four major groups of shops (four factories) producing 29,000,000 bricks per month. The company also produces wall panels and intends to produce bath and kitchen equipment with the estimated capacity of 3,000 units per year and linoleum in amount of 3,000,000 square meters per month. They plan to build a shop for natural stone surface treatment with the design capacity of 300,000 square meters per month.

The gas used in the of the brick manufacturing makes up 19 to 25% of the cost of the bricks depending on the physical condition of the feedstock. The annual gas consumption is 48.5 million m^3 where approximately 60% goes to limestone production and 40% to the boiler room.

This is a jointstock company which owns all of its equipment and land. They have joint stock certificate No. 1. The firm is economically independent and has access to all materials and equipment necessary to manufacture their product. The enterprise is a monopoly and its percentage of profit is limited by the government of 25 %

It is recommended to replace old inefficient burners on boilers with new high efficient burners with associated controls. The existing burners are very old, without any automatic controls and significantly deteriorate overall boiler efficiency

It is proposed the replacement of old vertical smelters with two horizontal fluidized bed kilns with incorporated controls and heat recovery system.

It is recommended to install condensate cleaning equipment and provide condensate recovery system (non-existent now).

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Burner replacement
Location: VOLGOGRAD
Implementing entity: Silica Building Materials Factory

Description:
Installation of new burners on existing boilers with associated controls (three boilers with a total capacity 25 Gcal/hr).

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	2,500,000	30,000	32,500
Materials		275,000	275,000
Total US $ equivalent	2,500	305,000	307,500

Change in O&M Costs (+/-) NONE

Change in gas usage 3.1 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
3,100 (1000) m3/yr x $40/(1000) m3 = $124,000 / year

Could begin: Oct-94
Duration of project (from decision to completion) 10 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Smelter replacement
Location: VOLGOGRAD
Implementing entity: Silica Building Materials Factory

Description:
It is proposed to replace seven vertical smelters with two horizontal fluidized bed kilns with controls

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	40,000,000	64,000	104,000
Materials	475,000,000		475,000
Total US $ equivalent	515,000	64,000	579,000

Change in O&M Costs (+/-) NONE

Change in gas usage 7.0 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
7,000 (1000) m3/yr x $40/(1000) m3 = $280,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 18 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution, possibility to utilize up to 96% of final product

Depends on other projects? NO

PROJECT PROFILE

Project: Condensate recovery system
Location: VOLGOGRAD
Implementing entity: Silica Building Materials Factory

Description:
Install a condensate receiver with pumps in each autoclave shop, cleaning equipment, steam traps and piping.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	3,000,000	24,000	27,000
Materials	10,100,000	11,000	21,100
Total US $ equivalent	13,100	35,000	48,100

Change in O&M Costs (+/-) Reduce 80% of current makeup water to the boilers along with necessary chemical treatment of that water.

Change in gas usage 1.6 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
1,600 (1000) m3/yr x $40/(1000) m3 = $64,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 5 months

Duration of benefit 20 years

Other benefits (describe) Improvement of environmental situation

Depends on other projects? NO

VOLGOGRAD GREENHOUSE "ZARYA"

SUMMARY

The greenhouse "Zarya" employs 500 people. The greenhouse occupies 12.5 hectares covered with glass. The main products are tomatoes, cucumbers, peppers and other vegetables. The total gas consumption for 1992 was 16.5 million m^3. This gas is fired in a boiler room containing 4 boilers. Heat produced is used for the process and outside customers - residential apartment buildings and family cottages. The fuel cost is approximately 25-30% of the unit cost of production.

It is recommended to replace old inefficient burners on boilers with new high efficient burners with associated controls.

The estimated cost and resulting savings are in the project profile sheet.

PROJECT PROFILE

Project: Burner replacement
Location: VOLGOGRAD
Implementing entity: Greenhouse "Zarya"

Description:
Install new burners on existing boilers with associated controls (total boilers capacity is 16 Gcal/hr).

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	1,600,000	19,000	20,600
Materials		169,000	169,000
Total US $ equivalent	1,600	188,000	189,600

Change in O&M Costs (+/-) NONE

Change in gas usage 2.1 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
2,100 (1000) m3/yr x $40/(1000) m3 = $84,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 8 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

RED OCTOBER
(Volgograd steel making plant)

SUMMARY

"Red October" is a steel making facility employing 17,000 people. It was constructed in three phases during 1900, 1937 and 1965, and covers an area of 2.5 km long by 1.0 km wide. The plant receives cast iron and scrap steel as feed stock to be processed in the open-hearth and electric arc furnaces. The intermediate products are steel billets, wire steel sheets and stainless steel. The annual production is 1,620,640 tons of steel. The total gas consumption for 1992 was 352.7 million m^3. The boiler room with the total capacity of 250 Gcal/hr including district heating consumes about 25% of gas supplied and the remainder is used by steel making process

The plant is currently marketing its products to Turkey, Germany, Taiwan, Europe, Cyprus, Southeast Asia and the United States. They are currently surviving by selling low carbon steel, but this is not an economically viable course of action.

It is recommended to replace old inefficient burners on boilers with new high efficient burners with associated controls.

It is recommended to install heat recovery equipment at boiler room and furnaces

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Burner replacement
Location: VOLGOGRAD
Implementing entity: "Red October"

Description:
Install new high efficient burners on 1 existing boiler with associated controls.
The boiler capacity is 100 Gcal/hr.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	6,000,000	41,500	47,500
Materials		800,000	800,000
Total US $ equivalent	6,000	841,500	847,500

Change in O&M Costs (+/-) NONE

Change in gas usage 7.92 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
7,920 (1000) m3/yr x $40/(1000) m3 = $316,800 / year

Could begin: Jan-95
Duration of project (from decision to completion) 12 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Heat recovery
Location: VOLGOGRAD
Implementing entity: "Red October"

Description:
Install recuperators and economizers at the existing boilers. The flue gas temperature is 230°C

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	4,500,000	30,000	34,500
Materials		525,500	525,500
Total US $ equivalent	4,500	555,500	560,000

Change in O&M Costs (+/-) NONE

Change in gas usage 7.9 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
7.900 (1000) m3/yr x $40/(1000) m3 = $316,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 10 months

Duration of benefit 20 years

Other benefits (describe) Reduce boilers pollution

Depends on other projects? NO

VOLGOGRAD PROTEIN VITAMIN CONCENTRATES FACTORY

SUMMARY

This factory manufactures agricultural additives for animal feed employing approximately 2,300 people. It started operation in 1975, and covers an area of 1.5 km long by 0.4 km wide. The factory produces an agricultural vitamin concentrate from natural gas and other feedstocks. The final product is 10,000 tons per year of goprin and 55,000 tons per year of poprin. The total gas consumption 40.0 million m^3 per year and about 28-30% of final product cost is energy cost. Gas is used as a part of feedstock for goprin production and also fired in nine drying ovens.

There are 2,300 employees. Most sales are in Russia, Yugoslavia, and Bulgaria. The plant has been trying to market the product in Korea but cannot meet the packaging requirements at this time. A problem with internal sales is that most former Commonwealth states don't pay.

It is recommended to replace old inefficient burners at drying ovens with new high efficient burners with associated controls.

It is recommended to install heat recovery equipment at ovens

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Burner replacement
Location: VOLGOGRAD
Implementing entity: Protein Vitamin Concentrates Factory

Description:
Installation of new burners on 2 existing drying ovens with associated controls

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	2,000,000	15,000	17,000
Materials		175,000	175,000
Total US $ equivalent	2,000	190,000	192,000

Change in O&M Costs (+/-) NONE

Change in gas usage 2.1 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)

2,100 (1000) m3/yr x $40/(1000) m3 = $84,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 8 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Heat recovery
Location: VOLGOGRAD
Implementing entity: Protein Vitamin Concentrates Factory

Description:
Install recuperators on the drying ovens

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	2,000,000	8,100	10,100
Materials		142,900	142,900
Total US $ equivalent	2,000	151,000	153,000

Change in O&M Costs (+/-) NONE

Change in gas usage 1.6 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)

1,600 (1000) m3/yr x $40/(1000) m3 = $64,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 8 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

Volgograd Scientific and Production Association
"VOLGOGRADNEFTEMASH" ("PETROV" FACTORY)

SUMMARY

The "Petrov" Factory presently employs 5683 people and operates with constant load for the whole year in two shifts. The factory manufactures oil refinery equipment, centrifugal oil pumps, gas separators, heat exchangers and auxiliary like gas heaters and small boilers for one family houses.

The plant process utilizes electricity, gas and steam. The cost of energy is 2.6% of the cost of final product. Annual gas consumption of the factory is 80.7 million m^3 per year. About 60% of the gas is used for boiler room and the remainder - for the technological process (heat treating furnaces, welding, cutting etc.).

The enterprise is a close type and therefore the JTC Team was not allowed to see the process. The information regarding the product was given in writing only after authorization by factory officials. The only facility that was observed is the boiler room. The total capacity of the boiler room is 263 Gcal/hr, no meters exist.

It is recommended to replace old inefficient burners at boilers with new high efficient burners with associated controls.

It is proposed to install one high efficient hot water boiler with the capacity of 100 Gcal/hr with the following demolition one or two existing boilers (depending on heat requirement by that time.

It is recommended to install condensate recovery system including condensate cleaning equipment and appropriate piping.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project:	Burner replacement
Location:	VOLGOGRAD
Implementing entity:	VOLGOGRADNEFTEMASH "Petrov" Factory

Description:
Installation of new burners on 2 existing boilers with associated controls (total boilers capacity is 63 Gcal/hr).

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	3,600,000	24,000	27,600
Materials		600,000	600,000
Total US $ equivalent	3,600	624,000	627,600

Change in O&M Costs (+/-)	NONE
Change in gas usage	5.6 million m3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE

Benefits (Cost of Gas Saved)

5,600 (1000) m3/yr x $40/(1000) m3 = $224,000 / year

Could begin:	Jan-95
Duration of project (from decision to completion)	10 months
Duration of benefit	20 years
Other benefits (describe)	Reduce pollution
Depends on other projects?	NO

PROJECT PROFILE

Project: Boiler replacement
Location: VOLGOGRAD
Implementing entity: VOLGOGRADNEFTEMASH "Petrov" Factory

Description:
Install a new high efficient hot water boiler with the capacity of 12,000 HP

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	18,000,000	64,000	82,000
Materials		6,490,100	6,490,100
Total US $ equivalent	18,000	6,554,100	6,572,100

Change in O&M Costs (+/-) NONE

Change in gas usage 6.8 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
6,800 (1000) m3/yr x $40/(1000) m3 = $272,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 12 months

Duration of benefit 20 years

Other benefits (describe) Reduce boilers pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Condensate recovery system
Location: VOLGOGRAD
Implementing entity: VOLGOGRADNEFTEMASH "Petrov" Factory

Description:
Install a condensate receiver with pumps in each autoclave shop, cleaning equipment, steam traps and piping.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	2,400,000	16,400	18,800
Materials	15,000,000	20,500	35,500
Total US $ equivalent	17,400	36,900	54,300

Change in O&M Costs (+/-) Reduce 85% of current makeup water to the boilers along with necessary chemical treatment of that water.

Change in gas usage 2.1 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
2,100 (1000) m3/yr x $40/(1000) m3 = $84,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 7 months

Duration of benefit 20 years

Other benefits (describe) Improvement of ecological situation

Depends on other projects? NO

VOLGOGRAD DRILLING EQUIPMENT FACTORY

SUMMARY

The factory produces drilling equipment for oil and gas industry. The only gas consumer at the factory is a boiler room with the annual gas consumption of 80 million m^3. The boiler room supplies heat to Drilling Equipment Factory and to a number of outside industrial customers (approximately 45% of the heating capacity is used to heat outside customers) and residential facilities.

The enterprise is a close type and therefore the JTC Team was not allowed to observe the entire facility. The only thing which was observed is the boiler room. The boiler room personnel was extremely cooperative and assisted the JTC Team very much in obtaining necessary information. The total capacity of the boiler room is 400 Gcal/hr and this is the largest industrial boiler plant, and also one of the largest district heating boiler plants.

It is recommended to replace old dual fuel burners with new high efficient gas burners with associated controls.

It is recommended to provide the facility with set of instrumentation for express localization of air leaks, flue gas analyzing, diagnostics and monitoring of boiler operation.

The insulation on some of the boilers is in a very bad condition. It is recommended to replace the insulation.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Burner replacement
Location: VOLGOGRAD
Implementing entity: Drilling Equipment Factory

Description:
Installation of new burners on 3 existing boilers with associated controls (total selected boilers capacity is 83 Gcal/hr).

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	6,300,000	31,000	37,300
Materials		780,000	780,000
Total US $ equivalent	6,300	811,000	817,300

Change in O&M Costs (+/-) NONE

Change in gas usage 7.3 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
7,300 (1000) m3/yr x $40/(1000) m3 = $292,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 12 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Insulation
Location: VOLGOGRAD
Implementing entity: Drilling Equipment Factory

Description:
Replace insulation on some of the existing boilers.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	4,000,000	16,500	20,500
Materials		162,000	162,000
Total US $ equivalent	4,000	178,500	182,500

Change in O&M Costs (+/-) NONE

Change in gas usage 1.4 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)

1,400 (1000) m3/yr x $40/(1000) m3 = $66,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 8 months

Duration of benefit 20 years

Other benefits (describe) NONE

Depends on other projects? NO

PROJECT PROFILE

Project: Portable control instrumentation
Location: VOLGOGRAD
Implementing entity: Drilling Equipment Factory

Description:
Implement a set of portable control instrumentation for control, diagnostic and monitoring.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	2,200,000	28,000	30,200
Materials		80,000	80,000
Total US $ equivalent	2,200	108,000	110,200

Change in O&M Costs (+/-) NONE

Change in gas usage 4.1 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
4,100 (1000) m3/yr x $40/(1000) m3 = $164,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 7 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

VORONEZH CERAMIC PLANT LTD.

SUMMARY

The Voronezh Ceramic Plant (VCP) is a joint stock company that was privatized after being purchased from the state by its staff. They produce a variety of interior and exterior tiles, pottery items and special (proprietary) pigmentations used in the ceramic industry. The company employs 1,500 people (70% female) and has the annual production rate of 4 million m^2 of tiles per year. The plant operates 24 hours a day in 3 shifts. The total annual gas consumption in 1992 was 40.8 million m^3.

VCP has prepared a plan for the modernization of their facilities and currently includes 3 phases of which only the first is clearly defined.

The first phase of modernization includes the reconstruction of the plant/department that produces floor tiles. Significant savings in gas, electric and water consumption are expected, as well as other environmental benefits.

A contract has been signed with an Italian firm, SACMI for this modernization for a cost of $12-13 million. SACMI, according to the VCP director, produces the best equipment/systems in the world for this industry. The proposed reconstruction includes the installation of all new equipment for the entire process of tile making. Some miscellaneous construction materials, other than equipment, have already been purchased and the actual site for the installation has been prepared. The construction period is estimated to last 18 months.

It is recommended to replace existing production line with new SACMI equipment.

It is recommended that glass fiber making kilns should be re-insulated and sealed at the ends were open flames protrude

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Replace Existing Production Line
Location: VORONEZH
Implementing entity: Ceramic Plant

Description:
Replace Existing Production Line with New Equipment

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	10,000,000	144,000	154,000
Materials		11,846,000	11,846,000
Total US $ equivalent	10,000	11,990,000	12,000,000

Change in O&M Costs (+/-) NONE

Change in gas usage 12,150 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
12,150 (1000) m3/yr x $40/(1000) m3 = $486,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 24 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

VORONEZH BUILDING MATERIALS COMPANY

SUMMARY

The Voronezh Building Materials Company (VBM) is a private, joint stock, company that currently produces insulation material for buildings and ships, and white construction bricks. It's annual consumption of gas averages 36.9 million m^3, although last years use was lower due to lower production. The expanding construction industry, particularly with private homes, indicates a higher demand for the near future.

The annual production rate is 300 million bricks. VBM operates in four shifts 12 hours each - every two shifts get the following day off.

Gas is consumed in two areas: boiler room and insulation ("mineral plates") material process. Planned expansion includes the construction of a new building to house new presses for production of bricks with holes and a building to house a new plant to produce automobile "accumulators" (catalytic converters). The automobile parts department is a joint venture with the Czech's. Another planned project is a new department for the production of steel pipes, 20-100 mm in diameter.

It is recommended to install heat recovery system with incorporated cleaning equipment.

It is recommended to replace old burners with new high efficient with associated control that will allow to reduce gas supply pressure.

It is proposed to reseal the 38 existing brick drying kilns by replacing gaskets to eliminate steam leaks.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Heat Recovery in Regenerator Kiln
Location: VORONEZH
Implementing entity: Building Materials Company

Description:
Install Heat Recovery System in Regenerator Kiln

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	1,000,000	16,000	17,000
Materials		58,000	58,000
Total US $ equivalent	1,000	74,000	75,000

Change in O&M Costs (+/-) NONE

Change in gas usage 0.864 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
864 (1000) m3/yr x $40/(1000) m3 = $34,560 / year

Could begin: Jun-94
Duration of project (from decision to completion) 6 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Burner replacement
Location: VORONEZH
Implementing entity: Building Materials Company

Description:
Install new high efficiency burners on existing boilers with associated controls

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	15,000,000	64,000	79,000
Materials		750,000	750,000
Total US $ equivalent	15,000	814,000	829,000

Change in O&M Costs (+/-) NONE

Change in gas usage 3.435 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)

3,435 (1000) m3/yr x $40/(1000) m3 = $137,412 / year

Could begin: Jan-95
Duration of project (from decision to completion) 6 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project:	Reseal 38 brick drying kilns
Location:	VORONEZH
Implementing entity:	Building Materials Company

Description:
Reseal the 38 existing brick drying kilns by replacing gaskets to eliminate steam leaks.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	5,700,000	24,000	29,700
Materials		128,000	128,000
Total US $ equivalent	5,700	152,000	157,700

Change in O&M Costs (+/-)	NONE
Change in gas usage	916,000 m3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE

Benefits (Cost of Gas Saved)

916 (1000) m3/yr x $40/(1000) m3 = $36,640 / year

Could begin:	Jan-95
Duration of project (from decision to completion)	12 months
Duration of benefit	20 years
Other benefits (describe)	
Depends on other projects?	NO

VORONEZH LOCOMOTIVE MAINTENANCE PLANT

SUMMARY

The Voronezh Locomotive Maintenance Plant (VLM) is responsible for the repair and maintenance of locomotive engines and the production of high wear parts, such as wheels. Gas is consumed in three areas: boiler plant, forging kilns and metal cutting equipment. The plant operates in two shifts eight hours each and employs 3,000 people. The annual gas consumption is 29.9 million m^3/per year.

It is recommended to install automatic controls on kilns.

It is proposed to install condensate return equipment, as currently there is no condensate returned to the boiler room.

There are 2,500-3,000 meters of above ground steam piping with very poor insulation. New insulation should be added to reduce the heat-losses.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Install Controls
Location: VORONEZH
Implementing entity: Locomotive Maintenance Plant

Description:
Install automatic controls on 29 kilns

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	2,175,000	16,000	2,175
Materials	216,000,000		216,000
Total US $ equivalent	218,175	16,000	218,175

Change in O&M Costs (+/-) NONE

Change in gas usage 406,000 m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
406 (1000) m3/yr x $40/(1000) m3 = $16240 / year

Could begin: Jan-95
Duration of project (from decision to completion) 6 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Condensate recovery system
Location: VORONEZH
Implementing entity: Locomotive Maintenance Plant

Description:
Install a condensatereturn equipment including receivers, pumps and piping as well as cleaning equipment.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	2,400,000	12,000	14,400
Materials	15,000,000	20,500	35,500
Total US $ equivalent	17,400	32,500	49,900

Change in O&M Costs (+/-) Reduce 85% of current makeup water to the boilers along with necessary chemical treatment of that water.

Change in gas usage 0.7 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
700 (1000) m3/yr x $40/(1000) m3 = $28,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 7 months

Duration of benefit 20 years

Other benefits (describe) Improvement of ecological situation

Depends on other projects? NO

VORONEZH PLANT OF ALUMINUM BUILDING MATERIALS

SUMMARY

The Voronezh Aluminum Plant (VAP) produces a variety of aluminum products, such as panels, tiles, window/door frames etc., used in the construction industry. About 20 different products constitute the 900 tons of annual production. The plant employs 2,000 workers in three equal shifts of production. There are 10 buildings of different size housing several departments.

The main areas of gas consumption include the boiler room, the drying equipment and the Forging Department. The annual gas consumption for 1992 was 24 million m^3. The pressure of the gas supply is 6 atm which is reduced down to approximately 1 kg/cm^2.

During The JTC Team visit no photographs were allowed and tour and information were limited.

Most of the equipment that operate with gas are relatively new (5-10 years old). They are of Japanese made and do not offer opportunities for energy efficiency, as they are fairly modern.

The only improvement that may affect the overall efficiency is the installation of automatic controls and new high efficient burners. There is also a need to retube the steam boilers and replace the heat exchangers. Additional maintenance needs include the replacement of pumps and ventilation units.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project:	Burner replacement
Location:	VORONEZH
Implementing entity:	Aluminum Materials Plant

Description:
Install new high efficiency burners on existing boilers with associated controls

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	3,200,000	32,000	35,200
Materials		500,000	500,000
Total US $ equivalent	3,200	532,000	535,200

Change in O&M Costs (+/-)	NONE
Change in gas usage	1.9 million m3
Change in other fuel usage	NONE
Other input/output changes (value)	NONE

Benefits (Cost of Gas Saved)

1,900 (1000) m3/yr x $40/(1000) m3 = $76,000 / year

Could begin:	Jan-95
Duration of project (from decision to completion)	6 months
Duration of benefit	20 years
Other benefits (describe)	Reduce pollution
Depends on other projects?	NO

PROJECT PROFILE

Project: Control replacemer
Location: VORONEZH
Implementing entity: Aluminum Materials Plant

Description:
Install automated controls on steam boilers

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	1,125,000		1,125
Materials	25,000,000		25,000
Total US $ equivalent	26,125		26,125

Change in O&M Costs (+/-) NONE

Change in gas usage 950,000 m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
950 (1000) m3/yr x $40/(1000) m3 = $38,000 / year

Could begin: Jan-95
Duration of project (from decision to completion) 6 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

VORONEZH BRICK FACTORY

SUMMARY

The Voronezh Brick Factory (VBF) is a joint stock company that produces red bricks used in the local construction industry. VBF employs 300 workers in 3 shifts and operates 24 hours a day. The total annual gas consumption of the factory is 8.2 million m^3. Three kilns used to cure the bricks account for most of the gas consumption. Each kiln produces approximately 12 million bricks annually. The first kiln was built in 1972, the second in 1980 and the third in 1989. Approximately 18-20% of the cost of bricks is attributed to energy. Gas and electricity costs are about 10 million rubles per month. VBF anticipates increasing demand for their product with the new private house and industrial construction in the upcoming years and expressed the urgency to expand their operations. The director of VBF also expressed interest for foreign specialists to investigate their process and recommend improvements.

It is recommended to construct a new kiln with larger capacity to replace the existing kiln. Aside for the energy efficiency, the new kiln will produce higher quality bricks (shape, strength & color) and will reduce some of the environmental problems.

Alternatively, to maintain existing kilns:

Replace existing hot air ducts (1m x 300m each) used for heat recovery from the cooling section of the kilns. Ducts are significantly damaged and deteriorated resulting in substantial heat losses.

Improve the insulation of the existing kilns, ensure that openings, such as end-doors (doors did not close properly leaving large cracks) are properly sealed and replace the burners with modern counterparts.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Install new kiln
Location: VORONEZH
Implementing entity: Voronezh Brick Factory

Description:
Construct a new kiln with larger capacity to replace the existing kiln.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	500,000,000	96,000	596,000
Materials		3,404,000	3,404,000
Total US $ equivalent	500,000	3,500,000	4,000,000

Change in O&M Costs (+/-) NONE

Change in gas usage 1.148 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
1,148 (1000) m3/yr x $40/(1000) m3 = $45920 / year

Could begin: Jan-95
Duration of project (from decision to completion) 24 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Improve insulation of the existing kilns
Location: VORONEZH
Implementing entity: Voronezh Brick Factory

Description:
Improve the insulation of the existing kilns and seal doors

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	1,500,000	8,000	9,500
Materials	142,000,000		142,000
Total US $ equivalent	143,500	8,000	151,500

Change in O&M Costs (+/-) NONE

Change in gas usage 172,000 m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)

172 (1000) m3/yr x $40/(1000) m3 = $6,888 / year

Could begin: Jan-95
Duration of project (from decision to completion) 8 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Install heat recovery ducts
Location: VORONEZH
Implementing entity: Voronezh Brick Factory

Description:
Replace existing hot air heat recovery ducts from the cooling section of the kilns.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total($US93)
Labor	2,150,000		2,150
Materials	250,000,000		250,000
Total US $ equivalent	252,150		252,150

Change in O&M Costs (+/-) NONE

Change in gas usage 574,000 m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved)
574 (1000) m3/yr x $40/(1000) m3 = $22960 / year

Could begin: Jan-95
Duration of project (from decision to completion) 8 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

VORONEZH HEAVY EXCAVATOR PLANT

SUMMARY

The Voronezh Heavy Excavator Plant (VHE) is a joint stock or privatized company that produces a variety of excavation equipment, differing in size, capacity, function and features. The main products include 30, 40, and 50 ton excavators. Prices vary depending on the customer, yet typically a 25% profit is expected. All of the raw materials and components are domestic, making these products 100% Russian. Approximately 70% of all components are manufactured in this facility. The entire plant consist of 30 buildings including workshops, warehouses and offices.

Production is based on contracts. The production cycle ranges between 3-4 months. The current monthly output is 65 units of different sizes, while the full capacity is about 125 units. VHE has established 50 service stations throughout Russia and the expect to introduce some in the west in order to expand their exports which are currently limited to eastern countries.

The total annual gas consumption is 27.1 million m^3. Gas is used predominantly in the Forging Department, the Painting and Drying Department, the Parts Department (No. 4), the Thermal Cutting Department and the Boiler Room. It is supplied at about 3 atm and reduced to 0.4 atm for most applications. Gas consumption accounts for about 15% of the total energy requirements.

It is recommended to reconstruct the two kilns in the Forging Department.

It is proposed to replace burners on four existing steam boilers with new high efficient burners with associated controls.

The estimated cost and resulting savings are in the project profile sheets.

PROJECT PROFILE

Project: Kiln reconstruction
Location: VORONEZH
Implementing entity: Vorinezh Heavy Excavator Plant

Description:

Reconstruct two existing kilns in the Forging shop.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	6,600,000	17,000	23,600
Materials		180,000	180,000
Total US $ equivalent	6,600	197,000	203,600

Change in O&M Costs (+/-) NONE

Change in gas usage 0.113 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved per 1 Year)
113 (1000) m3/yr x $40 / (1000) m3 = $ 29,8 4,520

Could begin: Jan-95
Duration of project (from decision to completion) 24 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

PROJECT PROFILE

Project: Burner replacement
Location: VORONEZH
Implementing entity: Vorinezh Heavy Excavator Plant

Description:
Replace old burners at four boilers with new high efficient burners with associated controls.

Costs	Local (Ru, mid '93)	Foreign ($US93)	Total ($US93)
Labor	4,800,000	16,000	20,800
Materials		464,000	464,000
Total US $ equivalent	4,800	480,000	484,800

Change in O&M Costs (+/-) NONE

Change in gas usage 1.8 million m3
Change in other fuel usage NONE
Other input/output changes (value) NONE

Benefits (Cost of Gas Saved per 1 Year)
1,800 (1000) m3/yr x $40 / (1000) m3 = $ 29,8 72,000

Could begin: Jan-95
Duration of project (from decision to completion) 10 months

Duration of benefit 20 years

Other benefits (describe) Reduce pollution

Depends on other projects? NO

Table 10.6. Checklist--Onshore Oil and Gas Development

1. **Production**

- Production Zone(s): Reserves, depth, area, structure, oil/gas/water ratios, oil type, gas type(s), pressures.
- Operations: Site preparation, well spacing, start-up period (production rate, product transportation, field life, waste sanitary wastes), pollution control, monitoring, spill response and reclamation plans.
- Air Emissions: Emission quantity and, where applicable, composition: dust, venting, flaring, waste pit burning, combustion, equipment emissions, oil spills and leakage.
- Waste Water Discharge: Projected quantity and composition; treatment/disposal method (production water, sanitary wastes).
- Services: Utilities (type, source, load), roads, airfields, rail, fire protection, security.
- Landuse: Area of field, transportation and utility routes, pipelines, buildings and structures (at field and stations along pipeline).
- Equipment: Type and number for site preparation, drilling, production, transportation, waste water separations and disposal, waste haulage, pumping, reclamation, transport of supplies and workers.
- Supplies: Drilling muds, pipe, chemicals, water, fuel.
- Staffing: Construction, production, reclamation phases, number and skills, source, housing plans.

2. **Environmental Resources**

- Geology: Stratigraphy, structure, fracture patterns, seismic history.
- Groundwater: Depth to and thickness of aquifers, quality and quantity, hydraulics, recharge, uses.
- Surface Water: Quality, quantity, seasonal variations, uses.
- Soil: Soil profile (depth, type, characteristics).
- Vegetation: Types, density, rare or significant species or communities, wetlands.
- Wildlife: Resident and casual, populations, rare or significant species, significant habitat.
- Topography: Drainage patterns, elevations and slopes, prominent features.
- Climate: Precipitation patterns (amount, frequency, type), air quality, wind patterns (direction, speed, frequency), temperature, climatic zone.

3. **Socio-Economic Factors**

- Nearby communities: Location, access, population (number, demographic and social characteristics); economy (employment rate, income distribution, tax base); services (types, capacity, adequacy) and housing; concern is the ability to (a) provide workforce, (b) service new development and (c) absorb and adjust to growth (worker/family in-migration).
- Land Use: Intensive and casual, full time and seasonal, actual and projected, specially designated areas (parks, refuges, reservations, wilderness), man-made features (structures, roads, utilities).
- Cultural: Historic sites, archaeologic sites, native religious or harvest sites.

4. **Regulatory Framework**

- Applicable environmental laws, regulations, policies, standards, and requirements; monitoring and enforcement: air, water, waste, noise, reclamation, land use controls and approvals, cultural and historic resource protection.
- Designation and protection of special areas and resources: parks, refuges, wilderness, sensitive ecological communities, threatened species of flora and fauna, native communities (including religious sites and harvesting/hunting or subsistence areas).
- Authority/willingness to require special mitigation: community assistance, staged or phased development, isolate development workforce, pre- and post-development studies and monitoring (with corrective action as needed), worker training, mass transit of workforce.

LIST OF ANNEXES

Annex A	TOR for EA dated September 17, 1993
Annex B	Major Laws, Regulations, and Programs of the Russian Federation Relevant to EA
Annex C	Data Checklist for Project Specific EAs for Pipeline Replacement, The World Bank Technical Paper Number 154, October 1991
Annex D	Requirments of the Committee on Federal Sanitary and Epidemiological Inspection
Annex E	Occupational Health, General Guidelines for Industrial Projects, the World Bank, April 1984
Annex F	Correspondence and data received from Committees for Ecology in the Cities of Ryazan, Saratov, Volgograd and Voronezh

ANNEX A

TOR for EA dated September 17, 1993

IPT

ENVIRONMENTAL ASSESSMENT (EA-OVOS) FOR RUSSIAN FEDERATION AND THE WORLD BANK

GAS DISTRIBUTION REHABILITATION PROJECT FOR THE CITIES OF SARATOV,VOLGOGRAD,VORONEZH AND RYAZAN

Table of Contents

1.0 Introduction

- ~~Purpose of the project~~ ~~STET~~ Purpose for EA-OVOS
- Description of the project
- Implementation mechanisms
- Reviewing agencies for the EA-OVOS
- Project schedule

6.0 insert here

include 6.0 in section 2.0

2.0 Project Objectives

- Reduction of distribution system gas losses
- Improved system reliability
- Improved efficiency of gas distribution
- Improved efficiency of gas at the end user
- Improvement in air quality
- Reduced reliance on alternative fuels in emergency situations
- Increase in commercial viability of the city's gas distribution enterprise
- Maintenance and improvement of public safety

3.0 Baseline Data

describe what type of data should be gathered when specific projects are defined.

- Project locations
- Generalized land uses
- General demographic characteristics
- Ambient air quality soil, hydrology, geologic - qualitative not qualification
- Meteorological conditions
- Availability of emergency response plans and services
- Social & economic data

4.0 Environmental Assessment Requirements

- World Bank Operational Directive 4.01
- World Bank Environmental and Occupational Health and Safety Guidelines
- Russian Federation Environmental Protection Legislation

include this chow 1.0

5.0 Study Area

- City boundary
- Gas distribution system boundaries

include this in the new section 2-0

250

6.0 Description of the Proposed Projects

replaced in 2.0

- Replacement of Gas Distribution Pipe
- Gas Distribution System Controls
- Upgrading Corrosion and Cathodic Protection Systems
- Improvement of Construction & Maintenance Equipment
- Upgrading of City Gate Stations
- Metering in residential blocks/commercial units
  (to be continued) • Boilers in apts complexes

7.0 Significant Impacts on the Environment

Beneficial & Adverse impacts

- Reduced leak potential
- Reduced emissions of methane
- Lower emissions of carbon monoxide, nitrogen oxides and particulate matter
- Reduced reliance on alternative fuels,
- Reduction of the of greenhouse effect exists
- Potential for gas conservation
- Potential health and safety hazards
  Potential for increase in local air emissions
  Potential for disruption of soil, water, and biological resources
  Potential for disruption of human activities

8.0 Analysis of Project Alternatives

(three scenarios to be described)

9.0 Mitigation Strategies

- Description and technical details of mitigation measures
- Institutional arrangements
- Implementation schedule
- Construction code and environmental compliance monitoring and reporting procedures
- Technical assistance programs
- Staff development plans
- Procurement of equipment and supplies
- Air Quality--dust emission control during construction
- Noise mitigation
- Social and Economic Environment
- Safety and Health
- Public Information Program during implementation

10.0 Public Participation

? out

- Organizations to be contacted
- Documentation of issues
- Programs to be addressed in the project

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Ambient Air Quality
Project Emissions
Meteorological Information

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~~District Heating Plants Distribution:~~
Study Area
Pipe Replacement Detail
Cathodic Protection Illustration
Meter for Residential Unit
Leak Detector

Documents Consulted

Ministries, other Government Agencies, and Individuals Consulted

Golubova Svetlana
Ministry of Environment
Ministry of Fuel and Energy

Annexes

ANNEX B

Major Laws, Regulations, and Programs of the Russian Federation Relevant to EA

Annex B

Major Laws, Regulations, and Programs of the Russian Federation Relevant to EA

1. Water Code of the RSFSR 06/30/72
2. Land Code of the RSFSR 04/25/91
3. Forestry Code of the RSFSR 08/08/78
4. Laws on the RSFSR (the Russian Federation):
   - "On Subsoil (Subterranean) Resources: 05/04/92
   - "On Property in the RSFSR" 12/24/90
   - "On Sanitary - Epidemiological Well-Being of the Population 04/19/91
   - "On Local Self-Government 07/06/91
   - "On Payment for Land" 11/11/91
   - "On Introduction Changes and Amendments in Articles 6, 8, and 12, of the law of the RSFSR 'On Payment for Land'" 02/26/92
   - "On Enterprises and Entrepreneurial Activity in the RSFSR" 12/25/90
   - "On Protection of Consumer's Rights" 02/07/92
   - "On Regional, Provincial Soviet of Peoples Deputies and Regional, Provincial Administration" 03/05/92
   - "On Protection and Use of Historical and Cultural Monuments" 12/15/78
   - "On Air Protection" 07/14/82
   - "On Protection and Use of Animal World" 07/14/82
   - "On Ensuring of Economic Basis for Sovereignty of the RSFSR" 10/31/90
   - "On Investment Activity in the RSFSR" 06/25/91
   - "On Environmental Protection" 12/19/91
   - "On Foreign Investments in the RSFSR" 07/04/91
5. Resolutions of the Council of Ministers of the RSFSR:
   - "On Urgent Measures for Improvement of Ecological Situation in the RSFSR in 1911-1995 and Main Directions of Environmental protection in 13 Five-Year Plan and up to Year 2005" 03/16/90
   - "On Approval for 1991 of Payment Rates for Emissions of Environmental Pollutants and Procedures for their Application" 01/09/90
   - "On Duly Authorized State Bodies of the Russian Federation in the Field of Environment Protection" N 943 ..... 09/22/93
   - "On Approval of the Status of Gosudarstuennoi Ecologichesikoi Ekspertize" (SEIAR) N 942 ..... 09/22/93
6. "Temporary Instruction on Ecological Evaluation Within Preproject and Project Documentation" (with 10 Attachments) and a List of "Major Legal, Normative, and Methodological Materials, Recommended for Application when Substantiating Ecological Safety of Objects of Economic and Other Activity" 07/16/92

7. "On EIA of Economic Activity Projects," USSR Goskompriroda Temporary Instruction with Attachments 12/13/90

8. "Temporary Instruction on Procedure for EIA when Elaborating Technical-Economic Justifications and Projects for Construction of Economic Objects and Complexes,' USSR Goskompriroda'" 15/18/90

9. "Status of the Ministry of Environmental Protection and Natural Resources of the Russian Federation", Approved by the Government Resolution No. 996 ..... 12/18/90

10. "Recommendatory Legal Act "On the Principles of ecological Safety in the CIS States", Approved by CIS Inter-Parliamentary Assembly; (Published in "ECOINFORM", No. 2 February, 1993) 12/24/92

11. Federal Aimed Complex Scientific Program "Ecological Safety of Russia (1993-1995)"

12. "On State Ecological Expertize (SEIAR) of preproject and project documentation", circular by the Minister, MEPNR 08/07/92

13. "On State Ecological Expertize (SEIAR) of Enterprises with Foreign Investment", Instruction by MEPNR and RAICD" 05/21/93

ANNEX C

Data Checklist for Project Specific EAs for Pipeline Replacement,

The World Bank Technical Paper Number 154, October 1991.

Table 10.6. Checklist--Onshore Oil and Gas Development

1. **Production**

- Production Zone(s): Reserves, depth, area, structure, oil/gas/water ratios, oil type, gas type(s), pressures.
- Operations: Site preparation, well spacing, start-up period (production rate, product transportation, field life, waste sanitary wastes), pollution control, monitoring, spill response and reclamation plans.
- Air Emissions: Emission quantity and, where applicable, composition: dust, venting, flaring, waste pit burning, combustion, equipment emissions, oil spills and leakage.
- Waste Water Discharge: Projected quantity and composition; treatment/disposal method (production water, sanitary wastes).
- Services: Utilities (type, source, load), roads, airfields, rail, fire protection, security.
- Landuse: Area of field, transportation and utility routes, pipelines, buildings and structures (at field and stations along pipeline).
- Equipment: Type and number for site preparation, drilling, production, transportation, waste water separations and disposal, waste haulage, pumping, reclamation, transport of supplies and workers.
- Supplies: Drilling muds, pipe, chemicals, water, fuel.
- Staffing: Construction, production, reclamation phases, number and skills, source, housing plans.

2. **Environmental Resources**

- Geology: Stratigraphy, structure, fracture patterns, seismic history.
- Groundwater: Depth to and thickness of aquifers, quality and quantity, hydraulics, recharge, uses.
- Surface Water: Quality, quantity, seasonal variations, uses.
- Soil: Soil profile (depth, type, characteristics).
- Vegetation: Types, density, rare or significant species or communities, wetlands.
- Wildlife: Resident and casual, populations, rare or significant species, significant habitat.
- Topography: Drainage patterns, elevations and slopes, prominent features.
- Climate: Precipitation patterns (amount, frequency, type), air quality, wind patterns (direction, speed, frequency), temperature, climatic zone.

3. **Socio-Economic Factors**

- Nearby communities: Location, access, population (number, demographic and social characteristics); economy (employment rate, income distribution, tax base); services (types, capacity, adequacy) and housing; concern is the ability to (a) provide workforce, (b) service new development and (c) absorb and adjust to growth (worker/family in-migration).
- Land Use: Intensive and casual, full time and seasonal, actual and projected, specially designated areas (parks, refuges, reservations, wilderness), man-made features (structures, roads, utilities).
- Cultural: Historic sites, archaeologic sites, native religious or harvest sites.

4. **Regulatory Framework**

- Applicable environmental laws, regulations, policies, standards, and requirements; monitoring and enforcement: air, water, waste, noise, reclamation, land use controls and approvals, cultural and historic resource protection.
- Designation and protection of special areas and resources: parks, refuges, wilderness, sensitive ecological communities, threatened species of flora and fauna, native communities (including religious sites and harvesting/hunting or subsistence areas).
- Authority/willingness to require special mitigation: community assistance, staged or phased development, isolate development workforce, pre- and post-development studies and monitoring (with corrective action as needed), worker training, mass transit of workforce.

ANNEX D

Requirements of the Committee on Federal Sanitary and Epidemiological Inspection

Управляющему трестом
"Рязаньгоргаз"
Евстефееву А.С.

24 05

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"По вопросу реконструкции
газопровода г.Рязани".

В ходе проектных работ по реконструкции газопровода г.Рязани следует предусмотреть:

1. Выполнение требований СНиП 2.04.08-87 "Газоснабжение" и "Правил безопасности в газовом хозяйстве".
2. Мероприятия по газофикации в соответствии с генеральным планом развития г.Рязани.
3. Применение передовых технологий обеспечивающих более рациональное использование топлива.
4. Мероприятия по рекультивации земли и восстановлению зеленых насаждений.
5. Автоматизированную систему управления в системе газоснабжения.
6. Газоснабжение куротного п.Солотча и других поселков, включенных в черту г.Рязани.
7. Современные методы производства строительно-монтажных работ, обеспечивающих оптимальные условия труда работающих.
8. Мероприятия по ликвидации мелких котельных и перевод котельных, работающих на твердом и жидком топливе на газ.
9. Решения по охране окружающей среды в соответствии с СНиП 2.05.06-85 "Магистральные трубопроводы".

Главный государственный
санитарный врач г.Рязани Максимов Е.А.

Annex D

Requirements of the Committee on Federal Sanitary and Epidemiological Inspection

The preparers of the EA met with Mr. E.A. Maximov, Chief Federal Medical Doctor of Ryazan on August 23, 1993. Mr. Maximov prepared a statement on his department's requirements for pipe replacement. This statement follows:

From: Committee on Federal Sanitary and Epidemiological Inspection

To: A.S. Yevstefeyev,
Manager of the Trust "Ryazangorgas"

Subject: Reconstruction of gas conduit in Ryazan

In the following course of reconstruction of the gas conduit in Ryazan, the following measures should be taken:

1. Following instructions given in SNiP 2.04.08-87: "Gas Supply" and "Safety Rules for Maintenance of the Gas Utilities."

2. Measures for provision of gas supply in accordance with the Master Plan for the city of Ryazan.

3. Using advanced technologies which provide more economical use of fuel.

4. Measures for cultivation of land and restoration of greenery.

5. Using automatic control systems in the gas supply business.

6. Gas supply of a resort "Solotech" and other resorts within the city limit of Ryazan.

7. Using high technology for production and construction works, which will provide optimal working conditions for the employees.

8. Measures for liquidation of small boiler houses and remodelling of the boiler houses which burn solid and liquid fuel, into boiler houses which burn gas.

9. Resolutions on environmental protection in accordance with SNiP 2.05.06-85: "Conduits."

Chief Federal
Sanitary Doctor
of Ryazan

E.A. Maximov

ANNEX E

Occupational Health, General Guidelines for Industrial Projects,

the World Bank, April 1984

THE WORLD BANK APRIL 1984

OCCUPATIONAL HEALTH

GENERAL GUIDELINES FOR INDUSTRIAL PROJECTS

Introduction

1. Even in the United States, the estimates for new cases of occupational diseases vary considerbly. The Public Health Service estimate is 390,000 new cases of occupational diseases per year. This should be compared with 1 million new cases per year in another study. On the other hand, statistics of excess mortality among workers from several major industries suggest that as many as 100,000 deaths occur per year as a result of occupational diseases.

2. Figures for LDC's are not known but visits to several industrial sites by members of the Office of Environmental Affairs have shown that the situation is generally worse than in the United States. As a result, the World Bank feels morally obligated to eliminate as best as possible the problems of occupational health in the industrial projects it is financing.

3. This guideline lists the most common health hazards in a project. The sponsor should be aware of our concern for the continuing good health of a firm's employees. To minimize the existing danger, employees should know the potential hazards facing them. The sponsor, on the other hand should have a health care program stressing the prevention and the cure of the industrial diseases associated with the project. This should include pre-employment and regular medical examinations as well as the tests and analyses necessary for the detection of the diseases. A complete medical record should be carefully kept for each employee.

Definition of Occupational Diseases

4. A joint ILO-WHO committee has defined the objectives of an occupational health program as follows:

> The promotion and maintenance of the highest degree of physical, mental and social well being of workers in all occupations; the prevention of workers diseases caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psycological condition.

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5. We shall define as "occupational health" hazards those resulting in a slow impairment of health. These hazards can be classified in four categories.

Biological:	bacteria, fungi, insects;
Chemicals:	toxic chemicals, dusts and gases. Their action can be mutagenic, teratogenic or carcinogenic;
Physical:	heat, noise, radiation or vibration;
Stress:	created by chemical, ergonomic, physical or psychological factors.

The hazard arises through the interaction of the environment, the job and the worker.

6. Prevention should be the rule and cure the exception. Engineering solutions should be preferred to individual protection. For instance, a process modification should be adopted instead of compelling operators to work with a respirator.

Specific Health Hazards

Carcinogens

7. There is mounting evidence that 75 to 95% of all cancers are environmental. It is however not easy to prove that a cancer has been induced by occupational factors and still more difficult to determine the exact cause.

8. Some of the most common chemicals or physical phenomena able to create cancer are asbestos, VCM, tar, dyestuffs, aniline, chromates, arsenic, several organic molecules containing benzene, sunlight, X-rays, ionizing radiation.

9. A tumor can appear at the point of contact (asbestos in lungs) or some other body site (VCM in liver cancer).

10. New chemicals are introduced by the hundreds every year and old chemicals first thought to be safe are now suspected of being carcinogenic. For this reason the number of materials with carcinogenic properties will grow with time.

11. In any World Bank project involving chemicals the following question should always be asked: Is any of these chemicals a carcinogen?

Dusts

12. Any type of dust is in the long run harmful to the lungs and consequently to the cardiovascular system.

13. The most common dust diseases are silicosis (silica dust) asbestosis (asbestos dust) pneumoconiosis (coal dust). (1) In the United States the population at risk from these diseases is reported to be between 2 and 2.5 million.

Ergonomic Factors

14. The study of ergonomics include physiological and psychological stresses of the human body resulting in fatigue, errors, accidents and sometimes diseases.

15. These are strong suspicions that stress is a major cause of heart disease and also of other degenerative diseases. Stress can also affect mental health.

16. The combined effects of stress (heat or noise) with other health hazards is often synergistic and the synergism may be much more important than the simple effect of stress at low levels.

Heat Stress

17. This type of stress is commonly encountered in mining and in any industry where heating of materials takes place. The work performance is greatly affected by the temperature and the humidity of the environment.

18. The heat generated by the human body must be dissipated to keep the temperature at 37°C. Like any other heat exchanger, the body has a temperature corresponding to maximum efficiency. If the temperature changes, the efficiency decreases.

19. The effects may be physical and psychological with accrued fatigue, poor coordination and additional mistakes. If the stress is too intense, heat stroke may develop and could be fatal; heat exhaustion (loss of body water) and heat cramps (loss of salt) may also be present.

20. The cardiovascular system suffers from heat stress. Synergism between heat stress and the other hazards (i.e. toxicants) has been proven and this raises questions about the general applicability of TLV's for heat (see references).

Noise

21. Noise contributes to hearing loss and accidents but also triggers physiological and psychological body changes. The cardiovascular, endocrine and neurological functions are the most affected. Epidemiological studies show that cardiovascular problems, neurological changes and social conflicts are more frequent in high level noise industries.

22. The limit of 90 dBA is primarily set to conserve hearing. Because of probable synergism between noise and other stress factors, the level should be decreased below 90 dBA although there are, at present, insufficient results upon which to base a safe level.

Radiation

23. Any type of radiation can be harmful. Ultraviolet radiation may burn the skin and the eyes and cause skin cancer. Infrared may have the same effects except for cancer.

24. Ionizing radiation coming from radioactive materials or electromagnetic sources harms body tissue. They include alpha and beta particles, neutrons, protons, as well as gamma and X-rays. Their biological effects may be somatic or genetic.

25. Somatic effects include dermatitis, skin cancer, leukemia, cataract, sterility and a shorter life span. Genetic effects are also very dangerous but less well known. They can produce mutations. The long term effect is dependent upon whether the mutant is able to survive or to reproduce.

Toxic Chemicals

26. The toxic chemicals, listed at over 12,000 in the United States, are the carcinogens (see above), the gases, the metals or the chemical compounds affecting health or endangering life. They can enter the human body via the mouth, the skin, the eyes, the respiratory tract or any other route.

27. Local effects include injury to the skin, the eyes and the mucous membranes. Systemic effects happen when the chemical enters the body and attacks the internal organs

28. Gases, even the non-toxic ones, reduce the oxygen content of the air and this in turn can lead to asphyxiation which itself can result in death or permanent brain damages (i.e. accidents with carbon dioxide and nitrogen). Sulfur dioxide, sulfur trioxide, sulfuric acid mist, chlorine, ammonia, nitrogen oxides and alkali mists cause respiratory diseases. Long term exposure leads to a chronic condition.

29. Industrial solvents can cause anemia, liver and kidney damage, cardiovascular diseases and neurological disorders. Benzene, phenols, carbon disulfide, and carbon tetrachloride are examples of products widely used but also very dangerous to health.

30. Toxic metals include lead, mercury, cadmium, nickel, gold and beryllium. Chronic exposure produces systematic effects often resulting to shorter life expectancy.

31. Pesticides exposure may result in irreversible neurological disorders.

Vibration

32. Vibration can be a serious form of stress causing anemia and lesions in the gastrointestinal tract resulting in internal hemorrhaging.

Combined Hazards

33. Most often the combination of two or more hazards is synergistic. In the working world, the employee is confronted not by isolated hazards but by several of them. Yet studies of combined hazards are very rare and most synergisms are likely to be found after their effects have taken place. Added caution should be the rule if combined hazards are present.

Severity

34. The measure of severity in health hazards is very difficult. They are slow acting, cumulative; their effects may not be visible for several years. The magnitude of these effects will vary with non-occupational factors, like health of the individual, climate, diet, etc. For all these reasons, no severity index exists as yet for occupational diseases with the consequences that the seriousness of the hazards is not recognized. The chance for a worker handling benzene and dying from cancer, may be greater than the chance of another man having a serious accident. Precautionary measures will be taken to prevent the accident. Much less will be done to protect health against the deleterious effect of benzene.

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THE WORLD BANK APRIL 1984

SAFETY

GENERAL GUIDELINES FOR INDUSTRIAL PROJECTS

Introduction

1. In the United States alone, work related disabling injuries amount to 2.8 million and cause 14,000 deaths every year. Worse than these figures is the fact that the increase of the reported injury rate in industry reached 29% from 1951 to 1970.

2. Although figures for LDC's are not known or are much less reliable, it is common knowledge that the situation there needs improving. The World Bank has, in consequence, a moral obligation to make certain that the necessary safety requirements are taken in the industrial projects it is going to finance.

3. This guideline lists the most common safety hazards to look for when appraising a project. The sponsor should be made aware of our concern for the proper handling of the safety problems. This includes the safety training of the employees, the organization of safety in the plant (procedures - meetings - supervision) and the involvement of the top management in the safety program.

Definition of Safety Hazards

4. Safety hazards are those causing burns, electrical shocks, cuts, bruises, sprains, broken bones and loss of limb, eyesight or hearing. They result in immediate and sometimes violent harm, they are associated with industrial equipment or processes and often involve tasks requiring training and care.

5. We shall only deal in this guideline with the hazards defined in the preceding paragraph. The same hazards resulting in a slow impairment of health will be dealt with in the "Occupational Health" guide.

Specific Safety Hazards

Dangerous Stationary Machines

6. Machine moving parts, if unshielded, can cause injury. Typical machines do the following functions: sawing, molding, rolling, cutting, mixing, flattening, bending, grinding. They have moving parts which can cut, hack, mutilate and possibly kill.

Electricity

7. Electrocution from contact with live conductors or other electrical equipment constitutes the most common hazard next to noise. The higher the voltage, the greater the danger. Proper grounding and shielding with strict observance of electrical construction codes will decrease the hazard without eliminating it totally.

Ergonomic Factors

8. The study of ergonomics includes physiological and psychological stresses of the human body resulting in fatigue, errors and accidents. Ergonometric factors such as temperature, lighting, humidity, accessibility to control, shape and size of tools, will influence not only the well-being but also the efficiency of the worker.

Eye Protection

9. Machines throwing off dust particles or flying chips should be properly shielded to avoid any eye damage. Chemical spills, leaks, and splashes are also dangerous to the eyes. Eyeglasses or eye goggles should be mandatory for certain types of jobs.

Falls

10. Falls are a major cause of industrial accidents. They could be easily prevented by guardrails, warning posters, safety belts and nets.

Fires and Explosions

11. Rupture of pressurized vessels or high speed of certain chemical reactions result in explosion often causing extensive fires. Poor housekeeping, ignorance or disregard of smoking rules or open fire regulations may also result in fires or explosions. Fire insurance should be a double protection for the worker. First, the insurer will inspect the premises and point out the problems; secondly, the insurance will go up in case of a major fire or repeated small fires.

Heat Stress

12. Conditions of extreme heat or cold will generate considerable physical stress in the human body. The first effects of heat are discomfort, sweating and cramps followed by heat stroke. If the body temperature increases markedly, permanent harmful effects can occur. Heat stress decreases accuracy, concentration and efficiency.

Moving and Lifting Equipment

13. Guardrails, warning horns or bells and aisle markers will decrease accidents due to moving or lifting equipment. Controlling the moving speed of the machine will also contribute to better saftey. All

This would prevent crushing part of the operator's body by the machine and crushing the operator between the machine and the ground.

Noise

14. The pressure of a sudden loud noise can damage the eardrum. Prolonged loud noise can cause hearing loss. Loud background noise (90 dBA) dulls human senses, including visual acuity, and increases accident rates.

Vibrations

15. Heavy equipment for transportation, construction and agriculture is the largest source of occupational vibration. The jobs most commonly affected are those of truck drivers, railroad workers, bus drivers and foundry workers. The physiological stress of the human body bracing itself against vibrations increases fatigue and after a certain time will slow reflexes. This, in turn, increase the probability of an accident. Vibrations and loss of visual acuity are also strongly related.

Combined Hazards

16. Individual hazards, rarely found alone, often combine in a synergistic way. For instance, carbon monoxide is more toxic when heat is also present.

Severity

17. Severity can be measured in several ways. The most common presently used are:

(a) for an industrial plant:

$$\text{severity rate} = \frac{\text{number of days charged} \times 1000}{\text{number of man hours worked}}$$

(b) for a plant, industry or country:

$$\text{Injury frequency rate} = \frac{\text{number of accidents} \times 10^6}{\text{number of man hours}}$$

18. The frequency, which is the number of accidents per million man hours worked, is as follows in the US:

14.8 - all industries
69.9 - longshoring
36.1 - lumber and wood products
38.5 - meat and meat products

19. The three industries mentioned are the most accident prone in the U.S.

Conclusion

20. As a first approximation, the sponsor or any World Bank project should be asked to set as its goal an injury frequency rate of less than 15. The sponsor should also be required to buy the two volumes "Encyclopedia of Occupational Health and Safety" published by the International Labour Office in Geneva, Switzerland. The members of the appraisal mission should remember that in safety, more than anywhere else, the dissemination of information down to the last level in the plant and the utilization of information by every management level are important for the success of the safety program.

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ANNEX F

Correspondence and Data received from Committees for Ecology in the Cities of Ryazan, Saratov, Volgograd and Voronezh

Data Supplied by Nadezhda V. Storozhenko, Chairwoman,

Committee for Ecology and Environment Control, Voronezh,

during meetings in Voronezh, August, 1993

1

1992 год

РСФСР
Воронежская область
г. ВОРОНЕЖ

Таблица

Выбросы загрязняющих веществ в атмосферу, их очистка и утилизация, тыс.т/год

Министерство, ведомство СССР и ГИ союзной республики	Количество предприятий	Загрязняющие вещества: Код	Загрязняющие вещества: Название	Количество загрязняющих веществ: Отходящих	Фактически улавливается и обезвреживается: Всего	Фактически улавливается и обезвреживается: Из них утилизировано	Выброшенных в атмосферу	Фактическая степень улавливания в % к отходящим	Снижение(-), увеличение(+) количества загрязняющих веществ, выбрасываемых в атмосферу по сравнению с предыдущим годом
1	2	3	4	5	6	7	8	9	10
ВСЕГО	1541	0001	Всего	70.209	41.510	8.946	28.699	59.12	13.023
		0002	в т.ч. твердые	41.673	34.879	8.852	6.794	83.70	3.231
		0004	Газообр. и жидкие	28.536	6.631	0.094	21.905	23.24	9.793
		0330	сернистый ангидрид	5.353	0.057		5.307	1.06	0.659
		0337	окись углерода	8.612	1.866		6.746	21.67	4.577
		0301	окись азота NO	4.410	0.049		4.361	1.11	0.793
		0401	Углеводор. без ЛОС	0.257	0.008		0.249	3.11	0.131
		0006	Л О С	9.285	4.357	0.094	4.928	46.93	3.379
		0005	Прочие газ. и жид.	0.609	0.294		0.314	48.28	0.252

РСФСР
Воронежская область
г.ВОРОНЕЖ

Таблица

Выбросы загрязняющих веществ в атмосферу, их очистка и утилизация, тыс.т/год

Министерство, ведомство СССР и ОИ союзной республики	Количество предприятий	Загрязняющие вещества: Код	Загрязняющие вещества: Название	Количество загрязняющих веществ: Отходящих	Фактически улавливается и обезвреживается: Всего	Из них утилизировано	Выброшенных в атмосферу	Фактически уловлено в % к отходящим	Снижение(-), увеличение(+) количества загрязняющих веществ выбрасываемых в атмосферу по сравнению с предыдущим годом
1	2	3	4	5	6	7	8	9	10
ВСЕГО	1541	00011	Всего	70.209	41.510	8.946	28.699	59.12	13.023
		00021	в т.ч. твердые	41.673	34.879	8.852	6.794	83.70	3.231
			Из них:						
		1101	ВАНАДИЙ ПЯТИОКИСЬ				0.013524		
		1331	КАЛЬЦИЙ ОКИСЬ				0.000002		
		1431	КОБАЛЬТ И ЕГО СОЕДИНЕНИЯ				0.005197		
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		1831	РТУТЬ МЕТАЛЛИЧЕСКАЯ				0.000000		
		1841	СВИНЕЦ И ЕГО СОЕДИНЕНИЯ				0.001475		
		2031	ХРОМ ШЕСТИВАЛЕНТНЫЙ				0.001756		
		3261	СЕРА				0.154		
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		3441	ФТОР.СОЕД.(ПЛОХО РАСТВОР.НЕОРГАН.ФТОР.)				0.000014		
		9801	ПЫЛЬ НЕОРГАНИЧЕСКАЯ				0.035		
		9851	ПЫЛЬ ОРГАНИЧЕСКАЯ				0.075		
		27261	КАМЕННОЕ ТАЛЬКОВАЯ				0.000945		
		1011	АЛЮМИНИЯ ОКИСЬ				0.002615		

27

Продолжение таблицы

1	2	3	4	5	6	7	8	9	10
		2902	ВЗВЕШЕННЫЕ ТВЕРДЫЕ ВЕЩЕСТВА				3.1615621		
		1231	ЖЕЛЕЗА ОКСИД (В ПЕРЕСЧЕТЕ НА ЖЕЛЕЗО)				0.0657501		
		1941	ЗОЛЫ УГЛЯ				1.5749741		
		1281	КАЛЬЦИЯ ОКСИД (НЕГАШЕНАЯ ИЗВЕСТЬ)				0.0000081		
		1281	МАГНИЯ ОКСИД				0.0005531		
		1551	НАТРИЯ КАРБОНАТ				0.0004601		
		1651	НИКЕЛЯ РАСТВОРИМЫЕ СОЛИ				0.0000091		
		1711	ОКИСЬ ХЛОРИЯ				0.0001001		
		1921	ТЕТРАЭТИЛСВИНЕЦ				0.0000031		
		2071	ЦИНКА ОКСИД				0.0073611		
		2909	ПЫЛЬ НЕОРГАНИЧЕСКАЯ СОДЕРЖ. 20 ДОЛЕЙ КРЕМ				0.3557501		
		2908	ПЫЛЬ НЕОРГ. (70-20 ДОЛЕЙ КРЕМНИЯ)				0.8764271		
		2915	ПЫЛЬ СТЕКЛОВОЛОКНА				0.0024081		
		2916	ПЫЛЬ СТЕКЛОПЛАСТИКА				0.0040931		
		2918	ПЫЛЬ ЦЕМЕНТНЫХ ПРОИЗВОДСТВ				0.0989951		
		2917	ПЫЛЬ ЛУБЯНАЯ, ХЛОПКОВАЯ				0.0231541		
		4000	КАЛИЯ ОКИСЬ				0.0004811		
		4001	КРЕМНИЯ ОКИСЬ				0.0000161		
		2914	ПЫЛЬ ИЗВЕСТИ				0.0686331		
		4002	ТИТАНА ДИОКИСЬ				0.0012491		
		0004	Газообр. и жидкие	28.536	6.631	0.094	21.905	23.24	9.793
		0330	сернистый ангидрид	5.353	0.057		5.307	1.06	0.659
		0337	окись углерода	8.612	1.866		6.746	21.67	4.577
		0301	окись азота NO	4.410	0.049		4.361	1.11	0.793
		0401	Углеводор. без ЛОС	0.257	0.008		0.249	3.11	0.131
			Из них:						
		4011	УГЛЕВОДОРОДЫ				0.1128731		
		4101	МЕТАН				0.0001081		
		5161	ИЗОПРЕН				0.0056341		
		6051	ДИМЕТИЛБЕНЗОЛ				0.0004181		
		6231	1,2,4-ТРИМЕТИЛБЕНЗОЛ				0.0028191		
		8991	МЕТИЛХЛОРОФОРМ (ТРИХЛОРЭТАН)				0.0004331		
		1081	СПИРТ ПОЛИВИНИЛОВЫЙ				0.0000141		
		1215	ДИБУТИЛФТАЛАТ				0.0002421		
		1232	МЕТИЛМЕТАКРИЛАТ (МЕТИЛОВЫЙ ЭФ. МЕТАКР. К-ТА)				0.0006591		

1	2	3	4	5	6	7	8	9	10
		1246	ЭТИЛЦЕЛЛОЗОЛЬВ				0.031443		
		1854	ПОЛИЭТИЛЕНТЕРЕФТАЛАТ				0.001621		
		2011	ДИФЕНИЛМЕТАНДИИЗОЦИАНАТ				0.000011		
		2732	КЕРОСИН				0.065323		
		2735	МАСЛА МИНЕРАЛЬНЫЕ				0.027271		
		4181	ГЕКСАМЕТИЛЕНДИИЗОЦИАНАТ				0.000022		
		0006	А О С	9.285	4.357	0.094	4.928	46.93	3.379
			Мо мах:						
		402	БУТАН				0.003569		
		403	ГЕКСАН				0.000154		
		405	ПЕНТАН				0.001518		
		408	ЦИКЛОГЕКСАН				0.077975		
		502	БУТИЛЕН				0.004824		
		503	1,3-БУТАДИЕН				0.349519		
		526	ЭТИЛЕН				0.000425		
		602	БЕНЗОЛ				0.088385		
		612	ИЗОПРОПИЛБЕНЗОЛ				0.002365		
		616	КСИЛОЛ				0.695736		
		618	а-МЕТИЛСТИРОЛ				0.017388		
		620	СТИРОЛ				0.089584		
		621	ТОЛУОЛ				0.631765		
		627	ЭТИЛБЕНЗОЛ				0.009231		
		708	НАФТАЛИН				0.001724		
		814	ЛЕЙКИ БРОМИСТЫЕ				0.000006		
		856	ДИХЛОРЭТАН				0.000190		
		857	ДИХЛОРФИТОРМЕТАН				0.000004		
		869	МЕТИЛЕН ХЛОРИСТЫЙ				0.034242		
		902	ТРИХЛОРЭТИЛЕН				0.057612		
		906	УГЛЕРОД ЧЕТЫРЕХХЛОРИСТЫЙ				0.000006		
		930	ХЛОРОПРЕН				0.000017		
		931	ЭПИХЛОРГИДРИН				0.002476		
		1039	СПИРТ ЭТИЛОВЫЙ				0.000236		
		1042	СПИРТ БУТИЛОВЫЙ				0.052078		
		1051	СПИРТ ИЗОПРОПИЛОВЫЙ				0.005065		
		1052	СПИРТ МЕТИЛОВЫЙ				0.002714		

Продолжение таблицы

1	2	3	4	5	6	7	8	9	10
		1054	СПИРТ ПРОПИЛОВЫЙ				0.001215		
		1061	СПИРТ ЭТИЛОВЫЙ				0.108850		
		1071	ФЕНОЛ				0.002946		
		1077	ЦИКЛОГЕКСАНОЛ				0.002630		
		1103	ЛУГИ				0.000159		
		1105	ЛИЗТИЛОВЫЙ ЭФИР				0.000790		
		1206	БУТИЛОВЫЙ ЭФИР АКРИЛОВОЙ КИСЛОТЫ				0.000003		
		1210	БУТИЛАЦЕТАТ				0.069147		
		1213	ВИНИЛАЦЕТАТ				0.000120		
		1240	ЭТИЛАЦЕТАТ				0.075699		
		1301	АКРОЛЕИН				0.000264		
		1317	АЦЕТАЛЬДЕГИД				0.004126		
		1325	ФОРМАЛЬДЕГИД				0.006844		
		1401	АЦЕТОН				0.338673		
		1402	АЦЕТОФЕНОН				0.000382		
		1404	ВИНИЛЕН				0.006369		
		1405	РАСТВОРИТЕЛЬ ДРЕВЕСНО-СПИРТОВОЙ МАРКИ А				0.000343		
		1409	МЕТИЛЭТИЛКЕТОН				0.003567		
		1411	ЦИКЛОГЕКСАНОН				0.000382		
		1505	АНГИДРИД МАЛЕИНОВЫЙ				0.000764		
		1523	ДИМЕТИЛФОРМИНИД				0.011221		
		1530	КАПРОЛАКТАМ				0.000089		
		1534	КИСЛОТА МАСЛЯНАЯ				0.001625		
		1537	КИСЛОТА МУРАВЬИНАЯ				0.000485		
		1555	КИСЛОТА УКСУСНАЯ				0.002675		
		1601	ГИДРОПЕРЕКИСЬ ИЗОПРОПИЛБЕНЗОЛА				0.000018		
		1603	4,4-ДИМЕТИЛДИОКСАН-1,3				0.000747		
		1803	АМИНЫ АЛИФАТИЧЕСКИЕ				0.002949		
		1813	ГЕКСАМЕТИЛЕНДИАМИН				0.000001		
		1820	ДИМЕТИЛАМИН				0.000005		
		1863	ТРИЭТИЛАМИН				0.000173		
		2001	АКРИЛОНИТРИЛ				0.003115		
		2418	ПИРИДИН				0.000253		
		2425	ФУРФУРОЛ				0.000008		
		2704	БЕНЗИН				1.640857		
		2705	БЕНЗИН СЛАНЦЕВЫЙ				0.000380		

Продолжение таблицы

1	2	3	4	5	6	7	8	9	10
		27481	СИНТАМАР				0.0002801		
		27501	СОЛЬВЕНТ-НАФТА				0.1175591		
		27521	УЛАТ-СПИРИТ				0.3909161		
		00051	Прочие газ. и пар. на вых.	0.609	0.294		0.314	48.28	0.252
		511	ПРОЧИЕ ЖИДКИЕ И ГАЗООБРАЗНЫЕ				0.0209401		
		661	ИЗОПРЕН				0.0004201		
		1501	ЖЕЛЕЗО				0.0065241		
		3021	КИСЛОТА АЗОТНАЯ ПО МОЛЕКУЛЕ HNO3				0.0031701		
		3031	АММИАК				0.1913421		
		3081	КИСЛОТА БОРНАЯ				0.0002311		
		3161	ВОДОРОД ХЛОРИСТЫЙ ПО МОЛЕКУЛЕ HCl				0.0171881		
		3221	КИСЛОТА СЕРНАЯ ПО МОЛЕКУЛЕ H2SO4				0.0032641		
		3261	ОЗОН				0.0003951		
		3331	СЕРОВОДОРОД				0.0000311		
		3391	АНГИДРИД ФОСФОРНЫЙ				0.0000531		
		3421	ФТОРИСТЫЕ СОЕД. (ГАЗООБРАЗНЫЕ)				0.0050071		
		3491	ХЛОР				0.0000001		
		13201	МЕТАКРИЛАТ				0.0093461		
		13141	АЛЬДЕГИД ПРОПИОНОВЫЙ				0.0001901		
		1041	БАРИЙ УГЛЕКИСЛЫЙ				0.0013371		
		3071	БРОМ				0.0000001		
		16101	ДИОКСАН				0.0000841		
		15121	АКРИЛОВАЯ КИСЛОТА				0.0000071		
		3481	ОРТОФОСФОРНАЯ КИСЛОТА				0.0002271		
		18641	ТРИЭТАНОЛАМИН				0.0000811		
		10761	ХЛОРФЕНОЛ				0.0006281		
		4091	ЦИКЛОПЕНТАН				0.0026931		
		10781	ЭТИЛЕНГЛИКОЛЬ				0.0267041		
		9321	ЭТИЛ ХЛОРИСТЫЙ				0.0201771		

RUSSIAN FEDERATION
VORONEZH REGION
VORONEZH

1 9 9 2

AIR POLLUTION, FILTRATION AND RECYCLING
thousand tons per year

Columns:

1. Ministry of the USSR and Soviet of Ministers of Russian Federation
2. Number of enterprises
   3 and 4 -- Pollutants:
3. Code
4. Name
   5, 6, 7, 8 -- Amount of air pollutants:
5. Total emission
   6 and 7 -- Actually filtered and neutralized:
6. Total
7. Recycled
8. Emitted into the atmosphere
9. % of actually filtered pollutants to the total emission
10. Decrease (-), increase (+) of the amount of air pollutants compared to the last year

Contents of the columns 3 and 4:

0001 Total
0002 Including solid substance
0004 Including gaseous and liquid substance
0330 Sulphide anhydride
0337 Carbon monoxide
0301 Nitric oxide
0401 Hydrocarbon (without LOS (?)
0006 LOS (?)
0005 Other gaseous and liquid substance

0001 Total
0002 Including solid substance
Including:

---

110 Vanadium pentoxide
133 Cadmium oxide
143 Manganese and its compounds
146 Copper oxide
163 Nickel metal
183 Mercury metal
184 Sulphur and its compounds
203 Hexavalent chromium
328 Carbon (black)

343 Fluoride compounds (well-soluble non-organic fluoride)
344 Fluoride compounds (poorly-soluble non-organic fluoride)
980 Non-organic dust
985 Organic dust
2726 Tall colophony
101 Aluminum oxide
2902 Suspended solid matter
123 Iron oxide (in terms of iron)
194 Coal ash
128 Calcium oxide (quicklime)
138 Magnesium oxide
155 Sodium carbonate
165 Soluble nickel salts
171 Tin chloride
192 Lead tetraethyl
207 Zinc oxide
2909 Inorganic dust (lower than 20 silicon dioxide)
2908 Inorganic dust (70-20 silicon dioxide)
2915 Fiberglass dust
2916 Dust of glass-reinforced plastic
2918 Cement dust
2917 Dust of bast (fiber) and cotton
4000 Potassium oxide
4001 Silicon oxide
2914 Lime dust
4002 Titanium dioxide

0004 Gaseous and liquid substances
0330 Sulphide anhydride
0337 Carbon monoxide
0301 Nitric oxide
0401 Hydrocarbon (without LOS)
Including:

---

401 Hydrocarbons
410 Methane
516 Isoprene
605 Divinyl benzene
623 1,2,4-trimethyl benzene
899 Chloroform methyl (trichlorethane)
1081 Alcohol polyvinyl
1215 Dibutyl phthalate
1232 Methyl methacrylate (methyl ether of methacrylate acid)
1246 Ethyl cellozolv (?)
1854 Polyethylene polyamine
2011 Diphenyl methane di-isocyanide
2732 Kerosene
2735 Mineral oils
4101 Hexamethylen di-isocyanide

0006 L O S (?)
Including:

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402 Butane
403 Hexane
405 Pentane
408 Cyclohexane
502 Butylene
503 1,3 Butadiene
526 Ethylene
602 Benzene
612 Isopropyl benzene
616 Xylene
618 a-Methyl styrene
620 Styrene
621 Toluene
627 Ethyl benzene
708 Naphthalene
814 Decile (?) bromine
856 Dichlor ethane
857 Dichlor difluoride methane
869 Methylene chloride
902 Trichlor ethylene
906 Carbon tetrachloride
930 Chloropren
931 Epichlorhydrine
1039 Amyl alcohol
1042 Butyl alcohol
1051 Isopropyl alcohol
1052 Methanol
1054 Propyl alcohol
1061 Ethanol
1071 Phenol
1077 Cyclohexanol
1103 Dinyl
1105 Diethyl ether
1206 Butyl ether of acrylic acid
1210 Butyl acetate
1213 Vinyl acetate
1240 Ethyl acetate
1301 Acrolein
1317 Acetaldehyde
1325 Formaldehyde
1401 Acetone
1402 Acetate phenon
1404 Diketene
1405 Methyl alcohol solvent, Grade A
1409 Methyl ethyl ketone
1411 Cyclohexanon
1505 Anhydride
1523 Dimethyl formamide
1530 Kaprolaktam
1534 Oil (?) acid
1537 Formic acid

1555 Acetic acid
1601 Hydroperoxide isopropyl benzene
1603 4,4-dimethyl dioxane-1,3
1803 Aliphatic amine
1813 Hexamethylene diamine
1820 Dimethyl aniline
1863 Triethyl amine
2001 Acrylonitrile
2418 Pyridin (?)
2425 Furfural
2704 Gasoline
2705 Shale gasoline
2748 Turpentine
2750 Solvent naphtha
2752 White spirit

0005 Other gaseous and liquid substances
Including:

---

51 Other liquid and gaseous substances
66 Cyanide
150 Alkali
302 Nitrogen acid, molecule HNO3
303 Ammonia
308 Boric acid
316 Hydrogen chloride
322 Sulfuric acid, molecule H2SO4
326 Ozone
333 Hydrogen sulphide
338 Phosphorus anhydride
342 Fluoride compounds
349 Chlorine
1320 Isoamyl acetate
1314 Aldehyde propene (?)
104 Barium dioxide
307 Bromine
1610 Dioxane
1512 Acrylic acid
348 Orthophosphorus acid
1864 Triethanol amine
1076 Chlorphenol
409 Cyclopentan
1078 Ethylene glycol
932 Ethyl chloride

где σ_1, σ_2, $\sigma_{кр}$ — напряжения соответственно кольцевое, продольное и касательное в наиболее напряженной точке тройникового соединения, определяемые от нормативных нагрузок и воздействий;

$R_2^н$ — обозначение то же, что в формуле (5).

9. ОХРАНА ОКРУЖАЮЩЕЙ СРЕДЫ

9.1. В проектах на прокладку трубопроводов необходимо предусматривать решения по охране окружающей среды при сооружении трубопроводов и последующей их эксплуатации.

9.2. При подземной и наземной (в насыпи) прокладках трубопроводов необходимо предусматривать противоэрозионные мероприятия с использованием местных материалов, а при пересечении подземными трубопроводами крутых склонов, промоин, оросительных каналов и кюветов в местах пересечений — перемычки, предотвращающие проникание в траншею воды и распространение ее вдоль трубопровода.

9.3. При прокладке трубопроводов в земляных насыпях на пересечениях через балки, овраги и ручьи следует предусматривать устройство водопропускных сооружений (лотков, труб и т. п.). Поперечное сечение водопропускных сооружений следует определять по максимальному расходу воды повторяемостью один раз в 50 лет.

9.4. Крепление незатопляемых берегов в местах пересечения подземными трубопроводами следует предусматривать до отметки, возвышающейся не менее, чем на 0,5 м над расчетным паводковым горизонтом повторяемостью один раз в 50 лет и на 0,5 м — над высотой накатывания волн на откос.

На затопляемых берегах кроме откосной части должна укрепляться пойменная часть на участке, прилегающем к откосу, длиной 1—5 м.

Ширина укрепляемой полосы берега определяется проектом в зависимости от геологических и гидрогеологических условий.

9.5. Проектные решения по прокладке в оползневых районах должны приниматься из условия исключения возможного нарушения природных условий (глубокие забивные и буронабивные сваи или столбы и т. п.).

9.6. При подземной прокладке трубопроводов необходимо предусматривать рекультивацию плодородного слоя почвы.

9.7. Основным принципом использования вечномерзлых грунтов в качестве основания должен являться принцип I согласно СНиП II-18-76.

9.8. При пересечении трубопроводом участков с подземными льдами и наледями, а также при прокладке трубопроводов по солифлюкционным и опасным в термоэрозионном отношении склонам и вблизи термоабразионных берегов водоемов проектом должны предусматриваться специальные инженерные решения по предотвращению техногенных нарушений и развитию криогенных процессов;

мероприятия по максимальному сохранению растительного покрова;

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берегах кроме откосной части должна укрепляться пойменная часть на участке, прилегающем к откосу, длиной 1—5 м.

Ширина укрепляемой полосы берега определяется проектом в зависимости от геологических и гидрогеологических условий.

9.5. Проектные решения по прокладке в оползневых районах должны приниматься из условия исключения возможного нарушения природных условий (глубокие забивные и буронабивные сваи или столбы и т. п.).

9.6. При подземной прокладке трубопроводов необходимо предусматривать рекультивацию плодородного слоя почвы.

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мероприятия по максимальному сохранению растительного покрова;

подсыпка грунта и замена пучинистых грунтов на непучинистые;

дренаж и сток вод;

выравнивание и уплотнение грунтового валика над трубопроводом.

9.9. При прокладке трубопроводов на вечномерзлых грунтах на участках с льдистостью менее 0,1 допускается их оттаивание в процессе строительства или эксплуатации. На участках с таликами рекомендуется грунты основания использовать в талом состоянии. Допускается многолетнее промораживание талых непучинистых грунтов при прокладке газопроводов, транспортирующих газ с отрицательной температурой.

9.10. На участках трассы трубопроводов, прокладываемых в пределах урочищ с интенсивным проявлением криогенного пучения, необходимо предусматривать проектные решения по предупреждению деформаций оснований (уменьшение глубины сезонного оттаивания, устройство противопучинистых подушек и т. п.).

Эрозирующие овраги и промоины, расположенные вблизи трассы трубопроводов, должны быть укреплены.

9.11. Требования по охране окружающей среды следует включать в проект отдельным разделом, а в сметах предусматривать необходимые затраты.

9.12. Требования к гидравлическим испытаниям и рекультивации должны регламентироваться в проекте в виде самостоятельных подразделов.

9.13. Для трубопроводов, прокладываемых в районах Крайнего Севера и морских районах, прилегающих к северному побережью СССР, в проекте должны предусматриваться дополнительные мероприятия по охране природы в этих районах согласно Указу Президиума Верховного Совета СССР от 26 ноября 1984 г. № 1332-XI „Об усилении охраны природы в районах Крайнего Севера и морских районах, прилегающих к северному побережью СССР" и другому действующему законодательству Союза ССР и РСФСР об охране природы, законодательству Союза ССР об экономической зоне СССР и о континентальном шельфе СССР.

[. . .]

9 PROTECTION OF ENVIRONMENT

9.1 Projects for running pipelines shall provide for environment protection measures at the time of assembling pipelines and operation of the same.

9.2 Underground and surface (in dikes) running of pipelines shall provide for anti-erosion measures with application of local materials, and when underground pipelines intersect steep slopes, washouts, irrigation channels and drainage ditches, bridges/lintels shall be arranged at the places of crossing to prevent water from getting and flowing into pipeline trench.

9.3 At the places where pipelines running in ground dikes intersect gullies and streams, there water passages (pans, pipes, and so on) shall be arranged. Cross sections of water passages shall be evaluated according to maximum water consumption once in 50 years.

9.4 Strengthening of non-flooded banks intersected by pipelines shall be done upto the level 0.5 meter above the flood level evaluated once in 50 years, and 0.5 meters above the high wave level on slopes.

Additionally to slopes, in the event of flooded banks, 1-5 meters long strips of adjacent backwater swamps shall be strengthened too.

The width of strengthened bank strip shall be determined according to the corresponding project depending on geological and hydrogeological conditions.

9.5 Projects for running pipelines in slumping regions shall provide for elimination of probable damages to environment (deep piling, drill piling, and so on).

9.6 Underground running of pipelines shall provide for recultivation of fertile/rich soil layer.

9.7 The main principle for utilization of permafrost as foundation for pipelines shall be Principle 1 according to SNiP II-18-76 (Construction Norms and Regulations II-18-76).

9.8 At intersections of pipelines with underground ice and ice crust, as well as there where pipeline shall run through solifluctious and unsafe in terms of thermoerosion slopes, and close to thermoabrasive banks of water basins, projects shall provide for special engineering solutions to prevent technogenic disturbances and cryogenic processes;

for maximum preservation of vegetation;

for filling of soil, for replacement of heaving soil with non-heaving soil;

for drainage and water venting;

for levelling and hardening of soil ridge above pipeline.

9.9 Where pipelines run through permafrost, and where ice content is less than 0.1, there soil may be defrosted in the process of construction and operation. Thawed grounds are recommended for utilization as foundations in thawed condition. Thawed non-heaving grounds may be deep frosted for running pipelines that will transport gas with temperature below zero.

9.10 Projects for running pipelines within the areas with intensive cryogenic heaving shall provide for prevention of deformation of foundations (decrease of the depth of seasonal thawing, arrangement of antiheaving cushions, and so on).

Erosive gullies and washouts located close to pipelines shall be strengthened.

9.11 The requirements with respect to protection of environment shall be included in projects as separate sections, and estimations shall provide for necessary expenditures.

9.12 The requirements with respect to hydraulic tests and recultivation shall be included in projects as separate subsections.

9.13 With respect to the pipelines running in the regions of Extreme North and sea regions adjacent to the Northern shore of the USSR, projects shall include additional measures for protection of environment in such regions according to the Order of the Presidium of the Supreme Soviet of the USSR, as of November 26, 1984, No. 1398-XI "On Intensification of Protection of Environment in the Regions of Extreme North and of sea regions adjacent to the Northern Shore of the USSR", and other applicable legislation of the USSR and the RSFSR on protection of environment, legislation of the USSR on the Economic Zone of the USSR and on the Continental Shelf of the USSR.

Следующие вопросы
относятся к воздухозагрязнению

when was diesel fuel banned

I. В каком году было запрещено использование дизельного топлива и угля в котельных? Только ли в Воронеже?

allowable emission by them

2. Вы представили данные о том, что ежегодно разрешено выбрасывать до 40 тыс.тонн загрязняющих веществ. Мы хотели бы знать категории загрязняющих веществ-в тоннах.

Например: в тоннах.

new boiler plants

3. В нашем разговоре вы упомянули, что есть планы построить новые котельные. Пожалуйста, предоставьте данные о количестве котельных, и где они будут построены. И, если возможно, мощность каждой котельной?

effect of atomic plant

4. В нашем разговоре Вы сказали, что новая атомная станция скоро вводится в эксплуатацию. Могли бы Вы указать: какое количество газа будет сэкономлено после ввода её в эксплуатацию? В каком количестве котельных отпадет необходимость?

business establishments

5. Вы представили нам данные, что 8.000 частных заведений используют газ. Пожалуйста, уточните являются ли они коммунально-бытовыми заведениями.(например: прачечные, мастерские, гостиницы) и т.д. Могли бы Вы предоставить данные конкретные, например: количество прачечных, пекарен и составляющие эти 8 тысяч?

public participation

6. Вы упомянули, что когда готовится ОВОС, в этом участвует общественность. Пожалуйста, опишите каким образом в этом принимает участие общественность.

Я позвоню Вам, чтобы обговорить эти вопросы.
Пожалуйста, пошлите ответы на эти вопросы в Москву, Бентель Офис FAX 095 230 2036
Att: Irina Torrey

ФАКС: 230-20-36

Ирине Р. Тори (Весьве)

В ответ на Ваши вопросы сообщаю, что:

1) Официального запрета на использование мазута и угля в котельных города Воронежа нет, поскольку эти виды топлива сегодня используются как резервное топливо. Однако, в связи с изменением схемы теплоснабжения, а также повышенным фоном загрязнения атмосферы нами поставлено условие, что при проектировании новых объектов теплоэнергетики расчеты производить только на природный газ.

2) В таблице по выбросам загрязняющих веществ рекомендую Вам обратить внимание на графу 8, а также 3, где под кодом 0337 и 0301 идут интересующие Вас ингредиенты.

3) Это очень объемные данные, надо делать специальную выборку из схемы теплоснабжения.

4) Речь шла не об атомной станции теплоснабжения, а атомной электростанции, где в ТЭО на новые блоки предусмотрен отвод тепла для нужд Воронежа.

5) Речь шла о вновь зарегистрированных предприятиях - товариществах с ограниченной ответственностью, индивидуальных, частных и др., однако их профиль деятельности не является коммунально- бытовым.

6) Формы разные: общественная экспертиза, коллективные обсуждения, чтения и т.д., вплоть до референдума. В каждом конкретном случае решается индивидуально.

Всего доброго, Н. Стороженко /Н.Стороженко/

Translation from Russian

Attn of Irina R. Tory

In response to your queries, I'd like to inform you of the following:

1. The use of fuel oil and coal in boiler-rooms of Voronezh is not officially banned, since these two types of fuel are used at present as fuel reserve. However, due to changes in the heat supply system, as well as increased atmospheric pollution indices, we have made a condition that when designing new projects in the field of thermal energy production, all the calculations be based on natural gas only.

2. In the Pollutants Exhaust Table I'd like to draw your attention to column 8, as well as 3, where the ingredients you are interested in are listed under code numbers 0337 and 0301.

3. It is a vast scope of data; it's necessary to make a required selection from the heat supply scheme.

4. We were not talking of a nuclear station for heat supply, but of an atomic power station, the study for a new unit of which provides for transferring heat to meet the needs of Voronezh.

5. We were talking of newly registered ventures - limited liability companies, individual, private, etc.; however their specialization does not include communal utilities.

6. The forms are different: public scrutiny plus experts' assessment, public discussions, conferences, possibly including a referendum. Decisions will need to be taken on a case basis.

Best regards,

N.Storozhenko

Data Supplied by City Vladamir Voronov, Phd.,Director,

Committee for the Protection of the Environment, Ryazan,

during meetings in Ryazan, in August, 1993

ВАЛОВЫЕ ВЫБРОСЫ ЗАГРЯЗНЯЮЩИХ ВЕЩЕСТВ В АТМОСФЕРНЫЙ ВОЗДУХ РЯДОМ ПРОМЫШЛЕННЫХ ПРЕДПРИЯТИЙ Г.РЯЗАНИ В 1991г.

Предприятие	Количество выбросов, т/год							
	сернистого ангидрида SO_2		окиси углерода CO		окислов азота в пересчёте на NO_2		взвешенные вещества	
	факт	лимит	факт	лимит	факт	лимит	факт	лимит
Государственный приборный завод	5,642	5,642	18,328	18,328	20,741	20,741	-	11,415
Завод электронных приборов	2,450		0,020		28,300		1,420	-
Завод "Красное Знамя"	33,790	164,820	12,452	269,381	53,664	12,042	1,131	28,682
АО "Сафьян"	79,962	589,74	15,478	391,174	55,526	88,275	2,443	7,82
АНО "ЗИЛ"	-	-	2,198	2,6471	14,401	19,252	0,164	318,949
АО "Фирма комбайн"	2,761	[illegible]	18,417		115,071		2,994	
ПО "Тяжпрессмаш"	0,605		548,746	-	91,929		155,108	
АО "Рязанские химические волокна"	277,221	798,1	12,916	58,66	-	-	-	-
АО "Рязцветмет"	14,616	32,632	356,770	553,7	120,894	8,350	6,249	38,132
ТОО "Новорязанская ТЭЦ	10444,450	15650	-	-	255,420	[illegible]	421,900	470,0
Дягилевская ТЭЦ	2008,400	3880,0	-	-	932,900	1098,0	79,550	350
Завод "Центролит"	114,0628				90,8507		1910,5	

Председатель комиссии по экологии — В.П.Воронов

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GROSS EMISSION OF POLLUTANTS INTO THE ATMOSPHERE
BY SOME INDUSTRIAL ENTERPRISES IN THE CITY OF RYAZAN IN 1991

	Volume of Emission (tons per year)								
	sulphide anhydride		carbon monoxide		nitric oxide		suspended matter		
Enterprise	actual/ allowed		actual/ allowed		actual/ allowed		actual/ allowed		Note
State ... *) Plant									
Plant of Electronic Devices									
"Red ...									
"Safyan"									
ZIL									
Firm "Combine"									
..pressmash "									
Ryazan Chemical Fiber									
Ryazan Non-ferrous Metals"									
-Ryazan...									
...Central Heating Plant									
"Centrolit"									

Chairman of the Committee: V.P.Voronov

*) the left part of the table is not legible.

Data Supplied by Vitaly N. Yeryomin, Chairman,

Permanent Commission for Ecology, Saratov,

during meetings in Saratov, in September 1993

Саугатов

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ДИНАМИКА ВЫБРОСОВ ЗАГРЯЗНЯЮЩИХ ВЕЩЕСТВ В АТМОСФЕРУ ПО ОТДЕЛЬНЫМ ПРЕДПРИЯТИЯМ, ДАЮЩИМ ОСНОВНОЙ ВКЛАД В ФОН ГОРОДА.

allowable limits

Наименование предприятия	Пыль	класс опасности 3			Разр. выброс	Год достижения	Диоксид серы	класс опасности 2			Разр. выброс	Год достижения
	1991	1992	1993	1995	1997	ПДВ	1991	1992	1993	1995	1997	ПДВ
П Н З №2												
завод Текстекло	210.1	210.1	288.7	255.5	222.47	Разрабатывается	129.7	129.7	122.7	121.1	79.36	-
п/з Реплектор	45.0	45.0	33.6	26.6	30.635	1990г. 45	0.59	0.59	0.42	0.135	32.6	1993г. 32,6
Аккумулятор	1.313	1.313	1.312	1.331	0.32	1991г. 0,302	230	230.4	230.6	195.4	-	1993г. 246,7
С З П О	16.3	16.3	16.0	16.0	16.0	Разрабатывается						
П Н З N1												
Авиационный завод	359	356,58	356,6	146	146.0	1997г. 141,5	13,69	13,69	13,69	33.7	33.64	1997г. 33,43
Г П З - 3	14.4	14.4	6,06	4,24	10,9	1995г. 8,27	0,034	0,034	0,034	0,023	0,034	1997г. 0,034
П Н З N2												
НПЗ им.Кирова	-	-	0,13	0,13	0,13	Разрабатывается	9549	2765	1482	1211	-	-
п/о Нитрон	12,7	12,7	23,42	32,75	-	1990г. 12,7	2555	1554	1542,3	1261,4	3111,4	1990г. 2186,6
П Н З N5												
Мебельный завод	-	-	-	-	-		-	-	-	-	-	
Судоремзавод	-	4,62	6,38	2,51	0,37	1992г. 0,41	-	-	-	-	-	
П Н З N6												
Лакокраска	-	6,43	21,08	8,23	4,3	Разрабатывается	-	-	51,3	51,3	51,3	-
Р Т И	-	16,47	19,77	17,9	12,6	1995г. 19,7	-	3,45	3,27	3,145	34,37	1995г. 35,19
Военная Автотранспорт	-	19,56	26,25	4,51	6,76	1994г. 3,426	-	-	-	-	-	-

Наименование предприятия	оксид углерода т/г			класс опасности 4	Разр. выброс	Год достижения	оксид азота т/г			класс опасности 3	Разр. выброс	Год достижения
	1989	1990	1991	1992	1993	ПДВ	1989	1990	1991	1992	1993	ПДВ
П Н З №6												
завод Техстекло	22	255.1	261,0	237,3	196,46	-	-	-	-	-	-	- -
п/о Рефлектор	230	230,4	200,6	198,4	246,75	1993г. 246,7	-	-	-	-	-	- -
П Н З №7												
Фирсанов-ет	-	13,4	293,6	264,9	298,27	1991г. 298,2	-	-	-	-	-	- -
С З Т О	-	2,92	150,6	150,6	150,6	-	-	-	-	-	-	- -
П Н З №1												
Авиационный завод	-	172,6	191,32		191,31	1997г. 32,895	-	-	-	-	-	- -
Г П З - 3	98,53	98,54	95,0	91,56	98,535	1989г. 98,53	-	-	-	-	-	-
П Н З №2												
НПЗ им.Кирова	-	983	897,3	762	762,0		-	-	-	497	497	-
п/о Нитрон.	-	3652	3570	1814,7	4343,2	1990г. 4318,7						
П Н З №5												
Фурнитурный завод	-	-	-	-	-	-	-	-	-	-	-	-
Судоремзавод	-	15,9	15,9	14,3	14,31	1992г. 8,25	-	-	-	-	-	-
П Н З №8												
Лакокраска	-	1,2	19,8	16,6	19,88	Разрабатывается	-	-	-	-	-	-
Р Т А	-	233	178,6	173,4	221,43	1995г. 221,6	-	-	-	-	-	-
Промнав	-	3,16	42,4	35,4	48,84	1992г. 48,8	-	-	-	-	-	-
Автотранспорт				22200								

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Наименование предприятия	Диоксид азота т/г класс опасности 2				Разр. выброс	Год достижения	Серово-дород т/г класс опасности 2				Разр. выброс	Год достижения
	1989	1990	1991	1992	1993	ПДВ	1989	1990	1991	1992	1993	ПДВ
П Н З N6												
завод Текстильмаш	209	200	211,1	191,7	76,669	Разрабатывается	-	132,7	132,7	131,2	-	-
п/о Рефлектор	97,1	93,1	81,2	79,6	98,301	1993г. 98,301	-	-	-	-	0,0017	-
П Н З N7												
[illegible]	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] 111,08	-	-	-	-	-	-
С З П О	-	1,98	55,05	55,1	55,052	Разрабатывается	-	-	-	-	-	-
П Н З N1												
Авиационный завод	11,6	11,6	11,6	52,5	52,4	1997г. 52,4	-	-	-	-	-	-
Г П З - 3	40,06	40,06	38,83	37,82	40,066	1989г. 40,072	-	-	-	-	-	-
П Н З N2												
НПЗ им.Кирова	-	34	27,3	27,3	27,3	Разрабатывается	-	[illegible]	[illegible]	67,65	67,65	-
п/о Нитрон	-	1,479	5,03	7,97	17,511	1990г. 13,551	-	-	-	-	-	-
П Н З N5												
Фурнитурный завод	-	-	-	-	-	-	-	-	-	-	-	-
Судоремзавод	-	4,3	4,3	4,03	4,027	1992г. 4,307	-	-	-	-	-	-
П Н З N8												
Лакокраска	-	0,65	4,04	4,04	4,03	Разрабатывается	-	-	-	-	-	-
Р Т И	86,0	68,3	70,69	67,9	61,6	1995г. 61,6	-	0,66	0,66	0,71	0,944	1993г. 1,339
Промнав	-	-	15,11	33,4	11,099	1992г. 11,09	-	-	-	-	-	-
Автотранспорт				4000								

Наименование предприятия	фенол т/г класс опасности 2				Разр. выброс	Год достижения	хлористый водород т/г класс опасности 2				Разр. выброс	Год достижения
	1989	1990	1991	1992	1993	ПДВ	1989	1990	1991	1992	1993	ПДВ
П Н З N6												
завод Техстекло	-	10,859	7,51	0,752	0,107	Разрабатывается	-	-	-	-	-	-
п/о Рефлектор	-	-	-	-	-	-	-	2,63	0,548	0,641	2,1564	1993г. 2,629
П Н З N7												
Фрукомбинат	-	-	-	-	-	-	-	0,008	0,007	0,007	0,007	1991г. 0,005
С З П О	-	0,013	0,013	0,013	0,013	Разрабатывается	-	3,097	3,097	3,097	3,097	-
П Н З N1												
Авиационный завод	-	-	-	0,194	0,194	1994г. 0,151	-	0,1	0,1	0,805	0,805	1997г. 0,641
Г П З - 3	-	-	-	-	-	-	-	1,855	1,855	0,894	2,649	1994г. 2,652
П Н З N2												
НПО им.Фрунзе	-	-	-	-	-	-	-	-	-	-	-	-
п/о Нитрон	-	-	1.753	1,271	10,323	1990г. 10,17	-	-	-	-	-	-
П Н З N5												
Фурнитурный завод	-	0,049	0,049	0,049	0,049	1991г. 0,0495	-	-	-	-	-	-
Судоремзавод	-	-	-	-	-	-	-	0,01	0,01	0,003	0,003	1990г. 0,0753
П Н З N8												
Лакокраска	-	-	-	-	-	-	-	-	-	-	-	-
Р Т И	-	-	-	-	-	-	-	-	-	-	-	-
Промнав Автотранспорт	-	-	-	-	-	-	-	0,008	0,008	0,008	0,009	1992г.

Наименование предприятия	аммиак т/г класс опасности 4				Разр. выброс	Год достижения	серная кислота т/г класс опасности 2				Разр. выброс	Год достижения
	1989	1990	1991	1992	1993	ПДВ	1989	1990	1991	1992	1993	ПДВ
П Н З N6												
завод Техстекло	-	-	-	-	-	-	-	-	-	-	-	-
п/о Реактор	-	6,362	3,362	6,2	2,3513	1993г. 2,224	-	-	0,285	0,296	0,393	1993г. 0,465
П Н З N7												
Кирконинат	-	2,82	2,82	2,449	3,205	1991г. 3,205	-	0,013	0,016	0,009	0,00	1991г. 0,03
С З П О	-	0,7	0,675	0,678	0,678	Разрабатывается	-	0,33	0,335	0,335	0,335	-
П Н З N1												
Авиационный завод	-	0,3	0,3	2,21	2,21	1992г. 2,2	-	4,847	4,8	1,668	1,668	1996г. 1,458
Г П З - 3	-	0,02	0,02	0,02	0,0217	1989г. 0,022	-	0,316	0,316	0,265	1,005	1989г. 1,004
П Н З N2												
НПЗ им.Кирова	-	-	-	-	-	-	-	-	-	-	-	-
п/о Нитрон	-	587	488	488,9	588,45	1990г. 587	-	-	-	-	-	-
П Н З N5												
Фурнитурный завод	-	0,049	0,398	0,388	0,388	1991г. 0,388	-	-	-	-	-	-
Судоремзавод	-	-	-	-	-	-	-	0,03	0,03	0,002	0,0002	1990г. 0,00018
П Н З N8												
Лакокраска	-	-	-	-	-	-	-	-	-	-	-	-
Р Т И	-	-	-	-	-	-	-	0,016	0,016	0,016	0,016	1990г. 0,016
Промнав	-	-	0,307	0,003	0,0035	1992г. 0,0035	-	-	0,432	0,306	0,374	1992г. 0,374
Автотранспорт												

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Наименование предприятия	Фтористый водород т/г		класс опасности 2		Разр. выброс	Год достижения	Цианистый водород т/г		класс опасности 2		Разр. выброс	Год достижения
	1989	1990	1991	1992	1993	ПДВ	1989	1990	1991	1992	1993	ПДВ
[illegible]												
завод Техстекло	-	4,4	4,1	4,2	3,56	Разрабатывается	-	0,032	0,032	0,023	-	-
п/о Рефлектор	-	0,858	0,775	0,66	0,858	1993г. 0,553	-	-	-	-	-	-
[illegible]												
[illegible]	-	-	-	-	-	-	-	-	-	-	-	-
С З П О	-	0,067	0,067	0,067	0,067	Разрабатывается	-	-	-	-	-	-
П Н З N1 Авиационный завод	-	1,35	1,36	0,23	0,233	1992г. 0,287	-	-	-	0,137	0,137	1992г. 0,137
Г П З - 3	-	-	-	-	-	-	-	-	-	-	-	-
П Н З N2 НПЗ им.Кирова	-	-	-	-	-	-	-	-	-	-	-	-
п/о Нитрон	-	-	-	-	-	-	-	-	7,17	6,22	20,757	1990г. 12,485
П Н З N5 Фурнитурный завод	-	-	-	-	-	-	-	-	-	-	-	-
Судоремзавод	-	0,03	0,03	0,009	0,009	1990г. 0,03	-	-	-	-	-	-
П Н З N8 Лакокраска	-	-	-	-	-	-	-	-	-	-	-	-
Р Т И	-	-	-	-	-	-	-	-	-	-	-	-
Промнав	-	-	0,134	0,006	0,038	1992г. 0,038	-	-	-	-	-	-
Автотранспорт												

Наименование предприятия	Формальдегид т/г			класс опасности I		Разр. выброс	Год достижения ПДВ	Хлор т/г			класс опасности I		Разр. выброс	Год достижения ПДВ
	1989	1990	1991	1992	1993			1989	1990	1991	1992	1993		
П Н З Чс завод Текстекс	-	11,258,5		1,575	1,145		Разрабатывается							
п/з Респлетос	-	-	-	-	-		-							
П Н З N7 Жирокомбинат	-	-	-	-	-		-							
С З П О	-	-	0,14	0,14	0,14		Разрабатывается							
П Н З N1 Авиационный завод	-	-	-	0,084	0,084		1992г. 0,078							
П З - 3	-	-	-	-	-		-							
П Н З N2 НПЗ им.Кирова	-	-	-	-	-		-							
п/о Нитрон	-	-	-	-	-		-							
П Н З N5 Фурнитурный завод	-	0,079	0,079	0,079	0,079		1991г. 0,079							
Судоремзавод	-	-	-	-	-		-							
П Н З N8 Лакокраска	-	-	-	-	-		-							
Е Т И	-	-	-	-	-		-							
Промнав Автотранспорт	-	-	-	-	-		-							

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Same chart.

SARATOV

DYNAMICS OF EMISSION
FOR THE ENTERPRISES WHICH CAUSE THE MOST AIR POLLUTION
IN THE CITY

Column 1:

Enterprise:

1. PNZ No.6, "Techsteklo" Plant (Technical Glass)
2. P/O (Production Association) "Reflector"
3. Zhircombinat (Fats Factory)
4. CEPO
5. PNZ No.1, Aircraft Plant
6. GPZ-3
7. PNZ No.2, Kirov NPZ
8. P/O Nitron
9. PNZ No. 5, Fitting Plant
10. Shipyard
11. PNZ No.8, "Lakokraska" (Lacquers and Paints)
12. RTI (Radio Technology Institute?)
13. Prommash (Industrial machine building)
14. Automobiles

Column 2:

1. Dust in tons per year,
   Ranked as class 3 in harmfulness

2. Allowed emission

3. Year when it will be reached
   (lower line : PDV - allowable limits)
   The word between figures lower in this column means "It is being worked out"

Column 3:

1. Sulphur dioxide, tons per year, 2 class of harmfulness

2. and 3. same as above

PAGE 6

Continued from the previous page

Column 2:

1. Carbon monoxide in tons per year, 4 class of harmfulness

2. and 3. same as above

Column 3:

1. Nitric oxide, tons per year, 3 class of harmfulness

2. and 3. same as above

PAGE 7

Continued from the previous page

Column 2:

1. Nitric dioxide in tons per year, 2 class of harmfulness

2. and 3. same as above

Column 3:

1. Hydrogen sulphide, tons per year, 2 class of harmfulness

2. and 3. same as above

PAGE 8

Continued from the previous page

Column 2:

1. Phenol in tons per year, 2 class of harmfulness

2. and 3. same as above

Column 3:

1. Hydrogen chloride, tons per year, 2 class of harmfulness

2. and 3. same as above

PAGE 9

Continued from the previous page

Column 2:

1. Ammonia in tons per year, 4 class of harmfulness

2. and 3. same as above

Column 3:

1. Sulfuric acid, tons per year, 2 class of harmfulness

2. and 3. same as above

PAGE 10

Continued from the previous page

Column 2:

1. Hydrogen fluoride in tons per year, 2 class of harmfulness

2. and 3. same as above

Column 3:

1. Hydrogen cyanide, tons per year, class of harmfulness 2

2. and 3. same as above

PAGE 11

Continued from the previous page

Column 2:

1. Formaldehyde in tons per year, 2 class of harmfulness

2. and 3. same as above

Column 3:

1. Chlorine, tons per year, 1 class of harmfulness

2. and 3. same as above

ирж. 1 экз

Выбросы основных загрязняющих веществ

по г. Саратову в 1992 году.

Наименование вещества	Величина выброса тыс. тонн.
Взвешенные вещества	8,638
Сернистый ангидрид	16,235
Окись углерода	8,852
Двуокись азота	13,051

Валовый выброс загрязняющих веществ от стационарных источников в 1992 году составил 107,045 тыс. тонн.

Data Supplied by Vasili Shevchenko, Deputy President,

City Committee for Protection of the Environment, Volgograd

during meetings in Volgograd, in August, 1993

г.ВОЛГОГРАД

Выбросы вредных веществ в атмосферу от стационарных источников и автотранспорта составляют 244.751 тыс.т/год, в том числе: твердых примесей - 29.0 тыс.т/год, окиси углерода - 87.818 тыс.т/год, окислов азота - 25.3 тыс. т/год, углеводородов (без ЛОС) - 67.7 тыс.т/год.

Основной вклад в выбросы от стационарных источников вносят предприятия топливной промышленности - 39.8 %, электроэнергетики - 16.3 %, цветной металлургии - 13.2 %, машиностроения и металлообработки - 7,9 %, химической и нефтехимической промышленности - 6,7 %.

Наибольшие количества специфических вредных веществ выбрасываются предприятиями топливной промышленности: 137.3 т/год фенола, 611.0 т/год метилэтил- кетона, 209.0 т/год синтетических жирных кислот; цветной металлургии - 859.20 т/год плохо растворимых фтористых соединений; черной металлургии - 0.6 т/год свинца,136.7 т/год окиси железа, 1.70 т/год шестивалентного хрома; химнефтепрома - 158.000 т/год аммиака, 101.30 т/год сероуглерода, 247.200 т/год хлористого водорода, 347.5 т/год четыреххлористого углерода и т.д.

На предприятиях города улавливается 618.009 тыс.т/год вредных веществ, из них утилизируется 363.879 тыс.т/год.

Высокая степень улавливания вредных веществ на предприятиях нефтехимической промышленности - 97.3 %,микробиологической промышленности - 94.6 %, химической и нефтехимической - 93.8 %, промышленности строительных материалов - 89.3 %, цветной металлургии - 79.8 %, топливной - 52 % и т.д.

Самая низкая степень улавливания - 26.6 % на предприятиях теплоэнергетики. На ТЭЦ-2, ТЭЦ-3 вредные примеси выбрасываются без очистки.

Из имеющихся 1892 газопылеулавливающих сооружений, обследовано 1790, из них 243 неисправны и неэффективны.

Наиболее неудовлетворительное содержание и эксплуатация установок очистки газов отмечается на предприятиях стройиндустрии. Количество неисправных и неэффективных установок достигает 34,7 % .

На охрану воздушного бассейна израсходовано 132940.94 тыс.руб.

В основном на предприятиях города идет снижение выбросов. Снижение валового выброса вредных веществ в атмосферу объясняется не реализацией природоохранных мероприятий, повышением производственной дисциплины, а свертыванием производственных программ. При этом, из-за несовершенства технологических процессов, сокращение выбросов не находится в прямой зависимости от сокращения выпуска продукции. Так, выпуск стали на заводе "Красный Октябрь" не достигает 50 % фактической мощности, а сокращение выбросов не превышает - 25 %.

Уменьшение выбросов на предприятиях электроэнергетики произошло за счет сокращения отпуска тепла потребителям на 12 %.

Вклад автотранспорта в суммарный выброс составляет 33 %, в том числе: окиси углерода - 65.3 %, окислов азота - 39.2 %, углеводородов - 17.7 %.

В целом по городу от стационарных источников выбросы по сравнению с 1991 годом уменьшились на 10.373 тыс.т/год.

В 1992 году отчет по охране атмосферного воздуха (2тп-воздух) представили 107 промышленных предприятий г.Волгограда, в том числе с установленными предельно допустимыми выбросами (ПДВ) 79, на 28 предприятиях ПДВ не определены.

На предприятиях города 7769 стационарных источников загрязнения, из них 4005 источников с установленными ПДВ.

В течение года на ПО "Химпром" выполнено 19 мероприятий, что позволило сократить выброс вредных веществ на 407.771 т.

Снижение отдельных ингредиентов /пыль неорганическая - 318.722 т., трихлорэтилен - 21 т., 4х-хлористый углерод - 31 т., сероуглерод - 22 т., хлорвинил - 11,603 т., хлор - 3,52 т. и т.д./ осуществлено за счет: усовершенствования схем очистки выбросов в производстве хлорной извести, монтажа схемы очистки абгазов стадии синтеза на "пенном" абсорбере и усовершенствования системы очистки абгазов стадии отдувки серы от монохлористой серы в производстве четыреххлористого углерода, перехода на периодическое омыление тетрахлорэтана до трихлорэтилена и переводом системы очистки абгазов стадии конденсации и ректификации в производстве хлорвинила, проведение опытных работ на 3-х ВЭП в системе очистки ленточных и дымовых газов в производстве карбида кальция, установки двух новых реакторов-полимеризаторов в производстве ПХВ, закрытия производства хлорэф-40 и т.д.

На Волгоградском нефтеперерабатывающем заводе проведена реконструкция градирен БОВ-1,3 СЖК с применением пластиковых материалов, новых распылительных коллекторов и распылителей. Данное мероприятие позволило снизить выбросы в атмосферу углеводородов на 2423 т, сероводорода - 24,8 т, фенола - 42,8 т.

На Волгоградском заводе теплоизоляционных изделий и конструкций проведен монтаж систем пылегазоочистки линии N 1, монтаж установки искрогашения на линии N 1 (снижение выбросов взвешенных веществ на 10 т).

На Волгоградском комбинате силикатно строительных материалов введен скруббер в печном отделении известкового завода, проведен монтаж систем аспирации завода армосиликатных изделий с установкой фильтра (снижение выбросов взвешенных веществ на 48,89 т).

Проведен ряд мероприятий и на других предприятиях города, например, на Волгоградском заводе тракторных деталей и нормалей, ВолгоГРЭС, ПО"Каустик" и т.д.

В течение года, по результатам проверок промышленных предприятий, специалистами комитета предъявлено 3 претензии за загрязнение выбросами вредных веществ атмосферного воздуха на сумму 333,1 тыс.руб.; предъявлено 133 протокола на штраф руководителям и инженерно-техническим работникам предприятий за нарушение природоохранного законодательства в части охраны атмосферного воздуха на сумму 85,1 тыс.руб.; приостанавливалась эксплуатация технологического оборудования, всего выдано 18 постановлений и предупреждений на приостановку отдельных производств, цехов и участков.

Таким образом, в результате перечисленных мер, принимаемых комитетом, в 1992 году приведено в исправное состояние 60 очистных сооружений и установок, введено в эксплуатацию 25, в том числе - 8 за новыми источниками, 17 - за действующими, реконструировано - 18.

Не смотря на принимаемые меры, на предприятиях не исключены аварийные и залповые выбросы. Так, аварийные выбросы наблюдались на алюминиевом заводе (выбросы фтористых соединений), заводе им.Петрова (выбросы хлора).

В 1986 году для Волгограда был разработан сводный том, в котором учтены выбросы 56 предприятий города по 81 ингредиенту. В настоящее время готовиться вторая редакция сводного тома.

На 1992 год по сернистому ангидриду установлены нормативы предельно-допустимых выбросов (по ведомственным томам) в объеме 20.35 тыс.т/год, лимиты (ВСВ) в объеме 23.807 тыс.т/год, по окислам азота ПДВ - 16.095 тыс. т/год, лимит (ВСВ) - 25.970 тыс.т/год.

INTRODUCTION

This "Review of Emission of Harmful Pollutants into the Atmosphere of the City of Volgograd" reflects the situation with air pollution in Volgograd. Information on the emission was collected from statistic reports on air protection for the year of 1992 (f.2tp-air).

Comparative study of the reports presented by industrial enterprises, was carried out by experts of the Volgograd City Committee on Environmental Protection. The summarized data cannot be compared to the information produced by local offices of the Central Statistic Bureau, because the Regional Statistic Bureau has prepared their summary by districts of the city, but not by industries, as it was recommended in the "Model..."

Auto pollution was determined through specific indexes of pollution emitted into the atmosphere, when the fuel is burned by mobile sources. Here, the data on fuel consumption was received from local Statistic Bureaus (f. 4-SN).

In accordance with the data received from the Central Statistic Bureau, as of January 1, 1993, the population in Volgograd was 1,033,000 people. The area of the city of Volgograd was 400 square kilometers.

VOLGOGRAD

Emission of harmful pollutants from static sources and automobiles into the atmosphere is 244,751 tons/year, including hard impurities = 29,000 tons, carbon monoxide = 87,818 tons, nitric oxide = 25,300 tons, hydrocarbon (without LOS) = 67,700 tons.

The main input into pollution comes from enterprises of:

- gas and fuel industry = 39.8%;
- electric-power industry = 16.3%;
- non-ferrous metallurgy = 13.2%;
- machine building and metal works = 7.9%;
- chemical and oil industry = 6.7%.

The biggest quantities of specific pollutants are emitted by the following industries (per year):

- gas and fuel industry:
  137.3 tons of phenol;
  611.0 tons of methyl-ethyl-ketone;
  209.0 tons of synthetic fatty acids;
- non-ferrous metallurgy:
  859.20 tons of poorly dissolving fluoride compounds;
- ferrous metallurgy:
  0.6 tons of lead;
  136.7 tons of iron oxide;
  1.70 tons of hexavalent chromium;
- chemical and oil industry:
  158.000 tons of ammonia;
  101.30 tons of carbon bisulfide;
  347.5 tons of carbon tetrachloride, etc.

Enterprises in the city were able to collect 618,009 tons of harmful pollutants, and 363,879 tons out of this number have been recycled.

The highest level of collecting the pollutants belongs to the following industries:

- petrochemical industry: 97.3%;
- microbiological industry: 94.6%;
- chemical and oil industry: 93.8%;
- construction materials industry: 89.3%;
- non-ferrous metallurgy: 79.8%;
- gas and fuel industry: 52.0%, etc.

The lowest level of collection the pollutants belongs to the heat power industry: 26.6%. Thermoelectric plants No. 2 and No. 3 emit their waste without purification or recycling.

1790 out of 1892 gas and dust arresting devices have been inspected, and 243 were found out of order or non-efficient.

The most unsatisfactory maintenance of the recycling devices was found at the enterprises of construction industry. The number of broken or non-efficient devices there reaches 34.7%.

132,940.94 thousand rubles have been spent on air purification in the city.

In general, air pollution in the city reduces. This reduction of the gross industrial emission can be explained by neither environmental protection program, nor raise in the production discipline, but by closing of some industrial programs. At the same time, the low level of technology causes the fact that reduction of the air pollution is not in the direct connection with the decline in productivity. For example, steel output at the Red October Factory does not reach 50% of its actual capacity, but reduction of air pollution is not larger than 25%.

Reduction of air pollution caused by enterprises of the electric power industry was reached as a result of reduction of heat supply to the customers by 12%.

Automobiles emit 33% of harmful pollutants, including carbon monoxide = 65.3%; nitric oxide = 39.2%; hydrocarbon = 17.7%.

Total reduction in emission from the static sources of pollution in the city, have been reduced to 10,373 tons per year since the year of 1991.

The 1992 report on air pollution (2TP-Air) was presented by 107 industrial enterprises of Volgograd including 79, who indicated maximum effluent tolerance (PDV) and 28 who did not indicate their PDV.

There are 7769 static sources of pollution at the enterprises of the city, 4005 sources out of this number do not have fixed PDV.

During one year, Production Association Khimprom has undertaken 19 actions which allowed to reduce emission of harmful pollutants by 407.771 tons.

Reduction of some ingredients (non-organic dust = 318.722 tons, ethylene trichloride = 21 tons, carbon tetrachloride = 21 tons, carbon bisulfide = 22 tons, vinyl chlorine = 11,603 tons, chlorine = 3.52 tons, etc.) was reached through the following measures:

- improvement of the circuit of air purification in the lime hydrochloride production;
- improvement in the mounting of the circuit of (abgas = a type of

industrial emission) cleaning on the stage of synthesis in the "froth" absorber,
- improvement in the system of cleaning of industrial emissions (abgas) at the phase of separation of sulphide from sulphide monochloride in the production of carbon tetrachloride,
- transition to the periodical saponification of ethane tetrachloride to ethylene trichloride,
- transition of the system of (abgas) cleaning at the stage of condensation and rectification in the production of vinyl chlorine,
- conducting experiments at three VZP in the system of cleaning for (lean) and flue gas in the production of calcium carbide,
- installation of two new reactors-polymerizators in the production of polyvinyl chlorine,
- closing production of (chloref)-40, etc.

At Volgograd Oil Processing Factory there were reconstructed water-cooling towers BOV No. 1 and No. 3 SZK with the use of plastic materials, new spray collectors and spray systems. This measure allowed to reduce emission of the following air pollutants:

- hydrocarbon by 2423 tons,
- hydrogen sulphide by 24.8 tons,
- phenol by 42.8 tons.

At Volgograd Heat Insulator Products a gas and dust suppression system was mounted for the production line No. 1, and a spark suppression system was mounted for the production line No. 1, which reduced emission of suspended matter by 10 tons.

At Volgograd Factory of Silicon Construction Materials, there was installed a scrubber in the oven section of the Lime production facility, and aspiration systems with a filter were installed at the Reinforced silicon production facility, which reduced emission of suspended matter by 48.89 tons).

There were measures taken at other industrial enterprises of the city, such as Volgograd Plant of Tractor Parts, VolgoGRES, Production Association "Caustic", and others.

During a year, resulting from inspection of industrial enterprises, specialists of the Committee filed three complaints for air pollution for the amount of 333.1 thousand rubles; 133 protocols for a fine were presented to the managers and engineering and technical personnel for violation of the environmental protection law, regarding air pollution, in the amount of 85,1 thousand rubles; exploitation of certain technological equipment was suspended; 18 decrees and notifications for suspension of certain production facilities were filed.

Resulting from the above measures taken by the Committee in 1992, 60 purification facilities were fixed, 25 new facilities were built and launched, including 8 for new enterprises, 17 - for existing enterprises, and 18 facilities were reconstructed.

In spite of all measures taken, a possibility of accidental emission of harmful pollutants is not excluded. For example, such accidental emission took place at Aluminum Plant (fluoride compounds), and at Petrov's Factory (chlorine).

In 1986, a summary was presented to the city of Volgograd, where 56 enterprises of the city were tested by 81 criteria. Today, a new edition of the summary is being prepared.

In 1992, there were fixed regulations for the maximum allowance for anhydride sulphide emission (by industries) in the amount 20,350 tons per year, (VSV) limitations in the amount of 23,807 tons per year, maximum allowance for nitric oxide - 16,095 tons per year, (VSV) limit - 25,970 tons per year.

Annex B

Requirements of the Committee on Federal Sanitary and Epidemiological Inspection

The preparers of the EA met with Mr. E.A. Maximov, Chief Federal Medical Doctor of Ryazan on 8.23.93. Mr. Maximov prepared a statement on his department's requirements for pipe replacement. This statement follows:

From: Committee on Federal Sanitary and Epidemiological Inspection

To: A.S. Yevstefeyev,
Manager of the Trust "Ryazangorgas"

Subject: Reconstruction of gas conduit in Ryazan

In the following course of reconstruction of the gas conduit in Ryazan, the following measures should be taken:

1. Following instructions given in SN&P 2.04.08-87: "Gas Supply" and "Safety Rules for Maintenance of the Gas Utilities."

2. Measures for provision of gas supply in accordance with the Master Plan for the city of Ryazan.

3. Using advanced technologies which provide more economical use of fuel.

4. Measures for cultivation of land and restoration of greenery.

5. Using automatic control systems in the gas supply business.

6. Gas supply of a resort "Solotech" and other resorts within the city limit of Ryazan.

7. Using high technology for production and construction works, which will provide optimal working conditions for the employees.

8. Measures for liquidation of small boiler houses and remodelling of the boiler houses which burn solid and liquid fuel, into boiler houses which burn gas.

9. Resolutions on environmental protection in accordance with SN&P 2.05.06-85: "Conduits."

Chief Federal
Sanitary Doctor
of Ryazan E.A. Maximov

Комитет
Государственного санитарного
эпидемиологического надзора

24 08 1993
г.Рязань, ул.Свободы 89
тел. 77-24-02
№ 154

Управляющему трестом
"Рязаньгоргаз"
Евстефееву А.С.

"По вопросу реконструкции
газопровода г.Рязани".

В ходе проектных работ по реконструкции газопровода г.Рязани следует предусмотреть:

1. Выполнение требований СНиП 2.04.08-87 "Газоснабжение" и "Правил безопасности в газовом хозяйстве".
2. Мероприятия по газофикации в соответствии с генеральным планом развития г.Рязани.
3. Применение передовых технологий обеспечивающих более рациональное использование топлива.
4. Мероприятия по рекультивации земли и восстановлению зеленых насаждений.
5. Автоматизированную систему управления в системе газоснабжения.
6. Газоснабжение куротного п.Солотча и других поселков, включенных в черту г.Рязани.
7. Современные методы производства строительно-монтажных работ, обеспечивающих оптимальные условия труда работающих.
8. Мероприятия по ликвидации мелких котельных и перевод котельных, работающих на твердом и жидком топливе на газ.
9. Решения по охране окружающей среды в соответствии с СНиП 2.05.06-85 "Магистральные трубопроводы".

Главный государственный
санитарный врач г.Рязани Максимов Е.А.

OCCUPATIONAL HEALTH

GENERAL GUIDELINES FOR INDUSTRIAL PROJECTS

Introduction

1. Even in the United States, the estimates for new cases of occupational diseases vary considerbly. The Public Health Service estimate is 390,000 new cases of occupational diseases per year. This should be compared with 1 million new cases per year in another study. On the other hand, statistics of excess mortality among workers from several major industries suggest that as many as 100,000 deaths occur per year as a result of occupational diseases.

2. Figures for LDC's are not known but visits to several industrial sites by members of the Office of Environmental Affairs have shown that the situation is generally worse than in the United States. As a result, the World Bank feels morally obligated to eliminate as best as possible the problems of occupational health in the industrial projects it is financing.

3. This guideline lists the most common health hazards in a project. The sponsor should be aware of our concern for the continuing good health of a firm's employees. To minimize the existing danger, employees should know the potential hazards facing them. The sponsor, on the other hand should have a health care program stressing the prevention and the cure of the industrial diseases associated with the project. This should include pre-employment and regular medical examinations as well as the tests and analyses necessary for the detection of the diseases. A complete medical record should be carefully kept for each employee.

Definition of Occupational Diseases

4. A joint ILO-WHO committee has defined the objectives of an occupational health program as follows:

> The promotion and maintenance of the highest degree of physical, mental and social well being of workers in all occupations; the prevention of workers diseases caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psycological condition.

5. We shall define as "occupational health" hazards those resulting in a slow impairment of health. These hazards can be classified in four categories.

Biological:	bacteria, fungi, insects;
Chemicals:	toxic chemicals, dusts and gases. Their action can be mutagenic, teratogenic or carcinogenic;
Physical:	heat, noise, radiation or vibration;
Stress:	created by chemical, ergonomic, physical or psychological factors.

The hazard arises through the interaction of the environment, the job and the worker.

6. Prevention should be the rule and cure the exception. Engineering solutions should be preferred to individual protection. For instance, a process modification should be adopted instead of compelling operators to work with a respirator.

Specific Health Hazards

Carcinogens

7. There is mounting evidence that 75 to 95% of all cancers are environmental. It is however not easy to prove that a cancer has been induced by occupational factors and still more difficult to determine the exact cause.

8. Some of the most common chemicals or physical phenomena able to create cancer are asbestos, VCM, tar, dyestuffs, aniline, chromates, arsenic, several organic molecules containing benzene, sunlight, X-rays, ionizing radiation.

9. A tumor can appear at the point of contact (asbestos in lungs) or some other body site (VCM in liver cancer).

10. New chemicals are introduced by the hundreds every year and old chemicals first thought to be safe are now suspected of being carcinogenic. For this reason the number of materials with carcinogenic properties will grow with time.

11. In any World Bank project involving chemicals the following question should always be asked: Is any of these chemicals a carcinogen?

Dusts

12. Any type of dust is in the long run harmful to the lungs and consequently to the cardiovascular system.

13. The most common dust diseases are silicosis (silica dust) asbestosis (asbestos dust) pneumoconiosis (coal dust). (1) In the United States the population at risk from these diseases is reported to be between 2 and 2.5 million.

Ergonomic Factors

14. The study of ergonomics include physiological and psychological stresses of the human body resulting in fatigue, errors, accidents and sometimes diseases.

15. These are strong suspicions that stress is a major cause of heart disease and also of other degenerative diseases. Stress can also affect mental health.

16. The combined effects of stress (heat or noise) with other health hazards is often synergistic and the synergism may be much more important than the simple effect of stress at low levels.

Heat Stress

17. This type of stress is commonly encountered in mining and in any industry where heating of materials takes place. The work performance is greatly affected by the temperature and the humidity of the environment.

18. The heat generated by the human body must be dissipated to keep the temperature at 37°C. Like any other heat exchanger, the body has a temperature corresponding to maximum efficiency. If the temperature changes, the efficiency decreases.

19. The effects may be physical and psychological with accrued fatigue, poor coordination and additional mistakes. If the stress is too intense, heat stroke may develop and could be fatal; heat exhaustion (loss of body water) and heat cramps (loss of salt) may also be present.

20. The cardiovascular system suffers from heat stress. Synergism between heat stress and the other hazards (i.e. toxicants) has been proven and this raises questions about the general applicability of TLV's for heat (see references).

Noise

21. Noise contributes to hearing loss and accidents but also triggers physiological and psychological body changes. The cardiovascular, endocrine and neurological functions are the most affected. Epidemiological studies show that cardiovascular problems, neurological changes and social conflicts are more frequent in high level noise industries.

22. The limit of 90 dBA is primarily set to conserve hearing. Because of probable synergism between noise and other stress factors, the level should be decreased below 90 dBA although there are, at present, insufficient results upon which to base a safe level.

Radiation

23. Any type of radiation can be harmful. Ultraviolet radiation may burn the skin and the eyes and cause skin cancer. Infrared may have the same effects except for cancer.

24. Ionizing radiation coming from radioactive materials or electromagnetic sources harms body tissue. They include alpha and beta particles, neutrons, protons, as well as gamma and X-rays. Their biological effects may be somatic or genetic.

25. Somatic effects include dermatitis, skin cancer, leukemia, cataract, sterility and a shorter life span. Genetic effects are also very dangerous but less well known. They can produce mutations. The long term effect is dependent upon whether the mutant is able to survive or to reproduce.

Toxic Chemicals

26. The toxic chemicals, listed at over 12,000 in the United States, are the carcinogens (see above), the gases, the metals or the chemical compounds affecting health or endangering life. They can enter the human body via the mouth, the skin, the eyes, the respiratory tract or any other route.

27. Local effects include injury to the skin, the eyes and the mucous membranes. Systemic effects happen when the chemical enters the body and attacks the internal organs

28. Gases, even the non-toxic ones, reduce the oxygen content of the air and this in turn can lead to asphyxiation which itself can result in death or permanent brain damages (i.e. accidents with carbon dioxide and nitrogen). Sulfur dioxide, sulfur trioxide, sulfuric acid mist, chlorine, ammonia, nitrogen oxides and alkali mists cause respiratory diseases. Long term exposure leads to a chronic condition.

29. Industrial solvents can cause anemia, liver and kidney damage, cardiovascular diseases and neurological disorders. Benzene, phenols, carbon disulfide, and carbon tetrachloride are examples of products widely used but also very dangerous to health.

30. Toxic metals include lead, mercury, cadmium, nickel, gold and beryllium. Chronic exposure produces systematic effects often resulting to shorter life expectancy.

31. Pesticides exposure may result in irreversible neurological disorders.

Vibration

32. Vibration can be a serious form of stress causing anemia and lesions in the gastrointestinal tract resulting in internal hemorrhaging.

Combined Hazards

33. Most often the combination of two or more hazards is synergistic. In the working world, the employee is confronted not by isolated hazards but by several of them. Yet studies of combined hazards are very rare and most synergisms are likely to be found after their effects have taken place. Added caution should be the rule if combined hazards are present.

Severity

34. The measure of severity in health hazards is very difficult. They are slow acting, cumulative; their effects may not be visible for several years. The magnitude of these effects will vary with non-occupational factors, like health of the individual, climate, diet, etc. For all these reasons, no severity index exists as yet for occupational diseases with the consequences that the seriousness of the hazards is not recognized. The chance for a worker handling benzene and dying from cancer, may be greater than the chance of another man having a serious accident. Precautionary measures will be taken to prevent the accident. Much less will be done to protect health against the deleterious effect of benzene.

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THE WORLD BANK

APRIL 1984

SAFETY

GENERAL GUIDELINES FOR INDUSTRIAL PROJECTS

Introduction

1. In the United States alone, work related disabling injuries amount to 2.8 million and cause 14,000 deaths every year. Worse than these figures is the fact that the increase of the reported injury rate in industry reached 29% from 1951 to 1970.

2. Although figures for LDC's are not known or are much less reliable, it is common knowledge that the situation there needs improving. The World Bank has, in consequence, a moral obligation to make certain that the necessary safety requirements are taken in the industrial projects it is going to finance.

3. This guideline lists the most common safety hazards to look for when appraising a project. The sponsor should be made aware of our concern for the proper handling of the safety problems. This includes the safety training of the employees, the organization of safety in the plant (procedures - meetings - supervision) and the involvement of the top management in the safety program.

Definition of Safety Hazards

4. Safety hazards are those causing burns, electrical shocks, cuts, bruises, sprains, broken bones and loss of limb, eyesight or hearing. They result in immediate and sometimes violent harm, they are associated with industrial equipment or processes and often involve tasks requiring training and care.

5. We shall only deal in this guideline with the hazards defined in the preceding paragraph. The same hazards resulting in a slow impairment of health will be dealt with in the "Occupational Health" guide.

Specific Safety Hazards

Dangerous Stationary Machines

6. Machine moving parts, if unshielded, can cause injury. Typical machines do the following functions: sawing, molding, rolling, cutting, mixing, flattening, bending, grinding. They have moving parts which can cut, harm, mutilate and possibly kill.

Electricity

7. Electrocution from contact with live conductors or other electrical equipment constitutes the most common hazard next to noise. The higher the voltage, the greater the danger. Proper grounding and shielding with strict observance of electrical construction codes will decrease the hazard without eliminating it totally.

Ergonomic Factors

8. The study of ergonomics includes physiological and psychological stresses of the human body resulting in fatigue, errors and accidents. Ergonometric factors such as temperature, lighting, humidity, accessibility to control, shape and size of tools, will influence not only the well-being but also the efficiency of the worker.

Eye Protection

9. Machines throwing off dust particles or flying chips should be properly shielded to avoid any eye damage. Chemical spills, leaks, and splashes are also dangerous to the eyes. Eyeglasses or eye goggles should be mandatory for certain types of jobs.

Falls

10. Falls are a major cause of industrial accidents. They could be easily prevented by guardrails, warning posters, safety belts and nets.

Fires and Explosions

11. Rupture of pressurized vessels or high speed of certain chemical reactions result in explosion often causing extensive fires. Poor housekeeping, ignorance or disregard of smoking rules or open fire regulations may also result in fires or explosions. Fire insurance should be a double protection for the worker. First, the insurer will inspect the premises and point out the problems; secondly, the insurance will go up in case of a major fire or repeated small fires.

Heat Stress

12. Conditions of extreme heat or cold will generate considerable physical stress in the human body. The first effects of heat are discomfort, sweating and cramps followed by heat stroke. If the body temperature increases markedly, permanent harmful effects can occur. Heat stress decreases accuracy, concentration and efficiency.

Moving and Lifting Equipment

13. Guardrails, warning horns or bells and aisle markers will decrease accidents due to moving or lifting equipment. Controlling the moving speed of the machine will also contribute to better saftey. All

This would prevent crushing part of the operator's body by the machine and crushing the operator between the machine and the ground.

Noise

14. The pressure of a sudden loud noise can damage the eardrum. Prolonged loud noise can cause hearing loss. Loud background noise (90 dBA) dulls human senses, including visual acuity, and increases accident rates.

Vibrations

15. Heavy equipment for transportation, construction and agriculture is the largest source of occupational vibration. The jobs most commonly affected are those of truck drivers, railroad workers, bus drivers and foundry workers. The physiological stress of the human body bracing itself against vibrations increases fatigue and after a certain time will slow reflexes. This, in turn, increase the probability of an accident. Vibrations and loss of visual acuity are also strongly related.

Combined Hazards

16. Individual hazards, rarely found alone, often combine in a synergistic way. For instance, carbon monoxide is more toxic when heat is also present.

Severity

17. Severity can be measured in several ways. The most common presently used are:

(a) for an industrial plant:

$$\text{severity rate} = \frac{\text{number of days charged} \times 1000}{\text{number of man hours worked}}$$

(b) for a plant, industry or country:

$$\text{Injury frequency rate} = \frac{\text{number of accidents} \times 10^6}{\text{number of man hours}}$$

18. The frequency, which is the number of accidents per million man hours worked, is as follows in the US:

14.8 - all industries
69.9 - longshoring
36.1 - lumber and wood products
38.5 - meat and meat products

19. The three industries mentioned are the most accident prone in the U.S.

Conclusion

20. As a first approximation, the sponsor of any World Bank project should be asked to set as its goal an injury frequency rate of less than 15. The sponsor should also be required to buy the two volumes "Encyclopedia of Occupational Health and Safety" published by the International Labour Office in Geneva, Switzerland. The members of the appraisal mission should remember that in safety, more than anywhere else, the dissemination of information down to the last level in the plant and the utilization of information by every management level are important for the success of the safety program.

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SECTION 8 APPENDICES

8-A Questionnaire

8-B Meetings and Participants

8-C Scenario Analyses

D R A F T

Appendix 8A

Questionnaire

INFORMATION FOR FINANCIAL ANALYSIS OF LOCAL GAS DISTRIBUTION COMPANY

1. General map of gas pipelines network.

2. Organizational chart of the local gas distribution company (that one which should be the first on our list).

3. Job descriptions for managerial positions up from deputy department chief, including general manager (director).

4. Copy of the "Explanation Note" to the 1992 fiscal year annual report, including major financial data. Availability of financial data for 6 months of 1993 will be also highly appreciated.

5. Payable and receivables timetable on the monthly basis.

6. Costs of gas(purchasing prices), operational and maintenance costs(by major categories), general and administrative expenses : in other words major categories of cost structure.
   Also allocation structure of revenues : in what categories and how the revenue for each cubic meter of gas sold, is dropped in ?

7. On what regulatory/legal basis is based the relationship with local banking institution/governmental fiscal office ?

8. Structure of the customer basis : How many customers are served in each classification (typically residential, commercial, industrial) ?
   How much gas is sold to each classification (recent history as well as forecasts) on annual and peak day basis ?
   How much revenue has been derived from each classification ?

9. Length of the pipeline network, age, pressures, diameters, type of pipe(steel vs.plastic if it is a

case), cathodic protection.

10. Major categories of maintenance expenditures in 1992.

11. How much service is metered vs. being offered at a flat rate ?
How many customers have delinquent accounts and for what volumes/cash accounts ?
Are there significant pending liabilities or litigations and how they could be applied for different categories of customers ?

Appendix B

MEETINGS & PARTICIPANTS

MOSCOW

August 10, 30,; September 6, 16, 1993

A. O. Rostroigazifikatsiya (Rosgaz)

1.	Boris Vasilenko	General Direktor;
2.	Valentina Turusina	Deputy general director, chief accountant;
3.	Ivan Dudin	Deputy general director.

August 11, 12; September 11, 1993

A. O. Gasprom

1.	Viacheslav Sheremet	Deputy chairman of the Board;
2.	Alexandr Brianskikh	Chief of gas networks and supply development department;
3.	Nikolay Beliy	Chief of foreign economic relations department.

September 2, 17, 1993

Ministry of Fuel and Energy.

1.	Alexandr Omelchenko	Chief of gas industry department;
2.	Gennadiy Vasiliev	Chief of foreign economic relations department.

VOLGOGRAD

June 17; August 17-19; September 13-14, 1993

Volgogradgorgas

1.	Vladislav Kochubey	Manager;
2.	Mariya Gvardeytseva	Chief accountant;
3.	Olga Zabolotneva	Chief of gas supply department;
4.	Olga Sizova	Deputy chief of technology-production department;
5.	Elizaveta Vikulova	Deputy chief of construction group;
6.	Genndiy Lobanov	Planning department.

SARATOV

August 20-26, 1993

GiproNiiGaz

1.	Vladimir Gashilov	General Director;
2.	Irina Kopteva	Chief of economics laboratory.

Saratovgorgas

1.	Mikle Matveev	Manager;
2.	Valentina Loboda	Deputy manager, economics;
3.	Lidiya Bistrova	Chief accountant.

RYAZAN

July 13, 14; September 8, 1993

Ryazangorgas.

1.	Alexandr Evteev	Manager;
2.	Vera Aristova	Deputy manager, economics;
3.	Klara Kirillova	Chief accountant.

VORONEZH

June 23; September 9, 1993

Voronezhoblgas.

1.	Boris Alpatov	Manager;
2.	Asya Li	Deputy manager,economics.

Voronezhgorgas.

1.	Viktor Sherbinin	Manager;
2.	Alexandr Sokolov	Chief engineer;
3.	Sergey Ovsyannikov	Deputy manager, economics;
4.	Svetlana Buchneva	Chief of planning;
5.	Lubov Tikhonova	Deputy chief accountant;
6.	Nadejda Anisimova	Chief of gas supply department.

RYAZAN

Case–R–1

INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		203,984	1,219,702	7,179,206	17,416,652	17,448,824	17,422,142	17,388,671	17,348,336	17,749,055	18,150,460
Natural Gas, Other		21,330,175	60,691,740	193,811,555	355,724,378	370,196,185	386,031,443	402,135,153	417,412,054	434,900,384	452,427,722
Natural Gas, Total		21,534,158	61,911,442	200,990,761	373,141,230	387,645,010	403,453,584	419,523,824	434,760,390	452,649,439	470,584,182
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	1,747,019	21,544,036	61,953,186	201,056,282	373,225,529	387,739,048	403,553,422	419,629,825	434,872,920	452,768,914	470,711,026
Other Revenues	2,245	18,480	78,097	122,579	157,710	175,931	186,779	196,310	210,526	223,517	237,303
TOTAL OPERATING INCOME	**1,749,264**	**21,562,517**	**62,031,283**	**201,178,861**	**373,383,239**	**387,914,979**	**403,740,200**	**419,826,136**	**435,083,446**	**452,992,431**	**470,948,330**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		74,477	439,093	2,584,514	6,270,067	6,281,577	6,271,971	6,259,922	6,245,401	6,389,660	6,536,326
Natural Gas, Other		18,988,999	54,030,285	172,539,023	316,680,481	329,563,879	343,661,077	357,997,263	371,597,389	387,166,220	402,769,777
Natural Gas, Total		19,063,476	54,469,377	175,123,537	322,950,548	335,845,456	349,933,048	364,257,184	377,842,790	393,555,880	409,306,103
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,135,982	19,088,992	54,577,207	175,292,783	323,168,299	336,088,366	350,190,936	364,530,994	378,133,465	393,864,493	409,633,751
Payroll (Wages & Bonus)	70,050	646,680	2,732,869	4,289,427	5,518,765	6,156,391	6,535,992	6,939,520	7,366,976	7,821,591	8,304,014
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	52,411	483,842	2,044,716	3,209,324	4,129,108	4,606,176	4,890,191	5,192,108	5,511,928	5,852,069	6,213,015
TOTAL OPERATING EXPENSES	**1,258,443**	**20,219,514**	**59,354,792**	**182,791,533**	**332,816,172**	**346,850,933**	**361,617,119**	**376,662,623**	**391,012,369**	**407,538,153**	**424,150,780**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**490,821**	**1,343,003**	**2,676,492**	**18,387,327**	**40,567,067**	**41,064,047**	**42,123,082**	**43,165,513**	**44,071,078**	**45,454,278**	**46,797,549**

Unaudited – For Study Purposes Only

RYAZAN

Case–R–1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
DEDUCTIONS											
Depreciation		95,702	581,501	1,410,085	2,677,136	3,424,326	3,635,469	3,859,921	4,097,681	4,350,549	4,618,894
Value Added Tax (on Sales)	385,665	409,174	1,229,330	4,293,917	8,342,872	8,608,447	8,893,748	9,183,139	9,456,576	9,817,404	10,179,546
Net Value Added Tax (on Projects)		0	1,015,051	2,372,806	3,083,748	(1,402,226)	(3,792,550)	(1,276,830)	0	0	0
Gas Rehabilitation Fund		245,504	737,598	2,576,350	5,005,723	5,165,068	5,336,249	5,509,883	5,673,946	5,890,442	6,107,728
TOTAL DEDUCTIONS	385,665	750,380	3,563,480	10,653,158	19,109,478	15,795,616	14,072,916	17,276,112	19,228,203	20,058,395	20,906,157
NET INCOME BEFORE INTEREST and TAXES	105,156	608,261	(820,903)	7,837,805	21,591,041	25,417,302	28,208,216	26,057,209	25,021,020	25,585,022	26,092,196
INTEREST and TAXES											
Interest Expenses		0	236,742	993,176	2,243,404	3,342,037	3,710,135	3,555,548	3,246,368	2,937,190	2,628,012
Currency fluctuation loss on debt			0	6,415,440	6,868,441	1,901,394	1,065,294	842,434	827,616	773,092	709,833
Taxes:											
Corporate Income Tax	33,396	429,761	856,477	5,883,945	12,981,461	13,140,495	13,479,386	13,812,964	14,102,745	14,545,369	14,975,216
Excess Payroll Tax	14,497	126,103	532,909	836,438	1,076,159	1,200,496	1,274,518	1,353,206	1,436,560	1,525,210	1,619,283
Property Tax		31,606	234,014	316,752	785,198	1,321,846	1,508,860	1,640,630	1,711,350	1,773,330	1,840,219
Road Tax		9,820	29,504	103,054	200,229	206,603	213,450	220,395	226,958	235,618	244,309
TOTAL INTEREST and TAXES	47,893	597,289	1,889,647	14,548,805	24,154,894	21,112,871	21,251,643	21,525,176	21,551,598	21,789,809	22,016,872
NET INCOME	57,263	10,971	(2,710,550)	(6,710,910)	(2,563,852)	4,304,431	6,956,573	4,532,034	3,469,424	3,795,213	4,075,325
Memo: Weighted Ave Cost of Gas		9,050	26,459	85,552	156,683	162,172	167,545	173,253	179,302	185,302	191,489
Memo: Weighted Ave Sales Price of Gas		10,368	30,479	99,515	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,190	3,664	12,807	24,580	25,352	25,973	26,644	27,379	28,203	29,059
Memo: Cash Flow From Natural Gas		2,470,682	7,442,065	25,867,224	50,190,682	51,799,554	53,520,536	55,266,640	56,917,600	59,093,560	61,278,079
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

RYAZAN

Case–R–1

BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	58,961	544,494	2,845,527	4,156,124	5,191,208	5,728,079	6,047,697	6,387,461	6,747,372	7,130,151	7,536,344
Short–Term Investments	17,843	2,160,670	3,195,866	12,031,620	22,317,876	27,703,293	37,429,690	41,554,229	45,069,356	49,019,668	53,221,818
Cash & Short Term Investments	76,824	2,705,164	6,041,393	16,187,744	27,509,083	33,431,372	43,477,386	47,941,690	51,816,728	56,149,819	60,758,162
Accounts receivable – Gross *(See Note C.)*	153,761	1,896,165	5,452,715	17,665,661	32,846,873	34,126,258	35,518,136	36,933,076	38,274,674	39,849,762	41,428,910
Materials & equipment	10,323	95,299	402,732	632,116	813,279	907,244	983,184	1,022,650	1,085,643	1,152,635	1,223,731
Other assets	3,000	695	117,039	183,701	236,350	263,657	279,914	297,196	315,502	334,972	355,632
Total Current Assets	243,908	4,724,323	12,013,879	34,699,222	61,407,585	68,728,531	80,238,621	86,194,612	91,492,546	97,487,191	103,766,435
Fixed assets											
Adusted Cost of Fixed Assets	310,999	2,871,046	17,445,036	42,302,546	80,314,074	102,729,786	109,064,070	115,797,619	122,930,433	130,516,467	138,566,511
Less: Accumulated Depreciation	212,548	2,057,878	9,278,095	15,972,698	23,227,566	29,335,556	34,779,845	40,787,052	47,397,103	54,672,526	62,683,522
Net Revalued Assets	98,451	813,167	8,166,941	26,329,848	57,086,507	73,394,230	74,284,225	75,010,567	75,533,330	75,843,941	75,902,988
TOTAL ASSETS	342,359	5,537,490	20,180,820	61,029,070	118,494,092	142,122,762	154,522,845	161,205,179	167,025,876	173,331,131	179,669,423
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Total Current Liabilities	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Long Term Debt		0	4,734,831	15,128,690	29,739,397	37,101,348	37,101,348	34,009,569	30,917,790	27,826,011	24,734,232
Additional debt due to currency rate			0	6,415,440	13,283,881	15,185,275	16,250,569	15,760,252	15,017,182	14,095,282	13,002,362
Other Funds	99,934	922,559	3,898,736	6,119,337	7,873,123	8,722,766	9,324,309	9,899,966	10,509,796	11,158,357	11,846,566
Total Long Term Liabilities	99,934	922,559	8,633,568	27,663,466	50,896,401	61,069,389	62,676,225	59,669,807	56,444,769	53,079,650	49,583,160
Other Liabilities & Equity											
Net Revaluation Surplus		810,418	3,433,696	8,085,335	15,631,399	22,227,051	26,752,514	31,338,777	35,959,221	40,620,381	45,298,312
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727
Retained Earnings	0	10,971	(2,699,578)	(9,410,489)	(11,974,341)	(7,669,910)	(4,191,623)	(1,925,607)	(190,895)	1,706,712	3,744,374
Net Equity	17,727	839,116	751,844	(1,307,427)	3,574,785	14,574,868	22,578,618	29,430,898	35,786,053	42,344,819	49,060,413
TOTAL LIABILITIES & EQUITY	342,359	5,537,491	20,180,820	61,029,070	118,494,091	142,122,760	154,522,844	161,205,179	167,025,875	173,331,130	179,669,423

Note B Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		10,971	(2,710,550)	(6,710,910)	(2,563,852)	4,304,431	6,956,573	4,532,034	3,469,424	3,795,213	4,075,325
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		95,702	581,501	1,410,085	2,677,136	3,424,326	3,635,469	3,859,921	4,097,681	4,350,549	4,618,884
Currency fluctuation loss on L/T debt			0	8,415,440	6,868,441	1,901,394	1,065,294	942,434	827,616	773,092	709,833
Changes in assets and liabilities:											
Accounts receivable		(1,742,404)	(3,556,549)	(12,242,946)	(15,153,212)	(1,277,385)	(1,391,876)	(1,414,940)	(1,341,508)	(1,575,088)	(1,579,143)
Materials and supplies		(84,976)	(307,434)	(229,384)	(181,163)	(93,985)	(55,940)	(59,466)	(62,992)	(66,995)	(71,093)
Other assets		(24,695)	(89,344)	(66,662)	(52,648)	(27,307)	(16,257)	(17,282)	(18,306)	(19,470)	(20,661)
Accounts payable		3,551,117	7,019,593	23,877,622	29,249,876	2,555,598	2,789,496	2,836,473	2,690,578	3,111,608	3,119,170
Other funds		822,625	2,976,177	2,220,601	1,753,786	909,644	541,542	575,677	609,812	646,559	688,229
Net cash provided by operations		2,628,340	3,913,394	14,673,846	22,598,364	11,696,735	13,524,301	11,254,850	10,272,215	11,017,467	11,540,538
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(577,166)	(4,527,494)	(11,277,024)	(5,774,446)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(4,734,831)	(10,393,858)	(14,610,707)	(7,361,951)	0	0	0	0	0
Net cash used in investing activities		0	(5,311,997)	(14,921,353)	(25,887,731)	(13,136,397)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	4,734,831	10,393,858	14,610,707	7,361,951	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(3,091,779)	(3,091,779)	(3,091,779)	(3,091,779)
Loss on Currency Fluctuation		0	0	0	0	0	0	(1,432,750)	(1,570,686)	(1,604,991)	(1,802,753)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(3,478,287)	(2,266,017)	(1,734,712)	(1,897,606)	(2,037,662)
Net cash provided (used in) financing activities		0	4,734,831	10,393,858	14,610,707	7,361,951	(3,478,287)	(6,790,546)	(6,397,177)	(6,684,376)	(6,932,195)
Net increase (decrease) in cash and cash equivalents		2,628,340	3,336,229	10,146,351	11,321,339	5,922,289	10,046,014	4,464,304	3,875,038	4,333,091	4,608,343
Cash and cash equivalents–beginning		76,824	2,705,164	6,041,393	16,187,744	27,509,083	33,431,372	43,477,386	47,941,690	51,816,728	56,149,819
Cash and cash equivalents–ending		2,705,164	6,041,393	16,187,744	27,509,083	33,431,372	43,477,386	47,941,690	51,816,728	56,149,819	60,758,162

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	293,943	310,999	2,871,046	17,445,036	42,302,546	80,314,074	102,729,786	109,064,070	115,797,619	122,930,433	130,516,467
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	293,943	2,871,046	12,133,039	27,381,193	54,426,342	69,593,389	109,064,070	115,797,619	122,930,433	130,516,467	138,566,511
New Investments (Current Year)	0	0	5,311,997	14,921,353	25,887,731	13,136,397	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	17,056										
Ending Value of Assets (Gross)	310,999	2,871,046	17,445,036	42,302,546	80,314,074	102,729,786	109,064,070	115,797,619	122,930,433	130,516,467	138,566,511
Accumulated Depreciation		212,548	2,057,876	9,278,095	15,972,696	23,227,566	29,335,556	34,779,845	40,787,052	47,307,103	54,672,526
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	212,548	1,962,177	8,696,594	14,562,613	20,550,431	25,911,229	31,144,376	36,927,132	43,299,422	50,321,977	58,044,639
Current Depreciation		95,702	581,501	1,410,085	2,677,136	3,424,326	3,635,469	3,859,921	4,097,681	4,350,549	4,618,884
Net Value of Assets	98,451	813,167	8,166,941	26,329,848	57,086,507	73,394,230	74,284,225	75,010,567	75,533,330	75,843,941	75,902,988
Accum. Revaluation Surplus		2,560,047	11,822,040	21,758,193	33,881,994	43,161,309	49,495,593	56,229,142	63,361,956	70,947,990	78,998,034
Accum. Reevaluated Depreciation		1,749,629	8,388,344	13,672,863	18,250,595	20,934,258	22,743,079	24,890,365	27,402,735	30,327,609	33,699,722
Net Reevaluation Surplus		810,418	3,433,696	8,085,335	15,631,399	22,227,051	26,752,514	31,338,777	35,959,221	40,620,381	45,298,312

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	106,062	103,440	100,677	97,828	94,923	91,970	88,962	85,974	82,954	82,159	81,360
Other	2,049,100	2,003,059	1,957,995	1,949,164	1,966,249	1,978,951	1,999,635	2,016,480	2,024,266	2,041,704	2,056,137
Total	2,155,162	2,106,499	2,058,672	2,046,992	2,061,172	2,070,921	2,088,597	2,102,453	2,107,220	2,123,863	2,137,497
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Natural Gas – Sales											
Residential	104,577	101,992	100,677	97,828	94,923	91,970	88,982	85,974	82,954	82,159	81,360
Other	2,020,413	1,975,016	1,930,583	1,921,876	1,938,722	1,951,246	1,971,620	1,988,258	1,995,926	2,013,120	2,027,351
Total	2,124,990	2,077,008	2,031,260	2,019,704	2,033,645	2,043,216	2,060,602	2,074,232	2,078,880	2,095,279	2,108,711
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,612	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,867
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,464	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,600	31,437	100,845	183,464	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	173,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.50%	663.50%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,960	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		1.3%	−33.2%	−25.5%	−4.5%	5.9%	9.4%	6.0%	4.6%	5.0%	5.4%
Average over Period 1998–2002							6.1%				
External Financing		0.0%	93.3%	77.7%	66.6%	64.6%	64.6%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993–US$ x 000)			39.00	900.00	1994.00	941.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			39	932	2,132	1,041	0	0	0	0	0
Duties on Foreign Suppliers			236,742	519,693	730,535	368,098	0	0	0	0	0
Domestic Supplier (Current–Rubles x 000)			340,424	4,007,601	10,546,489	5,406,349	0	0	0	0	0
Foreign Supplier (1993–US$ x 000)			1781.00	2714.00	2968.00	1375.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			1,602	2,812	3,173	1,521	0	0	0	0	0
Foreign Supplier (Current–Rubles x 000)			4,734,831	10,393,658	14,610,707	7,361,951	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		106,673	(2,129,049)	(5,300,825)	113,284	7,728,757	10,592,042	8,391,954	7,567,105	8,145,762	8,694,208
Less Retirements			0	0	0	0	0	(3,091,779)	(3,091,779)	(3,091,779)	(3,091,779)
Less Domestic Suppliers		0	(577,166)	(4,527,494)	(11,277,024)	(5,774,448)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(3,478,287)	(2,266,017)	(1,734,712)	(1,897,606)	(2,037,662)
Funds Available/(Required)		106,673	(2,706,214)	(9,828,319)	(11,163,741)	1,954,310	7,113,756	3,034,159	2,740,614	3,156,376	3,564,767
External Sources (Foreign Projects)		0	4,734,831	10,393,658	14,610,707	7,361,951	0	0	0	0	0
Accumulative Long–Term Debt			4,734,831	15,128,690	29,739,397	37,101,348	37,101,348	34,009,569	30,917,790	27,826,011	24,734,232
Retirements								3,091,779	3,091,779	3,091,779	3,091,779
Interest			236,742	993,176	2,243,404	3,342,037	3,710,135	3,555,546	3,246,368	2,937,190	2,628,012
Memo: Total Project		0	5,075,255	19,476,915	44,634,111	57,402,411	57,402,411	57,402,411	57,402,411	57,402,411	57,402,411
Memo: % Externally Financed		0.0%	93.3%	77.7%	66.6%	64.6%	64.6%				
Computation of ending retained earnings:											
Beginning retained earnings		0	10,971	(2,699,578)	(9,410,489)	(11,974,341)	(7,669,910)	(4,191,623)	(1,925,607)	(190,895)	1,706,712
adjusted net income		10,971	(2,710,550)	(6,710,910)	(2,563,852)	4,304,431	6,956,573	4,532,034	3,469,424	3,795,213	4,075,325
less: dividends		0	0	0	0	0	(3,478,287)	(2,266,017)	(1,734,712)	(1,897,606)	(2,037,662)
Ending retained earnings – to B/S		10,971	(2,699,578)	(9,410,489)	(11,974,341)	(7,669,910)	(4,191,623)	(1,925,607)	(190,895)	1,706,712	3,744,374

RYAZAN

Case-R-1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			5,075,255								
VAT Payment			1,015,051								
VAT Recapture				(507,526)	(507,526)						
1995 Investment				14,401,660							
VAT Payment				2,880,332							
VAT Recapture					(1,440,166)	(1,440,166)					
1996 Investment					25,157,196						
VAT Payment					5,031,439						
VAT Recapture						(2,515,720)	(2,515,720)				
1998 Investment						12,766,300					
VAT Payment						2,553,660					
VAT Recapture							(1,276,830)	(1,276,830)			
Value Added Tax on Projects		0	1,015,051	2,880,332	5,031,439	2,553,660	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(507,526)	(1,947,691)	(3,955,886)	(3,792,550)	(1,276,830)	0	0	0
Net V.A.T. on Projects		0	1,015,051	2,372,806	3,083,748	(1,402,226)	(3,792,550)	(1,276,830)	0	0	0
On Sales											
(a) GAS & LPG Purchases		19,088,992	54,577,207	175,292,783	323,168,299	336,088,366	350,190,936	364,530,994	378,133,465	393,864,493	409,633,751
(b) Commodity = = Purchases / (1 + VAT Rate)		15,907,493	45,481,006	146,077,319	269,306,916	280,073,638	291,825,780	303,775,828	315,111,221	328,220,411	341,361,459
(c) VAT included = Line (b) – Line (b)		3,181,499	9,096,201	29,215,464	53,861,383	56,014,728	58,365,156	60,755,166	63,022,244	65,644,082	68,272,292
(d) GAS & LPG Sales		21,544,036	61,953,186	201,056,282	373,225,529	387,739,048	403,553,422	419,629,825	434,872,920	452,768,914	470,711,026
(e) Commodity = = Purchases / (1 + VAT Rate)		17,953,364	51,627,655	167,546,902	311,021,274	323,115,874	336,294,518	349,691,521	362,394,100	377,307,428	392,259,189
(f) VAT included = Line (d) – Line (e)		3,590,673	10,325,531	33,509,380	62,204,255	64,623,175	67,258,904	69,938,304	72,478,820	75,461,486	78,451,838
(g) Utility's VAT Liability = Line (f) – Line (c)		409,174	1,229,330	4,293,917	8,342,872	8,608,447	8,893,748	9,183,139	9,456,576	9,817,404	10,179,546
Test											
Margin on GAS & LPG Sales		2,455,045	7,375,979	25,763,499	50,057,230	51,650,682	53,362,486	55,098,832	56,739,455	58,904,421	61,077,275
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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Case–R–1

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			15,128,690	29,739,397	37,101,348	37,101,348	34,009,569	30,917,790	27,826,011	24,734,232
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000172968
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			1,715	1,492	393	214	184	157	143	128
Additional ruble debt/expense to record – in rubles			6,415,440	6,868,441	1,901,394	1,065,294	942,434	827,616	773,092	709,833
cumulative			6,415,440	13,283,881	15,185,275	16,250,569	17,193,002	18,020,618	18,793,710	19,503,542
Computation of payment on additional L/T debt – 1/12th							1,432,750	1,570,686	1,694,991	1,802,753
cumulative							1,432,750	3,003,436	4,698,427	6,501,181

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Case–R–1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	17.2%	9.8%	14.1%	6.8%	4.4%	4.0%	3.9%	4.0%	4.0%	4.1%	4.2%
Short–Term Investments	5.2%	39.0%	15.8%	19.7%	18.8%	19.5%	24.2%	25.8%	27.0%	28.3%	29.6%
Cash & Investments	22.4%	48.9%	29.9%	26.5%	23.2%	23.5%	28.1%	29.7%	31.0%	32.4%	33.8%
Accounts receivable	44.9%	34.2%	27.0%	29.0%	27.7%	24.0%	23.0%	22.9%	22.9%	23.0%	23.1%
Materials & equipment	3.0%	1.7%	2.0%	1.0%	0.7%	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%
Other assets	0.9%	0.5%	0.6%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total Current Assets	71.2%	85.3%	59.5%	56.9%	51.8%	48.4%	51.9%	53.5%	54.8%	56.2%	57.8%
Fixed assets											
Adusted Cost of Fixed Assets	90.8%	51.8%	86.4%	69.3%	67.8%	72.3%	70.6%	71.8%	73.6%	75.3%	77.1%
Less: Accumulated Depreciation	62.1%	37.2%	46.0%	26.2%	19.6%	20.6%	22.5%	25.3%	28.4%	31.5%	34.9%
Net Revalued Assets	28.8%	14.7%	40.5%	43.1%	48.2%	51.6%	48.1%	46.5%	45.2%	43.8%	42.2%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	65.6%	68.2%	53.5%	56.8%	53.9%	46.8%	44.8%	44.7%	44.8%	44.9%	45.1%
Total Current Liabilities	65.6%	68.2%	53.5%	56.8%	53.9%	46.8%	44.8%	44.7%	44.8%	44.9%	45.1%
Long Term Debt	0.0%	0.0%	23.5%	24.8%	25.1%	26.1%	24.0%	21.1%	18.5%	16.1%	13.8%
Additional debt due to currency rate	0.0%	0.0%	0.0%	10.5%	11.2%	10.7%	10.5%	9.8%	9.0%	8.1%	7.2%
Other Funds	29.2%	16.7%	19.3%	10.0%	6.6%	6.2%	6.0%	6.1%	6.3%	6.4%	6.6%
Total Long Term Liabilities	29.2%	16.7%	42.8%	45.3%	43.0%	43.0%	40.6%	37.0%	33.8%	30.6%	27.6%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	14.6%	17.0%	13.2%	13.2%	15.6%	17.3%	19.4%	21.5%	23.4%	25.2%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	5.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	0.2%	−13.4%	−15.4%	−10.1%	−5.4%	−2.7%	−1.2%	−0.1%	1.0%	2.1%
Net Equity	5.2%	15.2%	3.7%	−2.1%	3.1%	10.3%	14.6%	18.3%	21.4%	24.4%	27.3%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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RYAZAN

Case–R–1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	243,908	4,724,323	12,013,879	34,699,222	61,407,585	68,728,531	80,238,621	86,194,612	91,492,546	97,487,191	103,766,435
Current liabilities	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Working capital	19,210	948,508	1,218,471	26,192	(2,515,321)	2,250,027	10,970,619	14,090,138	16,697,494	19,580,531	22,740,605
Change in working capital		929,297	269,963	(1,192,278)	(2,541,513)	4,765,348	8,720,592	3,119,519	2,607,356	2,883,037	3,160,074
Current ratio	1.09	1.25	1.11	1.00	0.96	1.03	1.16	1.20	1.22	1.25	1.28
Capitalization Table:											
Debt	99,934	922,559	8,633,568	27,663,466	50,896,401	61,069,389	62,676,225	59,869,807	56,444,769	53,079,650	49,583,180
Equity	17,727	839,116	751,844	(1,307,427)	3,674,785	14,574,868	22,578,618	29,430,898	35,786,053	42,344,819	49,060,413
Percent debt	84.9%	52.4%	92.0%	105.0%	93.3%	80.7%	73.5%	67.0%	61.2%	55.6%	50.3%
Percent equity	15.1%	47.6%	8.0%	−5.0%	6.7%	19.3%	26.5%	33.0%	38.8%	44.4%	49.7%
Times Interest Earned:											
Net income	57,263	10,971	(2,710,550)	(6,710,910)	(2,563,852)	4,304,431	6,956,573	4,532,034	3,469,424	3,795,213	4,075,325
Add back: interest expense	0	0	236,742	993,176	2,243,404	3,342,037	3,710,135	3,555,546	3,246,368	2,937,190	2,628,012
depreciation	0	95,702	581,501	1,410,085	2,677,136	3,424,326	3,635,469	3,859,921	4,097,681	4,350,549	4,618,884
taxes	47,893	597,289	1,889,647	14,548,805	24,154,894	21,112,871	21,251,643	21,525,176	21,551,596	21,789,809	22,016,872
total	105,156	703,992	(2,661)	10,241,156	26,511,561	32,183,665	35,553,820	33,472,676	32,365,069	32,872,761	33,339,092
Interest	0	0	236,742	993,176	2,243,404	3,342,037	3,710,135	3,555,546	3,246,368	2,937,190	2,628,012
Time interest earned			−0.0	10.3	11.8	9.6	9.6	9.4	10.0	11.2	12.7
Operating revenue	1,747,019	21,544,036	61,953,186	201,056,282	373,225,529	387,739,048	403,553,422	419,629,825	434,872,920	452,768,914	470,711,026
Operating expenses (B4 depr. tax)	1,258,443	20,219,514	59,354,792	182,791,533	332,816,172	346,850,933	361,617,119	376,662,623	391,012,369	407,538,153	424,150,780
Operating margin	488,576	1,324,523	2,598,395	18,264,749	40,409,358	40,888,116	41,936,303	42,967,203	43,860,552	45,230,761	46,560,246
Percent	28.0%	6.1%	4.2%	9.1%	10.8%	10.5%	10.4%	10.2%	10.1%	10.0%	9.9%
Net income to total revenue	3.3%	0.1%	−4.4%	−3.3%	−0.7%	1.1%	1.7%	1.1%	0.8%	0.8%	0.9%
Return on total assets	16.7%	0.2%	−13.4%	−11.0%	−2.2%	3.0%	4.5%	2.8%	2.1%	2.2%	2.3%
Return on beginning equity		61.9%	−323.0%	−892.6%	196.1%	117.1%	47.7%	20.1%	11.8%	10.6%	9.6%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum. Deprec. / Assets	68.3%	71.7%	53.2%	37.8%	28.9%	28.6%	31.9%	35.2%	38.6%	41.9%	45.2%
Receivables / Sales	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case–R–1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		2,628,340	3,336,229	10,146,351	11,321,339	5,922,289	10,046,014	4,464,304	3,875,037	4,333,091	4,608,343
Accounts receivable		1,742,404	3,556,549	12,242,946	15,153,212	1,277,385	1,391,878	1,414,940	1,341,598	1,575,088	1,579,148
Materials & equipment		84,976	307,434	229,384	181,163	93,965	55,940	59,466	62,992	66,995	71,093
Other assets		24,695	89,344	66,662	52,648	27,307	16,257	17,282	18,306	19,470	20,661
Net fixed assets		714,716	7,353,774	18,162,907	30,756,659	16,307,723	889,995	726,342	522,763	310,611	59,048
		5,195,131	14,643,330	40,848,250	57,465,021	23,628,669	12,400,084	6,682,334	5,820,696	6,305,255	6,338,293
Credits:											
Accounts payable		3,551,117	7,019,593	23,877,622	29,249,876	2,555,596	2,789,498	2,836,473	2,690,578	3,111,608	3,119,170
Long term debt		0	4,734,831	10,393,858	14,610,707	7,361,951	0	(3,091,779)	(3,091,779)	(3,091,779)	(3,091,779)
Currency fluctuation on L/T debt			0	6,415,440	6,868,441	1,901,394	1,065,294	(490,316)	(743,070)	(921,899)	(1,092,921)
Other funds		822,625	2,976,177	2,220,601	1,753,786	909,644	541,542	575,677	609,812	648,559	688,229
Equity/retained earnings		821,389	(87,272)	(2,059,271)	4,982,212	10,900,083	8,003,750	6,852,280	6,355,156	6,558,766	6,715,594
		5,195,131	14,643,329	40,848,250	57,465,022	23,628,670	12,400,084	6,682,335	5,820,697	6,305,255	6,338,293
check: net change debits and credits		0	(1)	0	1	1	0	1	1	0	0
Does balance sheet balance?		1	0	(0)	(1)	(1)	(1)	(1)	(1)	(2)	(0)
check: analysis of change in fixed assets		(0)	0	0	(0)	(0)	0	0	0	0	0
check: analysis of change in equity/RE		(0)	(0)	(0)	0	0	(0)	0	0	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	(0)	0	0	0	0	(0)	0	(0)	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		2,560,047	9,261,993	9,936,157	12,123,796	9,279,315	6,334,284	6,733,549	7,132,814	7,586,034	8,050,044
Revaluation of accum depreciation		(1,749,629)	(6,636,715)	(5,284,516)	(4,577,732)	(2,683,663)	(1,808,821)	(2,147,286)	(2,512,370)	(2,924,874)	(3,372,113)
Current depreciation		(95,702)	(581,501)	(1,410,085)	(2,677,136)	(3,424,326)	(3,635,469)	(3,859,921)	(4,097,681)	(4,350,549)	(4,618,884)
New capital expenditures, net		0	5,311,997	14,921,353	25,887,731	13,136,397	0	0	0	0	0
		714,716	7,353,774	18,162,907	30,756,659	16,307,723	889,995	726,342	522,763	310,611	59,048
Analysis of change in net equity/RE											
Net income		10,971	(2,710,550)	(6,710,910)	(2,563,852)	4,304,431	6,956,573	4,532,034	3,469,424	3,795,213	4,075,325
Revaluation surplus (direct cr. to equity)		2,560,047	9,261,993	9,936,157	12,123,796	9,279,315	6,334,284	6,733,549	7,132,814	7,586,034	8,050,044
Revaluation of accum depreciation		(1,749,629)	(6,636,715)	(5,284,516)	(4,577,732)	(2,683,663)	(1,808,821)	(2,147,286)	(2,512,370)	(2,924,874)	(3,372,113)
Dividends declared		0	0	0	0	0	(3,478,287)	(2,266,017)	(1,734,712)	(1,897,606)	(2,037,662)
		821,389	(87,272)	(2,059,271)	4,982,212	10,900,083	8,003,750	6,852,280	6,355,156	6,558,766	6,715,594
Analysis of change in long term debt:											
New debt issued		0	4,734,831	10,393,858	14,610,707	7,361,951	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(3,091,779)	(3,091,779)	(3,091,779)	(3,091,779)
		0	4,734,831	10,393,858	14,610,707	7,361,951	0	(3,091,779)	(3,091,779)	(3,091,779)	(3,091,779)

RYAZAN

Case–R–2

INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		203,984	1,210,702	7,179,206	17,416,852	17,448,824	17,422,142	17,388,671	17,348,336	17,749,055	18,156,460
Natural Gas, Other		21,330,175	60,907,177	195,187,499	359,512,518	375,452,521	391,512,619	407,844,983	423,338,797	441,075,440	458,851,645
Natural Gas, Total		21,534,158	62,126,879	202,366,705	376,929,370	392,901,345	408,934,761	425,233,654	440,687,133	458,824,495	477,008,106
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	1,747,019	21,544,036	62,168,624	202,432,226	377,013,669	392,995,384	409,034,598	425,339,655	440,799,664	458,943,970	477,134,949
Other Revenues	2,245	18,480	78,097	122,579	157,710	175,931	186,779	198,310	210,526	223,517	237,303
TOTAL OPERATING INCOME	**1,749,264**	**21,562,517**	**62,246,721**	**202,554,805**	**377,171,379**	**393,171,315**	**409,221,377**	**425,537,966**	**441,010,189**	**459,167,487**	**477,372,253**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		74,477	439,093	2,584,514	6,270,067	6,281,577	6,271,971	6,259,922	6,245,401	6,389,660	6,536,323
Natural Gas, Other		18,988,999	54,030,285	172,539,023	316,680,481	329,563,879	343,661,07[illegible]	357,997,263	371,597,389	387,166,220	402,769,777
Natural Gas, Total		19,063,476	54,469,377	175,123,537	322,950,548	335,845,456	349,933,048	364,257,184	377,842,790	393,555,880	409,306,103
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,135,982	19,088,992	54,577,207	175,292,783	323,168,299	336,088,366	350,190,936	364,530,994	378,133,465	392,864,493	409,633,751
Payroll (Wages & Bonus)	70,050	646,680	2,732,869	4,289,427	5,518,765	6,156,391	6,535,992	6,939,520	7,366,976	7,821,591	8,304,014
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	52,411	483,842	2,044,716	3,209,324	4,129,108	4,606,176	4,890,191	5,192,108	5,511,928	5,852,069	6,213,015
TOTAL OPERATING EXPENSES	**1,258,443**	**20,219,514**	**59,354,792**	**182,791,533**	**332,816,172**	**346,850,933**	**361,617,119**	**376,662,623**	**391,012,369**	**407,538,153**	**424,150,780**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**490,821**	**1,343,003**	**2,891,929**	**19,763,271**	**44,355,207**	**46,320,382**	**47,604,258**	**48,875,343**	**49,997,821**	**51,629,334**	**53,221,472**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	**0**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		95,702	612,931	1,538,053	2,726,489	3,460,571	3,673,948	3,900,776	4,141,053	4,396,597	4,667,772
Value Added Tax (on Sales)	385,665	409,174	1,265,236	4,523,241	8,974,228	9,484,503	9,807,277	10,134,777	10,444,366	10,846,580	11,250,200
Net Value Added Tax (on Projects)		0	1,199,690	2,724,696	2,062,122	(1,379,097)	(3,384,765)	(1,222,646)	0	0	0
Gas Rehabilitation Fund		245,504	759,142	2,713,944	5,384,537	5,690,702	5,884,366	6,080,866	6,266,620	6,507,948	6,750,120
TOTAL DEDUCTIONS	**385,665**	**750,380**	**3,836,999**	**11,499,934**	**19,147,376**	**17,256,678**	**15,980,827**	**18,893,773**	**20,852,039**	**21,751,124**	**22,666,091**
NET INCOME BEFORE INTEREST and TAXES	**105,156**	**608,261**	**(678,965)**	**8,367,062**	**25,341,263**	**29,212,575**	**31,781,482**	**30,149,379**	**29,323,927**	**30,067,349**	**30,754,185**
INTEREST and TAXES											
Interest Expenses		0	256,447	1,170,649	2,636,225	3,789,658	4,135,268	3,982,965	3,618,360	3,273,754	2,929,148
Currency fluctuation loss on debt			0	10,395,448	7,954,176	2,119,269	1,187,363	1,050,425	922,450	861,678	801,379
Taxes:											
Corporate Income Tax	33,396	429,761	925,417	6,324,247	14,193,666	14,822,522	15,233,363	15,640,110	15,999,303	16,521,387	17,030,871
Excess Payroll Tax	14,497	126,103	532,909	836,438	1,076,159	1,200,496	1,274,518	1,353,206	1,436,560	1,525,210	1,619,263
Property Tax		31,606	234,014	320,621	829,315	1,412,317	1,608,162	1,747,830	1,820,131	1,884,408	1,954,099
Road Tax		9,820	30,366	108,558	215,361	227,628	235,375	243,235	250,665	260,318	270,005
TOTAL INTEREST and TAXES	**47,893**	**597,289**	**1,979,154**	**19,155,960**	**26,904,923**	**23,571,890**	**23,674,048**	**23,997,771**	**24,047,468**	**24,326,756**	**24,604,785**
NET INCOME	**57,263**	**10,971**	**(2,658,139)**	**(10,788,898)**	**(1,563,640)**	**5,640,685**	**8,107,434**	**6,151,608**	**5,276,459**	**5,740,593**	**6,149,400**
Memo: Weighted Ave Cost of Gas		9,050	26,459	85,552	156,683	162,172	167,545	173,253	179,309	185,302	191,489
Memo: Weighted Ave Sales Price of Gas		10,368	30,483	99,524	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,190	3,757	13,398	26,276	27,551	28,249	29,002	29,823	30,731	31,673
Memo: Cash Flow From Natural Gas		2,470,682	7,657,502	27,243,168	53,978,822	57,055,889	59,001,713	60,976,470	62,844,344	65,268,616	67,702,002
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	58,981	544,494	2,845,527	4,156,124	5,191,208	5,728,079	6,047,697	6,387,461	6,747,372	7,130,151	7,536,344
Short–Term Investments	17,843	2,160,670	2,511,958	11,677,680	28,891,393	35,852,541	46,295,127	50,544,424	54,252,626	58,444,607	62,942,775
Cash & Short Term Investments	76,824	2,705,164	5,357,484	15,833,804	34,082,600	41,580,620	52,342,824	56,931,885	60,999,998	65,574,758	70,479,119
Accounts receivable – Gross *(See Note C)*	153,761	1,896,165	5,471,676	17,816,762	33,162,280	34,586,886	36,00[illegible].553	37,435,618	38,796,307	40,393,250	41,994,301
Materials & equipment	10,323	95,299	402,732	632,116	813,279	907,244	963,184	1,022,650	1,085,643	1,152,638	1,223,731
Other assets	3,000	27,695	117,039	183,701	236,350	263,657	279,914	297,196	315,502	334,972	355,632
Total Current Assets	243,908	4,724,323	11,348,932	34,466,384	68,314,509	77,340,407	89,566,475	95,687,349	101,197,450	107,455,618	114,052,784
Fixed assets											
Adusted Cost of Fixed Assets	310,999	2,871,046	18,387,935	46,141,599	81,794,668	103,817,119	110,218,447	117,023,267	124,231,577	131,897,904	140,033,153
Less: Accumulated Depreciation	212,548	2,057,878	9,300,525	16,149,996	23,505,033	29,681,325	35,185,414	41,258,515	47,940,978	55,296,012	63,374,352
Net Revalued Assets	98,451	813,167	9,070,410	29,991,601	58,289,635	74,135,794	75,033,034	75,764,752	76,290,599	76,601,893	76,658,802
TOTAL ASSETS	342,359	5,537,490	20,427,343	64,457,985	126,604,145	151,476,201	164,619,509	171,452,101	177,488,049	184,057,511	190,711,585
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Total Current Liabilities	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Long Term Debt		0	5,128,943	18,284,029	34,440,478	41,352,680	41,352,680	37,906,623	34,460,567	31,014,510	27,568,453
Additional debt due to currency rate			0	10,395,448	18,349,624	20,488,892	21,856,255	20,814,456	19,690,941	18,368,106	16,861,458
Other Funds	99,934	922,559	3,898,736	6,119,337	7,873,120	8,782,766	9,324,309	9,899,986	10,509,798	11,158,357	11,846,586
Total Long Term Liabilities	99,934	922,559	9,027,679	34,798,813	60,663,224	70,604,339	72,333,244	68,621,066	64,361,306	60,540,973	56,276,497
Other Liabilities & Equity											
Net Revaluation Surplus		810,418	3,433,696	8,604,480	17,199,992	23,934,651	28,505,840	33,138,333	37,805,233	42,513,124	47,237,804
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727
Retained Earnings	0	10,971	(2,847,167)	(13,636,065)	(15,199,705)	(9,559,021)	(5,505,304)	(2,429,500)	208,730	3,079,027	6,153,727
Net Equity	17,727	839,116	604,256	(5,013,858)	2,018,014	14,393,358	23,018,263	30,726,561	38,031,690	45,609,877	53,409,258
TOTAL LIABILITIES & EQUITY	342,359	5,537,491	20,427,343	64,457,985	126,604,144	151,476,200	164,619,508	171,452,101	177,488,048	184,057,510	190,711,586

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		10,971	(2,858,139)	(10,788,898)	(1,563,640)	5,640,685	8,107,434	6,151,608	5,276,459	5,740,593	6,149,400
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		95,702	612,931	1,538,053	2,726,489	3,480,571	3,673,948	3,900,776	4,141,053	4,396,597	4,667,772
Currency fluctuation loss on L/T debt			0	10,395,448	7,954,176	2,119,269	1,187,363	1,050,425	922,450	861,678	801,379
Changes in assets and liabilities:											
Accounts receivable		(1,742,404)	(3,575,511)	(12,345,086)	(15,365,518)	(1,406,606)	(1,411,667)	(1,435,065)	(1,360,689)	(1,598,943)	(1,601,051)
Materials and supplies		(84,876)	(307,434)	(229,384)	(181,163)	(93,985)	(55,940)	(59,466)	(62,992)	(66,995)	(71,093)
Other assets		(24,695)	(89,344)	(66,662)	(52,648)	(27,307)	(16,257)	(17,282)	(18,306)	(19,470)	(20,661)
Accounts payable		3,551,117	7,019,593	23,877,622	29,249,876	2,555,596	2,789,498	2,836,473	2,690,578	3,111,008	3,119,170
Other funds		822,625	2,976,177	2,220,601	1,753,786	909,644	541,542	575,677	609,812	648,559	688,229
Net cash provided by operations		2,628,340	3,778,274	14,601,694	24,521,358	13,157,888	14,815,921	13,003,145	12,196,365	13,075,627	13,733,145
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,125,954)	(4,125,374)	(6,272,562)	(5,659,868)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(5,128,943)	(13,155,086)	(16,156,449)	(6,912,202)	0	0	0	0	0
Net cash used in investing activities		0	(6,254,896)	(17,280,460)	(22,429,011)	(12,572,070)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	5,128,943	13,155,086	16,156,449	6,912,202	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(3,446,057)	(3,446,057)	(3,446,057)	(3,446,057)
Loss on Currency Fluctuation		0	0	0	0	0	0	(1,892,223)	(2,045,965)	(2,184,514)	(2,308,027)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(4,053,717)	(3,075,804)	(2,638,230)	(2,870,297)	(3,074,700)
Net cash provided (used in) financing activities		0	5,128,943	13,155,086	16,156,449	6,912,202	(4,053,717)	(8,414,084)	(8,130,251)	(8,500,867)	(8,828,784)
Net increase (decrease) in cash and cash equivalents		2,628,340	2,652,320	10,470,320	18,248,796	7,498,020	10,762,204	4,589,061	4,066,113	4,574,760	4,904,361
Cash and cash equivalents–beginning		76,824	2,705,164	5,357,484	15,833,804	34,082,600	41,580,620	52,342,824	56,931,885	60,999,998	65,574,758
Cash and cash equivalents–ending		2,705,164	5,357,484	15,833,804	34,082,600	41,580,620	52,342,824	56,931,885	60,999,998	65,574,758	70,479,119

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	293,943	310,999	2,871,046	18,387,935	46,141,599	81,794,668	103,817,119	110,218,447	117,023,267	124,231,577	131,897,904
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	293,943	2,871,046	12,133,039	28,861,139	59,365,658	91,245,048	110,218,447	117,023,267	124,231,577	131,897,904	140,033,153
New Investments (Current Year)	0	0	6,254,896	17,280,460	22,429,011	12,572,070	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	17,056										
Ending Value of Assets (Gross)	310,999	2,871,046	18,387,935	46,141,599	81,794,668	103,817,119	110,218,447	117,023,267	124,231,577	131,897,904	140,033,153
Accumulated Depreciation		212,548	2,057,870	9,309,525	16,149,996	23,505,033	29,681,325	35,185,414	41,255,515	47,940,978	55,298,012
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	212,548	1,962,177	8,696,594	14,611,945	20,778,544	28,220,754	31,511,465	37,357,740	43,799,928	50,899,415	58,706,580
Current Depreciation		95,702	612,931	1,538,053	2,726,489	3,460,571	3,673,948	3,900,776	4,141,053	4,396,597	4,667,772
Net Value of Assets	98,451	813,167	9,078,410	29,991,601	58,289,635	74,135,794	75,033,034	75,764,752	76,290,599	76,601,893	76,658,802
Accum. Revaluation Surplus		2,560,047	11,822,040	22,295,244	35,519,303	44,969,683	51,371,011	58,175,831	65,384,141	73,050,468	81,185,717
Accum. Reevaluated Depreciation		1,749,629	6,388,344	13,690,764	18,319,310	21,035,031	22,865,172	25,037,498	27,578,908	30,537,345	33,947,913
Net Reevaluation Surplus		810,418	3,433,696	8,604,480	17,199,992	23,934,651	28,505,840	33,138,333	37,805,233	42,513,124	47,237,804

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	106,062	103,440	100,677	97,828	94,923	91,970	88,962	85,974	82,954	82,159	81,360
Other	2,049,100	2,003,059	1,957,995	1,949,164	1,966,249	1,978,951	1,999,615	2,016,489	2,024,266	2,041,704	2,056,137
Total	2,155,162	2,106,499	2,058,672	2,046,992	2,061,172	2,070,921	2,088,597	2,102,463	2,107,220	2,123,863	2,137,497
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.1%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	104,577	101,992	100,677	97,828	94,923	91,970	88,962	85,974	82,954	82,159	81,360
Other	2,020,413	1,975,016	1,937,436	1,935,520	1,959,367	1,978,951	1,999,615	2,016,489	2,024,266	2,041,704	2,056,137
Total	2,124,990	2,077,008	2,038,113	2,033,348	2,054,290	2,070,921	2,088,597	2,102,463	2,107,220	2,123,863	2,137,497
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,612	75,288	77,772	80,336
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,867
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,066	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		719	2,385	3,741	4,605	4,841	4,960	5,118	5,255	5,401	5,558
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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Case–R–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		1.3%	−31.5%	−36.0%	−2.7%	7.6%	10.8%	8.1%	6.9%	7.5%	8.0%
Average over Period 1993–2002							8.3%				
External Financing		0.0%	85.5%	80.8%	77.8%	73.2%	73.2%				

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Case–R–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993–US$ x 000)			254.00	725.00	946.00	928.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			257	751	1,011	1,026	0	0	0	0	0
Duties on Foreign Suppliers			256,447	657,754	807,822	345,610	0	0	0	0	0
Domestic Supplier (Current–Rubles x 000)			869,507	3,467,619	5,464,739	5,314,258	0	0	0	0	0
Foreign Supplier (1993–US$ x 000)			2125.00	3435.00	3282.00	1[illegible]21.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			2,151	3,559	3,508	1,428	0	0	0	0	0
Foreign Supplier (Current–Rubles x 000)			5,128,943	13,155,086	16,156,449	6,912,202	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		106,673	(2,245,207)	(9,250,845)	1,162,849	9,101,255	11,781,382	10,052,384	9,417,512	10,137,190	10,817,172
Less Retirements			0	0	0	0	0	(3,446,057)	(3,446,057)	(3,446,057)	(3,446,057)
Less Domestic Suppliers		0	(1,125,954)	(4,125,374)	(6,272,562)	(5,659,868)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(4,053,717)	(3,075,804)	(2,638,230)	(2,870,297)	(3,074,700)
Funds Available/(Required)		106,673	(3,371,161)	(13,376,219)	(5,109,713)	3,441,388	7,727,665	3,530,523	3,333,226	3,820,837	4,296,415
External Sources (Foreign Projects)		0	5,128,943	13,155,086	16,156,449	6,912,202	0	0	0	0	0
Accumulative Long–Term Debt			5,128,943	18,284,029	34,440,478	41,352,680	41,352,680	37,906,623	34,460;567	31,014,510	27,568,453
Retirements								3,446,057	3,446,057	3,446,057	3,446,057
Interest			256,447	1,170,649	2,636,225	3,789,658	4,135,268	3,962,965	3,618,360	3,273,754	2,929,148
Memo: Total Project		0	5,998,449	22,621,155	44,242,343	56,468,803	56,468,803	56,468,803	56,468,803	56,468,803	56,468,803
Memo: % Externally Financed		0.0%	85.5%	80.8%	77.8%	73.2%	73.2%				
Computation of ending retained earnings:											
Beginning retained earnings		0	10,971	(2,847,167)	(13,636,065)	(15,199,705)	(9,559,021)	(5,505,304)	(2,429,500)	208,730	3,079,027
adjusted net income		10,971	(2,858,139)	(10,788,898)	(1,563,640)	5,640,685	8,107,434	6,151,608	5,276,459	5,740,593	6,149,400
less: dividends		0	0	0	0	0	(4,053,717)	(3,075,804)	(2,638,230)	(2,870,297)	(3,074,700)
Ending retained earnings – to B/S		10,971	(2,847,167)	(13,636,065)	(15,199,705)	(9,559,021)	(5,505,304)	(2,429,500)	208,730	3,079,027	6,153,727

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Case–R–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			5,996,449								
VAT Payment			1,199,690								
VAT Recapture				(599,845)	(599,845)						
1995 Investment				16,622,705							
VAT Payment				3,324,541							
VAT Recapture					(1,662,271)	(1,662,271)					
1995 Investment					21,621,188						
VAT Payment					4,324,238						
VAT Recapture						(2,162,119)	(2,162,119)				
1996 Investment						12,226,460					
VAT Payment						2,445,292					
VAT Recapture							(1,222,646)	(1,222,646)			
Value Added Tax on Projects		0	1,199,690	3,324,541	4,324,238	2,445,292	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(599,845)	(2,262,115)	(3,824,389)	(3,384,765)	(1,222,646)	0	0	0
Net V.A.T. on Projects		0	1,199,690	2,724,696	2,062,122	(1,379,097)	(3,384,765)	(1,222,646)	0	0	0
On Sales											
(a) GAS & LPG Purchases		19,088,992	54,577,207	175,292,783	323,168,299	336,088,368	350,190,936	364,530,994	378,133,465	393,864,493	409,633,751
(b) Commodity = = Purchases / (1+VAT Rate)		15,007,493	45,481,006	146,077,319	269,306,916	280,073,638	291,825,780	303,775,828	315,111,221	328,220,411	341,361,459
(c) VAT included = Line (b) – Line (b)		3,181,499	9,096,201	29,215,464	53,861,383	56,014,728	58,365,156	60,755,166	63,022,244	65,644,082	68,272,292
(d) GAS & LPG Sales		21,544,036	62,166,624	202,432,226	377,013,669	392,995,384	409,034,598	425,339,655	440,799,664	458,943,970	477,134,949
(e) Commodity = = Purchases / (1+VAT Rate)		17,953,364	51,807,186	168,693,522	314,178,058	327,496,153	340,862,165	354,449,713	367,333,053	382,453,308	397,612,458
(f) VAT included = Line (d) – Line (e)		3,590,673	10,361,437	33,738,704	62,835,612	65,499,231	68,172,433	70,889,943	73,466,611	76,490,662	79,522,492
(g) Utility's VAT Liability = Line (f) – Line (c)		409,174	1,265,236	4,523,241	8,974,228	9,484,503	9,807,277	10,134,777	10,444,366	10,846,580	11,250,200
Test											
Margin on GAS & LPG Sales		2,455,045	7,591,417	27,136,443	53,845,370	56,907,018	58,843,663	60,808,661	62,666,199	65,079,477	67,501,198
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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Case–R–2

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			18,284,029	34,440,478	41,352,680	41,352,680	37,906,623	34,460,567	31,014,510	27,568,453
Beginning ruble/US$ exchange rate			$0.000419287	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179921
Decline in value			$0.000151979	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005230
Additional ruble debt/expense to record – in US$			2,779	1,727	438	238	205	176	160	144
Additional ruble debt/expense to record – in rubles cumulative			10,395,448	7,954,176	2,119,269	1,187,363	1,050,425	922,450	861,678	801,379
			10,395,448	18,349,624	20,468,892	21,656,255	22,706,680	23,629,129	24,490,807	25,292,186
Computation of payment on additional L/T debt – 1/12th cumulative							1,892,223	2,045,965	2,184,514	2,308,027
							1,892,223	3,938,188	6,122,702	8,430,729

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Case–R–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	17.2%	9.8%	13.9%	6.4%	4.1%	3.8%	3.7%	3.7%	3.8%	3.9%	4.0%
Short–Term Investments	5.2%	39.0%	12.3%	18.1%	22.8%	23.7%	28.1%	29.5%	30.6%	31.8%	33.0%
Cash & Investments	22.4%	48.9%	26.2%	24.6%	26.9%	27.5%	31.8%	33.2%	34.4%	35.6%	37.0%
Accounts receivable	44.9%	34.2%	26.8%	27.6%	26.2%	22.8%	21.9%	21.8%	21.9%	21.9%	22.0%
Materials & equipment	3.0%	1.7%	2.0%	1.0%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Other assets	0.9%	0.5%	0.6%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total Current Assets	71.2%	85.3%	55.6%	53.5%	54.0%	51.1%	54.4%	55.8%	57.0%	58.4%	59.8%
Fixed assets											
Adjusted Cost of Fixed Assets	90.8%	51.8%	90.0%	71.6%	64.6%	68.5%	67.0%	68.3%	70.0%	71.7%	73.4%
Less: Accumulated Depreciation	62.1%	37.2%	45.6%	25.1%	18.6%	19.6%	21.4%	24.1%	27.0%	30.0%	33.2%
Net Revalued Assets	28.8%	14.7%	44.4%	46.5%	46.0%	48.9%	45.6%	44.2%	43.0%	41.6%	40.2%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	65.6%	68.2%	52.8%	53.8%	50.5%	43.9%	42.1%	42.1%	42.1%	42.3%	42.5%
Total Current Liabilities	65.6%	68.2%	52.8%	53.8%	50.5%	43.9%	42.1%	42.1%	42.1%	42.3%	42.5%
Long Term Debt	0.0%	0.0%	25.1%	28.4%	27.2%	27.3%	25.1%	22.1%	19.4%	16.9%	14.5%
Additional debt due to currency rate	0.0%	0.0%	0.0%	16.1%	14.5%	13.5%	13.2%	12.1%	11.1%	10.0%	8.8%
Interim Financing	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
Other Funds	29.2%	16.7%	19.1%	9.5%	6.2%	5.8%	5.7%	5.8%	5.9%	6.1%	6.2%
Total Long Term Liabilities	29.2%	16.7%	44.2%	54.0%	47.9%	46.6%	43.9%	40.0%	36.4%	32.9%	29.5%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	14.6%	16.6%	13.3%	13.6%	15.8%	17.3%	19.3%	21.3%	23.1%	24.8%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	5.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	0.2%	−13.9%	−21.2%	−12.0%	−6.3%	−3.3%	−1.4%	0.1%	1.7%	3.2%
Net Equity	5.2%	15.2%	3.0%	−7.8%	1.6%	9.5%	14.0%	17.9%	21.4%	24.8%	28.0%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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Case–R–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	243,908	4,724,323	11,348,932	34,468,384	68,314,509	77,340,407	89,586,475	95,687,349	101,197,450	107,455,618	114,052,784
Current liabilities	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Working capital	19,210	948,508	553,524	(206,646)	4,391,604	10,861,903	20,318,474	23,582,875	26,402,398	29,548,958	33,026,954
Change in working capital		929,297	(394,984)	(760,170)	4,598,249	6,470,300	9,456,570	3,264,401	2,819,523	3,146,560	3,477,996
Current ratio	1.09	1.25	1.05	0.99	1.07	1.16	1.29	1.33	1.35	1.38	1.41
Capitalization Table:											
Debt	96,934	922,559	9,027,679	34,798,813	60,663,224	70,604,339	72,333,244	68,621,066	64,661,306	60,540,973	56,276,497
Equity	17,727	839,116	604,256	(5,013,658)	2,018,014	14,393,358	23,018,263	30,726,561	38,031,690	45,609,877	53,409,258
Percent debt	84.9%	52.4%	93.7%	116.8%	96.8%	83.1%	75.9%	69.1%	63.0%	57.0%	51.3%
Percent equity	15.1%	47.6%	6.3%	−16.8%	3.2%	16.9%	24.1%	30.9%	37.0%	43.0%	48.7%
Times Interest Earned:											
Net income	57,263	10,971	(2,858,139)	(10,788,898)	(1,563,640)	5,640,685	8,107,434	6,151,608	5,276,459	5,740,593	6,149,400
Add back: interest expense	0	0	256,447	1,170,649	2,636,225	3,789,658	4,135,268	3,962,965	3,618,360	3,273,754	2,929,148
depreciation	0	95,702	612,931	1,538,053	2,726,489	3,460,571	3,673,948	3,900,776	4,141,053	4,396,597	4,667,772
taxes	47,893	597,289	1,979,154	19,155,960	26,904,923	23,571,890	23,674,048	23,997,771	24,047,468	24,326,756	24,604,785
total	105,156	703,962	(9,606)	11,075,764	30,703,997	36,462,804	39,590,698	38,013,120	37,083,339	37,737,699	38,351,105
Interest	0	0	256,447	1,170,649	2,636,225	3,789,658	4,135,268	3,962,965	3,618,360	3,273,754	2,929,148
Time interest earned			−0.0	9.5	11.6	9.6	9.6	9.6	10.2	11.5	13.1
Operating revenue	1,747,019	21,544,036	62,168,624	202,432,226	377,013,669	392,995,384	409,034,598	425,339,655	440,798,664	458,943,970	477,134,949
Operating expenses (B4 depr, tax)	1,258,443	20,219,514	59,354,792	182,791,533	332,816,172	346,850,933	361,617,119	376,662,623	391,012,369	407,538,153	424,150,780
Operating margin	488,576	1,324,523	2,813,832	19,640,693	44,197,498	46,144,451	47,417,479	48,677,033	49,787,295	51,405,817	52,984,169
Percent	28.0%	6.1%	4.5%	9.7%	11.7%	11.7%	11.6%	11.4%	11.3%	11.2%	11.1%
Net income to total revenue	3.3%	0.1%	−4.6%	−5.3%	−0.4%	1.4%	2.0%	1.4%	1.2%	1.3%	1.3%
Return on total assets	16.7%	0.2%	−14.0%	−16.7%	−1.2%	3.7%	4.9%	3.6%	3.0%	3.1%	3.2%
Return on beginning equity		61.9%	−340.6%	−1785.5%	31.2%	279.5%	56.3%	26.7%	17.2%	15.1%	13.5%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum. Deprec. / Assets	68.3%	71.7%	50.6%	35.0%	28.7%	28.6%	31.9%	35.3%	38.6%	41.9%	45.3%
Receivables / Sales	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case–R–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		2,628,340	2,652,320	10,476,320	18,248,796	7,498,020	10,762,204	4,589,061	4,060,113	4,574,760	4,904,361
Accounts receivable		1,742,404	3,575,511	12,345,086	15,365,518	1,406,606	1,411,667	1,435,065	1,360,689	1,596,943	1,601,051
Materials & equipment		84,976	307,434	229,384	181,163	93,965	55,940	59,466	62,992	66,995	71,093
Other assets		24,695	89,344	66,662	52,648	27,307	16,257	17,282	18,306	19,470	20,661
Net fixed assets		714,716	8,265,243	20,913,191	28,298,034	15,846,159	897,240	731,718	525,847	311,294	56,909
		5,195,131	14,889,852	44,030,643	62,146,159	24,872,057	13,143,308	6,832,592	6,035,947	6,569,462	6,654,075
Credits:											
Accounts payable		3,551,117	7,019,593	23,877,622	29,249,876	2,555,598	2,789,498	2,836,473	2,690,578	3,111,608	3,119,170
Long term debt		0	5,128,943	13,155,086	16,156,449	6,912,202	0	(3,446,057)	(3,446,057)	(3,446,057)	(3,446,057)
Currency fluctuation on L/T debt			0	10,395,448	7,954,176	2,119,269	1,187,363	(841,799)	(1,123,515)	(1,322,836)	(1,506,648)
Other funds		822,625	2,976,177	2,220,601	1,753,786	909,644	541,542	575,677	609,812	648,559	688,229
Equity/retained earnings		821,389	(234,861)	(5,618,114)	7,031,872	12,375,344	8,624,905	7,708,298	7,305,129	7,578,187	7,799,381
		5,195,131	14,889,852	44,030,643	62,146,159	24,872,057	13,143,308	6,832,592	6,035,947	6,569,461	6,654,075
check: net change debits and credits		0	0	0	0	0	0	0	0	(1)	0
Does balance sheet balance?		1	0	(0)	(1)	(0)	(1)	(0)	(1)	(1)	0
check: analysis of change in fixed assets		(0)	(0)	0	(0)	0	0	(0)	(0)	0	0
check: analysis of change in equity/RE		(0)	(0)	0	(0)	0	(0)	0	(0)	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	(0)	0	(0)	0	(0)	(0)	0	(0)	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		2,560,047	9,261,993	10,473,204	13,224,058	9,450,380	6,401,329	6,804,820	7,208,310	7,666,327	8,135,249
Revaluation of accum depreciation		(1,749,629)	(6,638,715)	(5,302,420)	(4,628,546)	(2,715,721)	(1,830,141)	(2,172,326)	(2,541,411)	(2,958,436)	(3,410,568)
Current depreciation		(95,702)	(612,931)	(1,536,053)	(2,726,489)	(3,460,571)	(3,673,948)	(3,900,776)	(4,141,053)	(4,396,597)	(4,667,772)
New capital expenditures, net		0	6,254,896	17,280,460	22,429,011	12,572,070	0	0	0	0	0
		714,716	8,265,243	20,913,191	28,298,034	15,846,159	897,240	731,718	525,847	311,294	56,909
Analysis of change in net equity/RE											
Net income		10,971	(2,858,139)	(10,788,898)	(1,503,640)	5,640,685	8,107,434	6,151,608	5,276,459	5,740,593	6,149,400
Revaluation surplus (direct cr. to equity)		2,560,047	9,261,993	10,473,204	13,224,058	9,450,380	6,401,329	6,804,820	7,208,310	7,666,327	8,135,249
Revaluation of accum depreciation		(1,749,629)	(6,638,715)	(5,302,420)	(4,628,546)	(2,715,721)	(1,830,141)	(2,172,326)	(2,541,411)	(2,958,436)	(3,410,568)
Dividends declared		0	0	0	0	0	(4,053,717)	(3,075,804)	(2,638,230)	(2,870,297)	(3,074,700)
		821,389	(234,861)	(5,618,114)	7,031,872	12,375,344	8,624,905	7,708,298	7,305,129	7,578,187	7,799,381
Analysis of change in long term debt:											
New debt issued		0	5,128,943	13,155,086	16,156,449	6,912,202	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(3,446,057)	(3,446,057)	(3,446,057)	(3,446,057)
		0	5,128,943	13,155,086	16,156,449	6,912,202	0	(3,446,057)	(3,446,057)	(3,446,057)	(3,446,057)

RYAZAN

Case–R–3

INCOME STATEMENT

(Rubles x 1000)

(See Note A)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		203,984	1,219,702	7,179,206	17,416,852	17,448,824	17,422,142	17,386,671	17,348,336	17,749,055	18,156,460
Natural Gas, Other		21,330,175	60,907,177	195,187,499	359,512,518	375,452,521	391,512,619	407,844,983	423,338,797	441,075,440	458,851,645
Natural Gas, Total		21,534,158	62,126,879	202,366,705	376,929,370	392,901,345	408,934,761	425,233,654	440,687,133	458,824,495	477,008,106
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenuse	1,747,019	21,544,036	62,168,624	202,432,226	377,013,669	392,995,384	409,034,598	425,339,655	440,799,664	458,943,970	477,134,949
Other Revenues	2,245	18,480	78,097	122,579	157,710	175,931	186,779	198,310	210,526	223,517	237,303
TOTAL OPERATING INCOME	**1,749,264**	**21,562,517**	**62,246,721**	**202,554,805**	**377,171,379**	**393,171,315**	**409,221,377**	**425,537,966**	**441,010,189**	**459,167,487**	**477,372,253**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		74,477	439,093	2,584,514	6,270,067	6,281,577	6,271,971	6,259,922	6,245,401	6,389,660	6,536,326
Natural Gas, Other		18,988,999	54,030,285	172,539,023	316,680,481	329,563,879	343,661,077	357,997,263	371,597,389	387,166,220	402,769,777
Natural Gas, Total		19,063,476	54,469,377	175,123,537	322,950,548	335,845,456	349,933,048	364,257,184	377,842,790	393,555,880	409,306,103
LPG Purchases		25,516	107,830	169,246	217,75[illegible]	242,910	257,288	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,135,982	19,088,992	54,577,207	175,292,783	323,168,299	336,088,366	350,190,936	364,530,994	378,133,465	393,864,493	409,633,751
Payroll (Wages & Bonus)	70,050	646,660	2,732,869	4,289,427	5,518,765	6,156,391	6,535,992	6,939,520	7,366,976	7,821,591	8,304,014
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	52,411	483,842	2,044,716	3,209,324	4,129,108	4,606,176	4,890,191	5,192,108	5,511,928	5,852,069	6,213,015
TOTAL OPERATING EXPENSES	**1,258,443**	**20,219,514**	**59,354,792**	**182,791,533**	**332,816,172**	**346,850,933**	**361,617,119**	**376,662,623**	**391,012,369**	**407,538,153**	**424,150,780**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**490,821**	**1,343,003**	**2,891,929**	**19,763,271**	**44,355,207**	**46,320,382**	**47,604,258**	**48,875,343**	**49,997,821**	**51,629,334**	**53,221,472**

RYAZAN

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
DEDUCTIONS											
Depreciation		95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,766	6,692,956	7,105,224	7,543,687	8,008,969
Value Added Tax (on Sales)	385,665	409,174	1,265,236	4,523,241	8,974,228	9,484,503	9,807,277	10,134,777	10,444,366	10,846,580	11,250,200
Net Value Added Tax (on Projects)		0	2,121,741	5,144,003	5,193,354	(2,780,691)	(7,178,369)	(2,500,038)	0	0	0
Gas Rehabilitation Fund		245,504	759,142	2,713,944	5,384,537	5,690,702	5,884,366	6,060,866	6,266,620	6,507,948	6,750,120
TOTAL DEDUCTIONS	385,665	750,380	4,919,894	14,669,074	24,106,431	18,332,166	14,817,040	20,408,551	23,816,210	24,898,214	26,009,289
NET INCOME BEFORE INTEREST and TAXES	105,156	608,261	(1,981,860)	5,197,922	20,382,226	28,137,087	32,945,269	26,634,590	26,359,756	26,920,258	27,412,987
INTEREST and TAXES											
Interest Expenses		0	471,501	2,120,449	4,836,254	7,088,587	7,802,562	7,477,455	6,827,242	6,177,028	5,526,815
Currency fluctuation i[illegible] on debt			0	18,750,300	14,722,439	3,998,707	2,240,356	1,981,976	1,740,509	1,625,843	1,512,068
Taxes:											
Corporate Income Tax	33,396	429,761	925,417	6,324,247	14,193,666	14,822,522	15,233,363	15,640,110	15,999,303	16,521,387	17,030,871
Excess Payroll Tax	14,497	126,103	532,909	836,438	1,076,159	1,200,496	1,274,518	1,353,206	1,436,560	1,525,210	1,619,283
Property Tax		31,606	234,014	367,757	982,261	1,695,062	1,969,461	2,144,289	2,188,192	2,207,117	2,235,380
Road Tax		9,820	30,366	108,558	215,381	227,628	235,375	243,235	250,665	260,318	270,005
TOTAL INTEREST and TAXES	47,893	597,289	2,194,207	28,507,749	36,026,160	29,033,003	28,755,634	26,840,272	28,442,470	28,316,904	28,194,422
NET INCOME	57,263	10,971	(4,156,067)	(23,309,827)	(15,643,932)	(895,915)	4,189,635	(205,681)	(2,082,715)	(1,396,646)	(781,435)
Memo: Weighted Ave Cost of Gas		9,050	26,459	85,552	156,683	162,172	167,545	173,253	179,309	185,302	191,489
Memo: Weighted Ave Sales Price of Gas		10,368	30,483	99,324	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,190	3,757	13,398	26,276	27,551	28,249	29,002	29,823	30,731	31,673
Memo: Cash Flow From Natural Gas		2,470,682	7,657,502	27,243,168	53,978,822	57,055,889	59,001,713	60,976,470	62,844,344	65,266,616	67,702,002
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

RYAZAN

Case–R–3

BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	58,981	544,494	2,845,527	4,156,124	5,191,208	5,728,079	6,047,697	6,387,461	6,747,372	7,130,151	7,536,344
Short–Term Investments	17,843	2,160,670	850,614	2,072,600	2,520,159	1,526,245	13,692,742	13,745,948	11,740,757	10,679,501	10,366,338
Cash & Short Term Investments	76,824	2,705,164	3,696,141	6,228,724	7,711,366	7,254,324	19,740,438	20,133,409	18,488,129	17,809,653	17,902,682
Accounts receivable – Gross *(See Note C.)*	153,761	1,696,165	5,471,676	17,816,762	33,182,280	34,588,886	36,000,553	37,435,618	38,796,307	40,393,250	41,994,301
Materials & equipment	10,323	95,299	402,732	632,116	813,279	907,244	963,184	1,022,650	1,085,643	1,152,638	1,223,731
Other assets	3,000	27,695	117,039	183,701	236,350	263,657	279,914	297,196	315,502	334,972	355,632
Total Current Assets	243,908	4,724,323	9,687,588	24,861,304	41,943,276	43,014,111	56,984,090	58,888,874	58,685,581	59,690,513	61,476,346
Fixed assets											
Adusted Cost of Fixed Assets	310,999	2,871,046	23,213,244	68,636,609	136,629,342	178,129,559	189,112,968	200,788,687	213,156,716	226,310,611	240,269,083
Less: Accumulated Depreciation	212,548	2,057,878	9,470,369	17,152,287	26,622,398	35,635,944	44,137,010	53,554,959	63,959,020	75,449,617	88,112,196
Net Revalued Assets	98,451	813,167	13,742,876	51,484,322	110,006,944	142,493,615	144,975,957	147,233,728	149,197,696	150,860,994	152,156,887
TOTAL ASSETS	342,359	5,537,490	23,430,464	76,345,626	151,950,220	185,507,725	201,960,047	206,122,602	207,883,276	210,551,507	213,633,233
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Total Current Liabilities	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,906,660	81,025,830
Long Term Debt		0	9,430,013	32,978,958	63,746,114	78,025,621	78,025,621	71,523,486	65,021,351	58,519,216	52,017,081
Additional debt due to currency rate			0	18,750,300	33,472,739	37,471,446	39,711,602	38,219,296	36,195,239	33,795,098	31,048,132
Other Funds	99,934	922,559	3,898,736	6,119,337	7,873,123	8,782,766	9,324,309	9,899,986	10,509,796	11,156,357	11,846,586
Total Long Term Liabilities	99,934	922,559	13,328,750	57,848,595	105,091,976	124,279,834	127,061,732	119,642,769	111,726,386	103,472,671	94,911,800
Other Liabilities & Equity											
Net Revaluation Surplus		810,418	3,433,696	11,261,217	26,016,485	38,728,451	47,512,559	56,463,286	65,532,477	74,739,463	84,044,325
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727
Retained Earnings	0	10,971	(4,145,115)	(27,454,943)	(43,096,874)	(43,994,760)	(41,899,972)	(42,105,654)	(44,188,368)	(45,585,014)	(46,366,449)
Net Equity	17,727	839,116	(693,693)	(16,175,999)	(17,064,662)	(5,250,612)	5,630,314	14,375,359	21,361,836	29,172,176	37,695,603
TOTAL LIABILITIES & EQUITY	342,359	5,537,491	23,430,465	76,345,626	151,950,219	185,507,726	201,960,047	206,122,602	207,883,277	210,551,507	213,633,233

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

RYAZAN

Case–R–3

Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		10,971	(4,156,087)	(23,309,827)	(15,643,932)	(895,915)	4,189,635	(205,681)	(2,082,715)	(1,396,646)	(781,435)
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,766	6,692,956	7,105,224	7,543,687	8,008,969
Currency fluctuation loss on L/T debt			0	18,750,300	14,722,439	3,998,707	2,240,356	1,981,976	1,740,509	1,625,843	1,512,068
Changes in assets and liabilities:											
Accounts receivable		(1,742,404)	(3,575,511)	(12,345,086)	(15,365,518)	(1,406,606)	(1,411,667)	(1,435,065)	(1,360,689)	(1,598,943)	(1,601,051)
Materials and supplies		(84,976)	(307,434)	(229,384)	(181,163)	(93,965)	(55,940)	(59,466)	(62,992)	(66,995)	(71,093)
Other assets		(24,695)	(89,344)	(66,662)	(52,648)	(27,307)	(16,257)	(17,282)	(18,306)	(19,470)	(20,661)
Accounts payable		3,551,117	7,019,593	23,877,622	29,249,878	2,555,596	2,789,496	2,836,473	2,690,576	3,111,608	3,119,170
Other funds		822,625	2,976,177	2,220,601	1,753,786	909,644	541,542	575,677	609,812	646,559	688,229
Net cash provided by operations		2,628,340	2,641,169	11,185,451	19,037,151	10,977,808	14,580,932	10,369,588	8,621,4[illegible]	9,849,643	10,854,197
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,650,192)	(8,652,868)	(17,554,509)	(11,434,850)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(9,430,013)	(23,548,944)	(30,767,156)	(14,279,507)	0	0	0	0	0
Net cash used in investing activities		0	(11,080,205)	(32,201,812)	(48,221,665)	(25,714,357)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
Loss on Currency Fluctuation		0	0	0	0	0	0	(3,474,481)	(3,764,566)	(4,025,985)	(4,259,034)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(2,094,817)	0	0	0	0
Net cash provided (used in) financing activities		0	9,430,013	23,548,944	30,767,156	14,279,507	(2,094,817)	(9,976,617)	(10,266,70[illegible])	(10,528,120)	(10,761,169)
Net increase (decrease) in cash and cash equivalents		2,628,340	990,977	2,532,583	1,482,642	(457,042)	12,486,114	392,971	(1,645,280)	(678,476)	93,029
Cash and cash equivalents–beginning		76,824	2,705,164	3,696,141	6,228,724	7,711,366	7,254,324	19,740,438	20,133,409	18,488,129	17,809,653
Cash and cash equivalents–ending		2,705,164	3,696,141	6,228,724	7,711,366	7,254,324	19,740,438	20,133,409	18,488,129	17,809,653	17,902,682

Unaudited – For Study Purposes Only

RYAZAN

Case–R–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	293,943	310,999	2,871,046	23,213,244	66,636,609	136,629,342	176,129,559	189,112,966	200,788,687	213,156,716	226,310,611
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	293,943	2,871,046	12,133,039	36,434,797	88,307,677	152,415,202	189,112,966	200,786,687	213,156,716	226,310,611	240,269,083
New Investments (Current Year)	0	0	11,080,205	32,201,812	48,321,665	25,714,357	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	17,056										
Ending Value of Assets (Gross)	310,999	2,871,046	23,213,244	66,636,609	136,629,342	176,129,559	189,112,966	200,788,687	213,156,716	226,310,611	240,269,083
Accumulated Depreciation		212,548	2,057,878	9,470,369	17,152,287	26,622,393	35,635,944	44,137,010	53,554,959	63,959,020	75,449,617
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	212,548	1,962,177	6,698,594	14,864,400	22,068,087	29,698,292	37,833,245	46,862,002	56,853,793	67,905,930	80,103,227
Current Depreciation		95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,766	6,692,956	7,105,224	7,543,687	8,008,963
Net Value of Assets	98,451	813,167	13,742,876	51,484,322	110,006,944	142,493,615	144,975,957	147,233,728	149,197,698	150,860,994	152,156,887
Accum. Revaluation Surplus		2,580,047	11,822,040	25,043,592	44,714,660	60,500,520	71,483,929	83,159,648	95,527,677	108,681,572	122,640,044
Accum. Reevaluated Depreciation		1,749,629	8,388,344	13,782,376	18,698,175	21,774,070	23,971,370	26,696,362	29,995,200	33,942,109	38,595,719
Net Reevaluation Surplus		810,418	3,433,696	11,261,217	26,016,485	38,726,451	47,512,559	56,463,286	65,532,477	74,739,463	84,044,325

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Case–R–3

Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	106,062	103,440	100,677	97,828	94,923	91,970	88,962	85,974	82,954	82,159	81,360
Other	2,049,100	2,003,059	1,957,995	1,949,164	1,966,249	1,978,951	1,999,615	2,016,489	2,024,266	2,041,704	2,056,137
Total	2,155,162	2,106,499	2,058,672	2,046,992	2,061,172	2,070,921	2,088,597	2,102,463	2,107,220	2,123,863	2,137,497
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.1%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	104,577	101,992	100,677	97,828	94,923	91,970	88,962	85,974	82,954	82,159	81,360
Other	2,020,413	1,975,016	1,937,436	1,935,520	1,959,367	1,978,951	1,999,615	2,016,489	2,024,266	2,041,704	2,056,137
Total	2,124,990	2,077,008	2,038,113	2,033,348	2,054,290	2,070,921	2,088,597	2,102,463	2,107,220	2,123,863	2,137,497
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,612	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,867
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,464	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,464	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Case-R-3

Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to [illegible]% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		828.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		719	2,385	3,741	4,605	4,841	4,960	5,118	5,255	5,401	5,558
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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Case–R–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		1.3%	−30.2%	−45.3%	−14.2%	−0.6%	2.9%	−0.1%	−1.4%	−0.9%	−0.5%
Average over Period 1998–2002							−0.0%				
External Financing		0.0%	68.9%	79.2%	72.1%	68.8%	68.8%				

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Case–R–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993–US$ x 000)			293.00	1625.00	2941.00	1869.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			297	1,684	3,144	2,067	0	0	0	0	0
Duties on Foreign Suppliers			471,501	1,177,447	1,538,358	713,975	0	0	0	0	0
Domestic Supplier (Current–Rubles x 000)			1,178,691	7,475,421	16,016,151	10,720,674	0	0	0	0	0
Foreign Supplier (1993–US$ x 000)			3907.00	6149.00	6250.00	2667.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			3,954	6,370	6,681	2,950	0	0	0	0	0
Foreign Supplier (Current–Rubles x 000)			9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		106,673	(3,382,312)	(21,021,940)	(11,089,620)	5,041,736	10,493,400	6,487,275	5,022,509	6,147,041	7,227,535
Less Retirements			0	0	0	0	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
Less Domestic Suppliers		0	(1,650,192)	(6,652,808)	(17,554,509)	(11,434,650)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(2,094,817)	0	0	0	0
Funds Available/(Required)		106,673	(5,032,504)	(29,674,808)	(28,644,129)	(6,393,113)	8,398,583	(14,860)	(1,479,626)	(355,094)	725,400
External Sources (Foreign Projects)		0	9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Accumulative Long–Term Debt			9,430,013	32,978,958	63,746,114	78,025,621	78,025,621	71,523,486	65,021,351	58,519,216	52,017,081
Retirements								6,502,135	6,502,135	6,502,135	6,502,135
Interest			471,501	2,120,449	4,836,254	7,088,537	7,802,562	7,477,455	6,827,242	6,177,028	5,526,815
Memo: Total Project		0	10,608,705	41,633,070	88,416,377	113,416,759	113,416,759	113,416,759	113,416,759	113,416,759	113,416,759
Memo: % Externally Financed		0.0%	88.9%	79.2%	72.1%	68.8%	68.8%				
Computation of ending retained earnings:											
Beginning retained earnings		0	10,971	(4,145,115)	(27,454,943)	(43,098,874)	(43,994,790)	(41,899,972)	(42,105,654)	(44,188,368)	(45,585,014)
adjusted net income		10,971	(4,156,087)	(23,309,827)	(15,643,932)	(895,915)	4,189,635	(205,681)	(2,082,715)	(1,396,646)	(781,435)
less: dividends		0	0	0	0	0	(2,094,817)	0	0	0	0
Ending retained earnings – to B/S		10,971	(4,145,115)	(27,454,943)	(43,098,874)	(43,994,790)	(41,899,972)	(42,105,654)	(44,188,368)	(45,585,014)	(46,366,449)

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Case–R–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			10,608,705								
VAT Payment			2,121,741								
VAT Recapture				(1,060,870)	(1,060,870)						
1995 Investment				31,024,365							
VAT Payment				6,204,873							
VAT Recapture					(3,102,437)	(3,102,437)					
1996 Investment					46,783,307						
VAT Payment					9,356,661						
VAT Recapture						(4,678,331)	(4,678,331)				
1998 Investment						25,000,382					
VAT Payment						5,000,076					
VAT Recapture							(2,500,038)	(2,500,038)			
Value Added Tax on Projects		0	2,121,741	6,204,873	9,356,661	5,000,076	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,060,870)	(4,163,307)	(7,780,767)	(7,178,369)	(2,500,038)	0	0	0
Net V.A.T. on Projects		0	2,121,741	5,144,003	5,193,354	(2,780,691)	(7,178,369)	(2,500,038)	0	0	0
On Sales											
(a) GAS & LPG Purchases		19,088,992	54,577,207	175,292,783	323,168,299	336,088,368	350,190,936	364,530,994	378,133,465	393,864,493	409,633,751
(b) Commodity = = Purchases / (1+VAT Rate)		15,907,493	45,481,006	146,077,319	269,306,916	280,073,636	291,825,780	303,775,828	315,111,221	328,220,411	341,361,459
(c) VAT Included = Line (b) – Line (b)		3,181,499	9,096,201	29,215,464	53,861,383	56,014,728	58,365,156	60,755,166	63,022,244	65,644,082	68,272,292
(d) GAS & LPG Sales		21,544,036	62,168,624	202,432,226	377,013,669	392,995,384	409,034,598	425,339,655	440,799,664	458,943,970	477,134,949
(e) Commodity = = Purchases / (1+VAT Rate)		17,953,364	51,807,186	168,693,522	314,178,058	327,496,153	340,862,165	354,449,713	367,333,053	382,453,308	397,612,458
(f) VAT Included = Line (d) – Line (e)		3,590,673	10,361,437	33,738,704	62,835,612	65,499,231	68,172,433	70,889,943	73,466,611	76,490,662	79,522,492
(g) Utility's VAT Liability = Line (f) – Line (c)		409,174	1,265,236	4,523,241	8,974,228	9,484,503	9,807,277	10,134,777	10,444,366	10,846,580	11,250,200
Test											
Margin on GAS & LPG Sales		2,455,045	7,591,417	27,139,443	53,845,370	58,907,018	58,843,663	60,808,661	62,666,199	65,079,477	67,501,198
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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Case-R-3

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			32,978,958	63,746,114	78,025,621	78,025,621	71,523,486	65,021,351	58,519,216	52,017,081
Beginning ruble/US$ exchange rate			$0.000419287	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179921
Decline in value			$0.000151979	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005230
Additional ruble debt/expense to record -- in US$			5,012	3,197	826	450	387	331	301	272
Additional ruble debt/expense to record – in rubles			18,750,300	14,722,439	3,998,707	2,240,356	1,981,976	1,740,509	1,625,843	1,512,068
cumulative			18,750,300	33,472,739	37,471,446	39,711,802	41,693,778	43,434,287	45,060,130	46,572,198
Computation of payment on							3,474,481	3,764,566	4,025,985	4,259,034
additional L/T debt – 1/12th cumulative							3,474,481	7,239,048	11,265,033	15,524,066

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Case–R–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	17.2%	9.8%	12.1%	5.4%	3.4%	3.1%	3.0%	3.1%	3.2%	3.4%	3.5%
Short–Term Investments	5.2%	39.0%	3.6%	2.7%	1.7%	0.8%	6.8%	6.7%	5.6%	5.1%	4.9%
Cash & Investments	22.4%	48.9%	15.8%	8.2%	5.1%	3.9%	9.8%	9.8%	8.9%	8.5%	8.4%
Accounts receivable	44.9%	34.2%	23.4%	23.3%	23.6%	18.6%	17.8%	18.2%	18.7%	19.2%	19.7%
Materials & equipment	3.0%	1.7%	1.7%	0.6%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%
Other assets	0.9%	0.5%	0.5%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%
Total Current Assets	71.2%	85.3%	41.3%	32.6%	27.6%	23.2%	28.2%	28.6%	28.2%	28.3%	28.8%
Fixed assets											
Adusted Cost of Fixed Assets	90.8%	51.8%	63.1%	89.9%	89.9%	96.0%	93.6%	97.4%	102.5%	107.5%	112.5%
Less: Accumulated Depreciation	62.1%	37.2%	40.4%	22.5%	17.5%	13.2%	21.9%	26.0%	30.8%	35.8%	41.2%
Net Revalued Assets	28.8%	14.7%	58.7%	67.4%	72.4%	76.8%	71.8%	71.4%	71.8%	71.7%	71.2%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	65.6%	68.2%	46.1%	45.4%	42.1%	35.8%	34.3%	35.0%	36.0%	37.0%	37.9%
Total Current Liabilities	65.6%	68.2%	46.1%	45.4%	42.1%	35.8%	34.3%	35.0%	36.0%	37.0%	37.9%
Long Term Debt	0.0%	0.0%	40.2%	43.2%	42.0%	42.1%	38.6%	34.7%	31.3%	27.8%	24.3%
Additional debt due to currency rate	0.0%	0.0%	0.0%	24.6%	22.0%	20.2%	19.7%	18.5%	17.4%	16.1%	14.5%
Interim Financing	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
Other Funds	29.2%	16.7%	16.6%	8.0%	5.2%	4.7%	4.6%	4.8%	5.1%	5.3%	5.5%
Total Long Term Liabilities	29.2%	16.7%	56.9%	75.8%	69.2%	67.0%	62.9%	58.0%	53.7%	49.1%	44.4%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	14.6%	14.7%	14.5%	17.1%	20.9%	23.5%	27.4%	31.5%	35.5%	39.3%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	5.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	0.2%	−17.7%	−36.0%	−28.4%	−23.7%	−20.7%	−20.4%	−21.3%	−21.7%	−21.7%
Net Equity	5.2%	15.2%	−3.0%	−21.2%	−11.2%	−2.8%	2.8%	7.0%	10.3%	13.9%	17.6%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

RYAZAN

Case–R–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	243,908	4,724,323	9,687,588	24,861,304	41,943,276	43,014,111	56,984,090	58,888,874	58,685,581	59,690,513	61,476,346
Current liabilities	224,698	3,775,815	10,795,408	34,673,030	63,922,906	66,478,504	69,268,001	72,104,475	74,795,052	77,903,660	81,025,830
Working capital	19,210	948,508	(1,107,820)	(9,811,726)	(21,979,630)	(23,464,393)	(12,283,912)	(13,215,601)	(16,109,472)	(18,216,148)	(19,549,484)
Change in working capital		929,297	(2,056,327)	(8,703,906)	(12,167,904)	(1,484,763)	11,180,481	(931,689)	(2,893,871)	(2,106,676)	(1,333,336)
Current ratio	1.09	1.25	0.90	0.72	0.66	0.65	0.82	0.82	0.78	0.77	0.76
Capitalization Table:											
Debt	99,934	922,559	13,328,750	57,848,595	105,091,976	124,279,834	127,061,732	119,642,769	111,726,388	103,472,671	94,911,800
Equity	17,727	839,116	(693,693)	(16,175,999)	(17,064,662)	(5,250,612)	5,630,314	14,375,359	21,361,836	29,172,176	37,695,603
Percent debt	84.9%	52.4%	105.5%	138.6%	119.4%	104.4%	95.8%	89.3%	83.9%	78.0%	71.6%
Percent equity	15.1%	47.6%	−5.5%	−38.6%	−19.4%	−4.4%	4.2%	10.7%	16.1%	22.0%	28.4%
Times Interest Earned:											
Net income	57,263	10,971	(4,156,087)	(23,309,827)	(15,643,932)	(895,915)	4,189,635	(205,631)	(2,082,715)	(1,398,946)	(781,435)
Add back: interest expense	0	0	471,501	2,120,449	4,836,254	7,088,587	7,802,562	7,477,455	6,827,242	6,177,028	5,526,815
depreciation	0	95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,766	6,692,956	7,105,224	7,543,687	8,008,969
taxes	47,893	597,289	2,194,207	28,507,749	36,026,160	29,033,003	28,755,634	28,840,272	28,442,470	28,316,904	28,194,422
total	105,156	703,962	(715,604)	9,606,258	29,772,793	41,163,326	47,051,596	42,805,002	40,292,221	40,640,974	40,948,772
Interest	0	0	471,501	2,120,449	4,836,254	7,088,587	7,802,562	7,477,455	6,827,242	6,177,028	5,526,815
Time interest earned			−1.5	4.5	6.2	5.8	6.0	5.7	5.9	6.6	7.4
Operating revenue	1,747,019	21,544,036	62,168,624	202,432,226	377,013,669	392,995,384	409,034,598	425,339,655	440,799,664	458,943,970	477,134,949
Operating expenses (B4 depr, tax)	1,258,443	20,219,514	59,354,792	182,791,533	332,816,172	346,850,933	361,617,119	376,662,623	391,012,369	407,538,153	424,150,780
Operating margin	488,576	1,324,523	2,813,832	19,640,693	44,197,496	46,144,451	47,417,479	48,677,033	49,787,295	51,405,817	52,984,169
Percent	28.0%	6.1%	4.5%	9.7%	11.7%	11.7%	11.6%	11.4%	11.3%	11.2%	11.1%
Net income to total revenue	3.3%	0.1%	−6.7%	−11.5%	−4.1%	−0.2%	1.0%	−0.0%	−0.5%	−0.3%	−0.2%
Return on total assets	16.7%	0.2%	−17.7%	−30.5%	−10.3%	−0.5%	2.1%	−0.1%	−1.0%	−0.7%	−0.4%
Return on beginning equity		61.9%	−495.3%	3360.3%	96.7%	5.3%	−79.6%	−3.7%	−14.5%	−6.5%	−2.7%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
Accum. Deprec. / Assets	66.3%	71.7%	40.8%	25.0%	19.5%	20.0%	23.3%	26.7%	30.0%	33.3%	36.7%
Receivables / Sales	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case–R–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		2,628,340	990,977	2,532,583	1,482,643	(457,043)	12,486,115	392,971	(1,645,281)	(678,476)	93,029
Accounts receivable		1,742,404	3,575,511	12,345,086	15,365,518	1,406,608	1,411,667	1,435,065	1,360,689	1,596,943	1,601,051
Materials & equipment		84,976	307,434	229,384	181,163	93,965	55,940	50,466	62,992	66,995	71,095
Other assets		24,695	89,344	66,662	52,648	27,307	16,257	17,262	18,308	19,470	20,661
Net fixed assets		714,716	12,929,708	37,741,446	58,522,622	32,488,671	2,482,343	2,257,771	1,983,968	1,663,299	1,295,892
		5,195,131	17,892,974	52,915,161	75,604,594	33,557,506	16,452,322	4,162,555	1,760,674	2,668,231	3,081,726
Credits:											
Accounts payable		3,551,117	7,019,593	23,877,622	29,249,876	2,555,598	2,789,496	2,836,473	2,690,578	3,111,608	3,119,170
Long term debt		0	9,430,013	23,548,944	30,767,156	14,279,507	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
Currency fluctuation on L/T debt			0	18,750,300	14,722,439	3,998,707	2,240,356	(1,492,505)	(2,024,057)	(2,400,142)	(2,746,965)
Other funds		822,625	2,976,177	2,220,601	1,753,786	909,644	541,542	575,677	609,812	648,559	688,229
Equity/retained earnings		821,369	(1,532,809)	(15,482,307)	(888,663)	11,814,050	10,880,926	8,745,046	6,986,477	7,810,340	8,523,427
		5,195,131	17,892,974	52,915,160	75,604,594	33,557,506	16,452,322	4,162,556	1,760,675	2,668,230	3,081,726
check: net change debits and credits		0	0	(1)	0	0	0	1	1	(1)	0
Does balance sheet balance?		1	1	0	(0)	0	(0)	1	0	0	0
check: analysis of change in fixed assets		(0)	(0)	(0)	(0)	0	0	0	0	0	(0)
check: analysis of change in equity/RE		(0)	(0)	(0)	0	(0)	0	0	0	0	(0)
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	0	0	(0)	0	(0)	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		2,560,047	9,261,993	13,221,552	19,671,068	15,785,860	10,983,409	11,675,719	12,368,029	13,153,895	13,958,472
Revaluation of accum depreciation		(1,749,629)	(6,636,715)	(5,394,032)	(4,915,799)	(3,075,895)	(2,197,300)	(2,724,992)	(3,298,838)	(3,946,909)	(4,653,610)
Current depreciation		(95,702)	(773,775)	(2,287,887)	(4,554,311)	(5,937,652)	(6,303,766)	(6,692,956)	(7,105,224)	(7,543,687)	(8,008,969)
New capital expenditures, net		0	11,080,205	32,201,812	48,321,665	25,714,357	0	0	0	0	0
		714,716	12,929,708	37,741,446	58,522,622	32,488,671	2,482,343	2,257,771	1,983,968	1,663,299	1,295,892
Analysis of change in net equity/RE											
Net income		10,971	(4,156,087)	(23,309,827)	(15,643,932)	(895,915)	4,189,635	(205,681)	(2,082,715)	(1,396,646)	(781,435)
Revaluation surplus (direct cr. to equity)		2,560,047	9,261,993	13,221,552	19,671,068	15,785,860	10,983,409	11,675,719	12,368,029	13,153,895	13,958,472
Revaluation of accum depreciation		(1,749,629)	(6,636,715)	(5,394,032)	(4,915,799)	(3,075,895)	(2,197,300)	(2,724,992)	(3,298,838)	(3,946,909)	(4,653,610)
Dividends declared		0	0	0	0	0	(2,094,817)	0	0	0	0
		821,369	(1,532,809)	(15,482,307)	(888,663)	11,814,050	10,880,926	8,745,046	6,986,477	7,810,340	8,523,427
Analysis of change in long term debt:											
New debt issued		0	9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
		0	9,430,013	23,548,944	30,767,156	14,279,507	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)

RYAZAN

Case–R–4

INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		203,984	1,219,702	7,558,905	19,261,049	20,224,472	21,125,194	22,020,109	21,981,865	22,341,485	22,700,262
Natural Gas, Other		21,330,175	60,907,177	191,530,120	352,894,193	368,710,334	384,717,980	401,058,114	416,444,761	433,868,886	451,376,611
Natural Gas, Total		21,534,158	62,126,879	199,089,024	372,155,243	388,934,806	405,843,174	423,078,223	438,426,625	456,230,371	474,076,873
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	1,747,019	21,544,036	62,168,624	199,154,545	372,239,542	389,028,845	405,943,011	423,184,224	438,539,156	456,349,846	474,203,716
Other Revenues	2,245	18,480	78,097	122,579	157,710	175,931	186,779	198,310	210,526	223,517	237,303
TOTAL OPERATING INCOME	**1,749,264**	**21,562,517**	**62,246,721**	**199,277,124**	**372,397,251**	**389,204,776**	**406,129,790**	**423,382,534**	**438,749,681**	**456,573,363**	**474,441,020**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		74,477	439,093	2,721,206	6,933,978	7,280,810	7,605,070	7,927,239	7,913,471	8,042,935	8,172,094
Natural Gas, Other		18,988,999	54,030,285	169,306,025	310,850,658	323,645,738	337,696,894	352,039,900	365,545,957	380,858,023	396,208,358
Natural Gas, Total		19,063,476	54,469,377	172,027,231	317,784,636	330,926,548	345,301,963	359,967,139	373,459,428	388,900,957	404,380,453
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,135,962	19,088,992	54,577,207	172,196,477	318,002,387	331,169,458	345,559,851	360,240,949	373,750,103	389,209,570	404,708,100
Payroll (Wages & Bonus)	70,050	646,660	2,732,669	4,289,427	5,518,765	6,156,391	6,535,992	6,939,520	7,369,976	7,821,591	8,304,014
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	52,411	483,842	2,044,716	3,209,324	4,129,108	4,606,176	4,890,191	5,192,108	5,511,928	5,852,069	6,213,015
TOTAL OPERATING EXPENSES	**1,258,443**	**20,219,514**	**59,354,792**	**179,695,227**	**327,650,260**	**341,932,025**	**356,986,034**	**372,372,577**	**386,629,007**	**402,883,230**	**419,225,130**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**490,821**	**1,343,003**	**2,891,929**	**19,581,897**	**44,746,992**	**47,272,751**	**49,143,756**	**51,009,957**	**52,120,675**	**53,690,133**	**55,215,890**

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Case–R–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
DEDUCTIONS											
Depreciation		95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,760	6,692,956	7,105,224	7,543,687	8,008,989
Value Added Tax (on Sales)	385,665	409,174	1,265,236	4,493,011	9,039,526	9,643,231	10,063,860	10,490,546	10,798,175	11,190,046	11,582,603
Net Value Added Tax (on Projects)		0	2,121,741	5,144,003	5,193,354	(2,780,991)	(7,178,369)	(2,500,038)	0	0	0
Gas Rehabilitation Fund		245,504	759,142	2,695,807	5,423,715	5,785,939	6,039,316	6,294,327	6,478,905	6,714,028	6,949,562
TOTAL DEDUCTIONS	385,665	750,380	4,919,894	14,620,708	24,210,907	18,586,131	15,227,573	20,977,791	24,382,304	25,447,761	26,541,134
NET INCOME BEFORE INTEREST and TAXES	105,156	608,261	(1,961,660)	5,064,914	20,669,537	26,835,491	34,074,233	30,199,974	27,916,515	28,431,511	28,875,560
INTEREST and TAXES											
Interest Expenses		0	471,50[illegible]	2,120,449	4,836,254	7,088,587	7,802,562	7,477,455	6,827,242	6,177,028	5,526,815
Currency fluctuation loss on debt			0	18,750,300	14,722,439	3,998,707	2,240,356	1,961,976	1,740,509	1,625,843	1,512,068
Taxes:											
Corporate Income Tax	33,396	429,761	925,417	6,266,207	14,319,037	15,127,280	15,726,002	16,323,186	16,678,616	17,180,842	17,669,085
Excess Payroll Tax	14,497	126,103	532,909	836,438	1,076,159	1,200,496	1,274,518	1,353,206	1,433,560	1,525,210	1,619,283
Property Tax		31,606	234,014	367,757	973,426	1,684,723	1,964,388	2,143,193	2,193,547	2,221,446	2,257,942
Road Tax		9,820	30,366	107,832	216,949	231,438	241,533	251,773	259,156	268,561	277,982
TOTAL INTEREST and TAXES	47,893	597,289	2,194,207	28,448,984	36,144,263	29,331,231	29,249,358	29,530,790	29,135,630	28,998,932	28,863,175
NET INCOME	57,263	10,971	(4,156,067)	(23,384,070)	(15,474,726)	(495,739)	4,824,875	669,184	(1,219,115)	(567,421)	12,385
Memo: Weighted Ave Cost of Gas		9,050	26,459	85,346	156,158	161,426	166,587	172,084	178,142	184,151	190,354
Memo: Weighted Ave Sales Price of Gas		10,368	30,483	99,432	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,190	3,757	13,516	26,806	28,297	29,207	30,171	30,990	31,882	32,808
Memo: Cash Flow From Natural Gas		2,470,682	7,657,502	27,061,794	54,370,607	58,008,258	60,541,210	63,111,083	64,967,197	67,329,414	69,696,420
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

RYAZAN

Case–R–4

BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	58,981	544,494	2,845,527	4,156,124	5,191,208	5,728,079	[illegible]	6,387,461	6,747,372	7,130,151	7,536,344
Short–Term Investments	17,843	2,160,670	850,614	1,674,385	2,013,487	1,397,52[illegible]	13,861,569	14,440,113	13,289,312	13,032,928	13,483,511
Cash & Short Term Investments	76,824	2,705,164	3,696,141	5,830,509	7,204,695	7,1[illegible]5,607	19,909,266	20,827,575	20,036,684	20,163,079	21,019,855
Accounts receivable – Gross *(See Note C.)*	153,761	1,896,165	5,471,676	17,528,282	32,762,093	34,239,778	35,728,452	37,245,911	38,597,352	40,164,932	41,736,313
Materials & equipment	10,323	95,269	402,732	632,116	813,279	907,244	963,184	1,022,650	1,085,643	1,152,638	1,223,731
Other assets	3,000	27,695	117,039	183,701	236,350	263,657	279,914	297,196	315,502	334,972	355,632
Total Current Assets	243,908	4,724,323	9,687,588	24,174,609	41,016,417	42,536,285	56,880,816	59,393,332	60,035,181	61,815,621	64,335,531
Fixed assets											
Adusted Cost of Fixed Assets	310,999	2,871,046	23,213,244	68,636,609	136,629,342	178,129,559	189,112,968	200,788,687	213,156,716	226,310,611	240,269,083
Less: Accumulated Depreciation	212,548	2,057,878	9,470,369	17,152,287	26,622,398	35,635,944	44,137,010	53,554,959	63,959,020	75,449,617	88,112,196
Net Revalued Assets	98,451	813,167	13,742,876	51,484,322	110,006,944	142,493,615	144,975,957	147,233,728	149,197,696	150,860,994	152,156,887
TOTAL ASSETS	342,359	5,537,490	23,430,464	75,658,931	151,023,361	185,029,900	201,856,773	206,627,060	209,232,877	212,676,616	216,492,418
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	224,698	3,775,815	10,795,408	34,060,578	62,901,085	65,505,540	68,351,970	71,255,901	73,928,021	76,985,913	80,051,533
Total Current Liabilities	224,698	3,775,815	10,795,408	34,060,578	62,901,085	65,505,540	68,351,970	71,255,901	73,928,021	76,985,913	80,051,533
Long Term Debt		0	9,430,013	32,978,950	63,746,114	78,025,621	78,025,621	71,523,486	65,021,351	58,519,216	52,017,081
Additional debt due to currency rate			0	18,750,300	33,472,739	37,471,446	39,711,802	38,219,296	36,195,239	33,795,098	31,048,132
Other Funds	99,934	922,559	3,898,736	6,119,337	7,873,123	8,782,766	9,324,309	9,899,986	10,509,798	11,158,357	11,846,586
Total Long Term Liabilities	99,934	922,559	13,328,750	57,848,595	105,091,976	124,279,834	127,061,732	119,642,769	111,726,388	103,472,671	94,911,800
Other Liabilities & Equity											
Net Revaluation Surplus		810,418	3,433,696	11,261,217	26,016,485	38,726,451	47,512,559	56,463,286	65,532,477	74,739,463	84,044,325
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727	17,727
Retained Earnings	0	10,971	(4,145,115)	(27,529,185)	(43,003,911)	(43,499,651)	(41,087,213)	(40,752,621)	(41,971,737)	(42,539,158)	(42,532,965)
Net Equity	17,727	839,116	(693,693)	(16,250,242)	(16,969,699)	(4,755,473)	6,443,073	15,728,391	23,578,468	32,218,032	41,529,087
TOTAL LIABILITIES & EQUITY	342,359	5,537,491	23,430,465	75,658,932	151,023,361	185,029,901	201,856,774	206,[illegible],061	209,232,676	212,676,616	216,492,419

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		10,971	(4,156,087)	(23,384,070)	(15,474,726)	(495,739)	4,824,875	669,184	(1,219,115)	(567,421)	12,385
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,766	6,692,956	7,105,224	7,543,687	8,008,969
Currency fluctuation loss on L/T debt			0	18,750,300	14,722,439	3,998,707	2,240,356	1,981,976	1,740,509	1,625,843	1,512,068
Changes in assets and liabilities:											
Accounts receivable		(1,742,404)	(3,575,511)	(12,056,606)	(15,233,811)	(1,477,685)	(1,488,674)	(1,517,459)	(1,351,441)	(1,567,581)	(1,571,381)
Materials and supplies		(84,976)	(307,434)	(229,384)	(181,163)	(93,985)	(55,940)	(59,466)	(62,992)	(66,995)	(71,093)
Other assets		(24,695)	(89,344)	(66,662)	(52,648)	(27,307)	(16,257)	(17,262)	(18,306)	(19,470)	(20,661)
Accounts payable		3,551,117	7,019,593	23,265,170	28,840,507	2,604,455	2,848,429	2,903,931	2,672,120	3,057,893	3,065,620
Other funds		822,625	2,976,177	2,220,601	1,753,790	909,644	541,542	575,677	609,812	648,559	688,229
Net cash provided by operations		2,628,340	2,641,169	10,787,237	18,928,695	11,355,762	15,196,096	11,229,517	9,475,811	10,654,515	11,624,137
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,650,192)	(8,652,868)	(17,554,509)	(11,434,850)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(9,430,013)	(23,548,944)	(30,767,156)	(14,279,507)	0	0	0	0	0
Net cash used in investing activities		0	(11,080,205)	(32,201,812)	(48,321,665)	(25,714,357)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
Loss on Currency Fluctuation		0	0	0	0	0	0	(3,474,481)	(3,764,566)	(4,025,985)	(4,259,034)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(2,412,437)	(334,592)	0	0	(6,193)
Net cash provided (used in) financing activities		0	9,430,013	23,548,944	30,767,156	14,279,507	(2,412,437)	(10,311,208)	(10,266,701)	(10,528,120)	(10,767,361)
Net increase (decrease) in cash and cash equivalents		2,628,340	990,977	2,134,368	1,374,188	(79,088)	12,783,659	918,309	(790,891)	126,395	856,776
Cash and cash equivalents–beginning		76,824	2,705,164	3,696,141	5,830,509	7,204,695	7,125,607	19,909,266	20,827,575	20,036,684	20,163,079
Cash and cash equivalents–ending		2,705,164	3,696,141	5,830,509	7,204,695	7,125,607	19,909,266	20,827,575	20,036,684	20,163,079	21,019,855

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	293,943	310,999	2,871,046	23,213,244	68,636,609	136,629,342	178,129,559	189,112,968	200,788,687	213,156,716	226,310,611
Reevaluation Rate	0.000	6.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	293,943	2,871,046	12,133,039	36,434,797	88,307,677	152,415,202	189,112,968	200,788,687	213,156,716	226,310,611	240,269,083
New Investments (Current Year)	0	0	11,080,205	32,201,812	48,321,665	25,714,357	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	17,056										
Ending Value of Assets (Gross)	310,999	2,871,046	23,213,244	68,636,609	136,629,342	178,129,559	189,112,968	200,788,687	213,156,716	226,310,611	240,269,083
Accumulated Depreciation		212,548	2,057,878	9,470,369	17,152,287	26,622,398	35,635,944	44,137,010	53,554,959	63,959,020	75,449,617
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	212,548	1,962,177	8,696,594	14,864,400	22,068,087	29,698,292	37,833,245	46,862,002	56,853,706	67,905,930	80,103,227
Current Depreciation		95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,766	6,692,956	7,105,224	7,543,687	8,008,969
Net Value of Assets	98,451	813,167	13,742,876	51,484,322	110,003,943	142,493,615	144,975,957	147,233,728	149,197,696	150,860,994	152,156,887
Accum. Revaluation Surplus		2,560,047	11,822,0[illegible]	25,043,592	44,714,660	60,500,520	71,483,929	83,159,648	95,527,677	108,681,572	122,640,044
Accum. Reevaluated Depreciation		1,749,[illegible]29	8,388,344	13,782,376	18,698,175	21,774,070	23,971,370	26,696,362	29,995,200	33,942,109	38,595,719
Net Reevaluation Surplus		810,418	3,433,696	11,261,217	26,016,485	38,726,451	47,512,559	56,463,286	65,532,477	74,739,463	84,044,325

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	105,062	103,440	100,677	103,002	104,974	106,600	107,895	108,873	105,110	103,417	101,721
Other	2,049,100	2,003,059	1,957,995	1,912,641	1,930,052	1,943,414	1,964,912	1,982,933	1,991,301	2,008,438	2,022,641
Total	2,155,162	2,106,499	2,058,672	2,015,643	2,035,026	2,050,014	2,072,807	2,091,806	2,096,411	2,111,855	2,124,362
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.1%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	104,577	101,992	100,677	103,002	104,974	106,600	107,895	108,873	105,110	103,417	101,721
Other	2,020,413	1,975,016	1,937,436	1,899,253	1,923,297	1,943,414	1,964,912	1,982,933	1,991,301	2,008,438	2,022,641
Total	2,124,990	2,077,008	2,038,113	2,002,255	2,028,271	2,050,014	2,072,807	2,091,806	2,096,411	2,111,855	2,124,362
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,837
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,860	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,386	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.80%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		719	2,385	3,741	4,005	4,641	4,960	5,118	5,255	5,401	5,558
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		6.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		1.3%	−30.2%	−45.4%	−14.1%	−0.3%	3.3%	0.5%	−0.8%	−0.4%	0.0%
Average over Period 1998–2002							0.5%				
External Financing		0.0%	88.9%	79.2%	72.1%	68.8%	68.8%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993–US$ x 000)			293.00	1625.00	2941.00	1869.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			297	1,684	3,144	2,067	0	0	0	0	0
Duties on Foreign Suppliers			471,501	1,177,447	1,538,358	713,975	0	0	0	0	0
Domestic Supplier (Current–Rubles x 000)			1,178,691	7,475,421	16,016,151	10,720,874	0	0	0	0	0
Foreign Supplier (1993–US$ x 000)			3907.00	6149.00	6250.00	2667.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			3,954	6,370	6,681	2,950	0	0	0	0	0
Foreign Supplier (Current–Rubles x 000)			9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		106,673	(3,382,312)	(21,096,183)	(10,920,415)	5,441,912	11,128,641	7,362,140	5,886,109	6,976,266	8,021,355
Less Retirements			0	0	0	0	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
Less Domestic Suppliers		0	(1,650,192)	(8,652,868)	(17,554,509)	(11,434,850)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(2,412,437)	(334,592)	0	0	(6,193)
Funds Available/(Required)		106,673	(5,032,504)	(29,749,051)	(28,474,923)	(5,992,937)	8,716,203	525,413	(616,027)	474,131	1,513,027
External Sources (Foreign Projects)		0	9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Accumulative Long–Term Debt			9,430,013	32,978,958	63,746,114	78,025,621	78,025,621	71,523,486	65,021,351	58,519,216	52,017,081
Retirements								6,502,135	6,502,135	6,502,135	6,502,135
Interest			471,501	2,120,449	4,836,254	7,088,587	7,802,552	7,477,455	6,827,242	6,177,028	5,526,815
Memo: Total Project		0	10,608,705	41,633,070	88,416,377	113,416,759	113,416,759	113,416,759	113,416,759	113,416,759	113,416,759
Memo: % Externally Financed		0.0%	88.9%	79.2%	72.1%	68.8%	68.8%				
Computation of ending retained earnings:											
Beginning retained earnings		0	10,971	(4,145,115)	(27,529,185)	(43,003,911)	(43,499,651)	(41,087,213)	(40,752,621)	(41,971,737)	(42,539,158)
adjusted net income		10,971	(4,156,087)	(23,384,070)	(15,474,726)	(495,739)	4,824,875	669,184	(1,219,115)	(567,421)	12,385
less: dividends		0	0	0	0	0	(2,412,437)	(334,592)	0	0	(6,193)
Ending retained earnings – to B/S		10,971	(4,145,115)	(27,529,185)	(43,003,911)	(43,499,651)	(41,087,213)	(40,752,621)	(41,971,737)	(42,539,158)	(42,532,965)

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			10,608,705								
VAT Payment			2,121,741								
VAT Recapture				(1,060,870)	(1,060,870)						
1995 Investment				31,024,365							
VAT Payment				6,204,873							
VAT Recapture					(3,102,437)	(3,102,437)					
1995 Investment					46,783,307						
VAT Payment					9,356,661						
VAT Recapture						(4,678,331)	(4,678,331)				
1996 Investment						25,000,382					
VAT Payment						5,000,076					
VAT Recapture							(2,500,038)	(2,500,038)			
Value Added Tax on Projects		0	2,121,741	6,204,873	9,356,661	5,000,076	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,060,870)	(4,163,307)	(7,780,767)	(7,178,369)	(2,500,038)	0	0	0
Net V.A.T. on Projects		0	2,121,741	5,144,003	5,193,354	(2,780,691)	(7,178,369)	(2,500,038)	0	0	0
On Sales											
(a) GAS & LPG Purchases		19,088,992	54,577,207	172,196,477	318,002,387	331,169,456	345,[illegible],851	360,240,949	373,750,103	389,209,570	404,708,100
(b) Commodity = = Purchases / (1+VAT Rate)		15,907,493	45,481,006	143,497,064	265,001,989	275,974,548	287,986,543	300,200,791	311,458,419	324,341,308	337,256,750
(c) VAT Included = Line (b) – Line (b)		3,181,499	9,096,201	28,699,413	53,000,398	55,194,910	57,503,309	60,040,158	62,291,[illegible]	64,868,262	67,451,350
(d) GAS & LPG Sales		21,544,036	62,168,624	199,154,[illegible]5	372,239,542	389,028,[illegible]5	405,943,011	423,184,224	438,539,156	456,319,846	474,203,716
(e) Commodity = = Purchases / (1+VAT Rate)		17,953,364	51,807,186	165,962,121	310,199,618	324,190,704	338,285,842	352,652,520	365,449,298	380,291,538	395,169,764
(f) VAT Included = Line (d) – Line (e)		3,590,673	10,361,437	33,192,424	62,039,924	64,838,141	67,657,168	70,530,704	73,089,859	76,058,308	79,033,953
(g) Utility's VAT Liability = Line (f) – Line (c)		409,174	1,265,236	4,493,011	9,039,526	9,643,231	10,063,860	10,490,546	10,798,175	11,190,046	11,582,603
Test											
Margin on GAS & LPG Sales		2,455,045	7,591,417	26,958,369	54,237,154	57,659,387	60,383,160	62,943,275	64,789,052	67,140,276	69,495,616
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

RYAZAN

Case–B–4

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			32,978,958	63,746,114	78,025,621	78,025,621	71,523,486	65,021,351	58,519,216	52,017,081
Beginning ruble/US$ exchange rate			$0.000419287	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179921
Decline in value			$0.000151979	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005230
Additional ruble debt/expense to record – in US$			5,012	3,197	826	450	387	331	301	272
Additional ruble debt/expense to record – in rubles			18,750,300	14,722,439	3,998,707	2,240,356	1,981,976	1,740,509	1,625,843	1,512,068
cumulative			18,750,300	33,472,739	37,471,446	39,711,802	41,693,778	43,434,287	45,060,130	46,572,198
Computation of payment on additional L/T debt – 1/12th cumulative							3,474,431	3,764,566	3,025,085	4,259,034
							3,474,481	7,239,048	11,265,033	15,524,066

12–Jan–94

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Case–R–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	17.2%	9.8%	12.1%	5.5%	3.4%	3.1%	3.0%	3.1%	3.2%	3.4%	3.5%
Short–Term Investments	5.2%	39.0%	3.6%	2.2%	1.3%	0.8%	6.9%	7.0%	6.4%	6.1%	6.2%
Cash & Investments	22.4%	48.9%	15.8%	7.7%	4.8%	3.9%	9.9%	10.1%	9.6%	9.5%	9.7%
Accounts receivable	44.9%	34.2%	23.4%	23.2%	21.7%	18.5%	17.7%	18.0%	18.4%	18.9%	19.3%
Materials & equipment	3.0%	1.7%	1.7%	0.8%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%
Other assets	0.9%	0.5%	0.5%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%
Total Current Assets	71.2%	85.3%	41.3%	32.0%	27.2%	23.0%	28.2%	28.7%	28.7%	29.1%	29.7%
Fixed assets											
Adjusted Cost of Fixed Assets	90.8%	51.[illegible]%	99.1%	90.7%	90.5%	96.3%	93.7%	97.2%	101.9%	106.4%	111.0%
Less: Accumulated Depreciation	62.1%	37.2%	40.4%	22.7%	17.6%	19.3%	21.9%	25.9%	30.0%	35.5%	40.7%
Net Revalued Assets	28.8%	14.7%	58.7%	68.0%	72.8%	77.0%	71.8%	71.3%	71.3%	70.9%	70.3%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	65.6%	68.2%	46.1%	45.0%	41.6%	35.4%	33.9%	34.5%	35.3%	36.2%	37.0%
Total Current Liabilities	65.6%	68.2%	46.1%	45.0%	41.6%	35.4%	33.9%	34.5%	35.3%	36.2%	37.0%
Long Term Debt	0.0%	0.0%	40.2%	43.6%	42.2%	42.2%	38.7%	34.6%	31.1%	27.5%	24.0%
Additional debt due to currency rate	0.0%	0.0%	0.0%	24.8%	22.2%	20.3%	19.7%	18.5%	17.3%	15.9%	14.3%
Interim Financing	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
Other Funds	29.2%	16.7%	16.6%	8.1%	5.2%	4.7%	4.6%	4.8%	5.0%	5.2%	5.5%
Total Long Term Liabilities	29.2%	16.7%	56.9%	76.5%	69.6%	67.2%	62.9%	57.9%	53.4%	48.7%	43.8%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	14.6%	14.7%	14.9%	17.2%	20.9%	23.5%	27.3%	31.3%	35.1%	38.8%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	5.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	0.2%	−17.7%	−36.4%	−28.5%	−23.5%	−20.4%	−19.7%	−20.1%	−20.0%	−19.6%
Net Equity	5.2%	15.2%	−3.0%	−21.5%	−11.2%	−2.6%	3.2%	7.6%	11.3%	15.1%	19.2%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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Case–R–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	243,908	4,724,323	9,687,588	24,174,609	41,016,417	42,536,285	56,880,816	59,393,332	60,035,181	61,815,621	64,335,531
Current liabilities	224,698	3,775,815	10,795,408	34,060,578	62,901,085	65,505,540	68,351,970	71,255,901	73,923,021	76,985,913	80,051,533
Working capital	19,210	948,508	(1,107,820)	(9,885,969)	(21,884,668)	(22,969,255)	(11,471,154)	(11,862,569)	(13,892,840)	(15,170,292)	(15,716,002)
Change in working capital		929,397	(2,056,327)	(8,778,150)	(11,998,699)	(1,084,587)	11,498,101	(391,415)	(2,030,271)	(1,277,453)	(545,710)
Current ratio	1.09	1.25	0.90	0.71	0.65	0.65	0.83	0.83	0.81	0.80	0.80
Capitalization Table:											
Debt	99,934	922,559	13,328,750	57,848,595	105,091,976	124,279,834	127,061,732	119,642,759	111,726,388	103,472,671	94,911,800
Equity	17,727	839,116	(693,693)	(16,250,242)	(16,989,699)	(4,755,473)	6,443,073	15,728,391	23,578,468	32,218,032	41,529,087
Percent debt	84.9%	52.4%	105.5%	139.1%	119.3%	104.0%	95.2%	88.4%	82.6%	76.3%	69.6%
Percent equity	15.1%	47.6%	−5.5%	−39.1%	−19.3%	−4.0%	4.8%	11.6%	17.4%	23.7%	30.4%
Times Interest Earned:											
Net income	57,263	10,971	(4,156,087)	(23,084,070)	(15,474,726)	(495,739)	4,824,875	669,184	(1,212,115)	(567,421)	12,385
Add back: Interest expense	0	0	471,501	2,120,449	4,836,254	7,088,587	7,802,562	7,477,455	6,827,242	6,177,028	5,526,815
depreciation	0	95,702	773,775	2,287,887	4,554,311	5,937,652	6,303,766	6,692,956	7,105,224	7,543,687	8,008,969
taxes	47,893	597,289	2,194,207	28,448,984	36,144,263	29,331,231	29,249,358	29,530,790	29,135,630	28,996,932	28,863,175
total	105,156	703,962	(716,604)	9,473,250	30,060,102	41,861,730	48,180,561	44,370,385	41,848,981	42,152,226	42,411,345
Interest	0	0	471,501	2,120,449	4,836,254	7,088,587	7,802,562	7,477,455	6,827,242	6,177,028	5,526,815
Time interest earned			−1.5	4.5	6.2	5.9	6.2	5.9	6.1	6.8	7.7
Operating revenue	1,747,019	21,544,036	62,163,624	199,154,545	372,239,542	389,028,845	405,943,011	423,184,224	438,539,156	456,349,846	474,203,716
Operating expenses (B4 depr, tax)	1,258,443	20,219,514	59,351,792	179,695,227	327,650,260	341,932,025	356,986,034	372,372,577	386,629,007	402,883,230	419,225,130
Operating margin	488,576	1,324,523	2,813,832	19,459,318	44,589,282	47,096,820	48,956,977	50,811,646	51,910,149	53,466,616	54,978,586
Percent	28.0%	6.1%	4.5%	9.8%	12.0%	12.1%	12.1%	12.0%	11.8%	11.7%	11.6%
Net income to total revenue	3.3%	0.1%	−6.7%	−11.7%	−4.2%	−0.1%	1.2%	0.2%	−0.3%	−0.1%	0.0%
Return on total assets	16.7%	0.2%	−17.7%	−30.9%	−10.2%	−0.3%	2.4%	0.3%	−0.6%	−0.3%	0.0%
Return on beginning equity		61.9%	−495.3%	3371.0%	95.2%	2.9%	−101.5%	10.4%	−7.8%	−2.4%	0.0%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%	50.0%
Accum. Deprec. / Assets	68.3%	71.7%	40.8%	25.0%	19.5%	20.0%	23.3%	26.7%	30.0%	33.3%	36.7%
Receivables / Sales	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%	8.8%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case–R–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		2,628,340	990,977	2,134,369	1,374,186	(79,088)	12,783,659	918,309	(790,890)	126,395	856,776
Accounts receivable		1,742,404	3,575,511	12,056,606	15,233,811	1,477,685	1,488,674	1,517,459	1,351,441	1,567,581	1,571,381
Materials & equipment		84,976	307,434	229,384	181,163	93,965	55,940	59,466	62,992	66,995	71,093
Other assets		24,695	89,344	66,662	52,648	27,307	16,257	17,282	18,306	19,470	20,661
Net fixed assets		714,716	12,929,708	37,741,446	58,522,622	32,486,671	2,482,343	2,257,771	1,963,968	1,663,299	1,295,892
		5,195,131	17,892,974	52,229,467	75,364,430	34,006,540	16,826,873	4,770,287	2,605,817	3,443,740	3,815,803
Credits:											
Accounts payable		3,551,117	7,019,593	23,265,170	28,840,507	2,604,455	2,846,429	2,903,931	2,672,120	3,057,893	3,065,620
Long term debt		0	9,430,013	23,548,944	30,767,156	14,279,507	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
Currency fluctuation on L/T debt			0	18,750,300	14,722,439	3,998,707	2,240,356	(1,492,505)	(2,024,057)	(2,400,142)	(2,746,965)
Other funds		822,635	2,978,177	2,220,601	1,753,786	909,644	541,542	575,677	609,812	648,559	688,229
Equity/retained earnings		821,389	(1,532,809)	(15,556,549)	(719,458)	12,214,226	11,198,546	9,265,319	7,850,076	8,639,564	9,311,054
		5,195,131	17,892,974	52,228,466	75,364,430	34,006,539	16,826,873	4,770,287	2,605,816	3,443,739	3,815,803
check: net change debts and credits		0	0	(1)	0	(1)	0	0	(1)	(1)	0
Does balance sheet balance?		1	1	1	1	2	1	1	(0)	1	2
check: analysis of change in fixed assets		(0)	(0)	(0)	(0)	0	0	0	0	0	(0)
check: analysis of change in equity/RE		(0)	(0)	0	(0)	(0)	0	0	(0)	(0)	(0)
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	0	0	(0)	0	(0)	0
Analysis of change in net fixed assets:											
Revaluation write up of assets		2,560,047	9,261,993	13,221,552	19,671,068	15,785,860	10,983,409	11,675,719	12,368,029	13,153,895	13,958,472
Revaluation of accum depreciation		(1,749,629)	(6,638,715)	(5,394,032)	(4,915,799)	(3,075,895)	(2,197,300)	(2,724,992)	(3,298,838)	(3,946,909)	(4,653,610)
Current depreciation		(95,702)	(773,775)	(2,267,887)	(4,554,311)	(5,937,652)	(6,303,766)	(6,692,956)	(7,105,224)	(7,543,687)	(8,008,969)
New capital expenditures, net		0	11,080,205	32,201,812	48,321,665	25,714,357	0	0	0	0	0
		714,716	12,929,708	37,741,446	58,522,622	32,486,671	2,482,343	2,257,771	1,963,968	1,663,299	1,295,892
Analysis of change in net equity/RE											
Net income		10,971	(4,156,087)	(23,384,070)	(15,474,726)	(495,739)	4,824,875	669,184	(1,219,115)	(567,421)	12,385
Revaluation surplus (direct cr. to equity)		2,560,047	9,261,993	13,221,552	19,671,068	15,785,860	10,983,409	11,675,719	12,368,029	13,153,895	13,958,472
Revaluation of accum depreciation		(1,749,629)	(6,638,715)	(5,394,032)	(4,915,799)	(3,075,895)	(2,197,300)	(2,724,992)	(3,298,838)	(3,946,909)	(4,653,610)
Dividends declared		0	0	0	0	0	(2,412,437)	(334,592)	0	0	(6,193)
		821,339	(1,532,809)	(15,556,549)	(719,458)	12,214,226	11,198,546	9,265,319	7,850,076	8,639,564	9,311,054
Analysis of change in long term debt:											
New debt issued		0	9,430,013	23,548,944	30,767,156	14,279,507	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)
		0	9,430,013	23,548,944	30,767,156	14,279,507	0	(6,502,135)	(6,502,135)	(6,502,135)	(6,502,135)

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SARATOV

Case – S – 1

INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		426,852	2,554,048	15,029,820	36,456,803	36,520,729	36,483,891	36,393,967	36,310,544	37,008,397	37,711,700
Natural Gas, Other		30,891,114	87,538,972	279,343,258	514,600,556	537,181,185	562,355,074	587,793,710	611,511,049	639,181,658	666,813,873
Natural Gas, Total		31,317,965	90,093,020	294,373,078	551,057,359	573,701,914	598,818,966	624,187,677	647,821,592	676,190,055	704,525,573
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	2,025,403	31,327,843	90,134,765	294,438,599	551,141,658	573,795,953	598,918,803	624,293,678	647,934,122	676,309,530	704,652,416
Other Revenues	2,822	23,230	98,169	154,083	198,243	221,148	234,784	249,279	264,675	280,965	298,294
TOTAL OPERATING INCOME	**2,028,225**	**31,351,073**	**90,232,934**	**294,592,682**	**551,339,001**	**574,017,101**	**599,153,587**	**624,542,957**	**648,198,757**	**676,590,495**	**704,950,711**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		153,007	919,457	5,410,735	13,124,449	13,147,462	13,127,001	13,101,828	13,071,796	13,323,023	13,576,212
Natural Gas, Other		27,528,460	78,009,913	248,935,335	458,583,688	478,706,302	501,139,886	523,809,397	544,944,964	569,603,508	594,227,817
Natural Gas, Total		27,684,467	78,929,371	254,346,070	471,708,137	491,853,764	514,266,887	536,911,225	558,016,760	582,926,531	607,804,029
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,709,700	27,709,983	79,037,200	254,515,316	471,925,888	492,096,674	514,524,774	537,185,035	558,307,455	583,235,144	608,131,676
Payroll (Wages & Bonus)	41,268	380,973	1,609,993	2,526,996	3,251,226	3,626,866	3,850,497	4,088,224	4,340,048	4,607,872	4,892,078
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	62,379	575,863	2,433,599	3,819,702	4,914,419	5,482,220	5,820,252	6,179,591	6,560,237	6,965,069	7,394,663
TOTAL OPERATING EXPENSES	**1,813,347**	**28,666,819**	**83,080,792**	**260,862,014**	**480,091,533**	**501,205,760**	**524,195,524**	**547,452,850**	**569,207,739**	**594,808,084**	**620,418,417**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**214,878**	**2,684,254**	**7,152,142**	**33,730,669**	**71,248,368**	**72,811,341**	**74,958,063**	**77,090,107**	**78,991,017**	**81,782,410**	**84,532,293**

SARATOV

Case – S – 1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
DEDUCTIONS											
Depreciation		167,912	893,612	2,137,763	4,179,519	5,569,868	5,913,305	6,278,389	6,665,120	7,076,424	7,512,887
Value Added Tax (on Sales)	83,720	602,977	1,849,594	6,653,881	13,202,628	13,616,546	14,065,671	14,518,107	14,937,7[illegible]6	15,512,398	16,086,790
Net Value Added Tax (on Projects)		0	1,054,769	3,719,106	5,652,564	(971,240)	(6,803,398)	(2,651,801)	0	0	0
Gas Rehabilitation Fund		361,786	1,109,756	3,992,328	7,921,577	8,169,928	8,439,403	8,710,864	8,962,667	9,307,439	9,652,074
TOTAL DEDUCTIONS	83,720	1,132,675	4,907,732	16,503,083	30,956,289	26,385,103	21,614,981	26,855,558	30,565,565	31,896,261	33,251,751
NET INCOME BEFORE INTEREST and TAXES	131,158	1,567,210	2,310,495	17,331,311	40,425,532	46,575,109	53,501,133	50,402,357	48,603,596	50,075,268	51,481,347
INTEREST and TAXES											
Interest Expenses		0	246,578	1,316,163	3,495,386	5,557,279	6,262,955	6,001,999	5,480,086	4,958,173	4,436,260
Currency fluctuation loss on debt			0	9,071,317	11,204,983	3,209,679	1,798,287	1,590,691	1,397,071	1,305,031	1,196,245
Taxes:											
Corporate Income Tax	64,943	858,981	2,288,685	10,793,814	22,799,478	23,299,629	23,988,580	24,668,834	25,277,126	26,170,371	27,050,334
Excess Payroll Tax	6,970	74,290	313,949	492,764	633,989	707,239	750,847	797,204	846,309	898,535	953,955
Property Tax		77,816	574,402	769,388	1,723,456	2,804,470	3,172,608	3,451,255	3,631,616	3,795,543	3,974,550
Road Tax		14,471	44,390	159,693	316,863	326,797	337,576	348,435	358,507	372,298	386,083
TOTAL INTEREST and TAXES	71,913	1,025,538	3,466,004	22,603,139	40,174,155	35,905,093	36,308,853	36,858,617	36,990,714	37,499,950	37,999,426
NET INCOME	59,245	541,678	(1,157,509)	(5,271,828)	251,377	10,670,016	17,192,280	13,543,740	11,612,884	12,575,338	13,481,921
Memo: Weighted Ave Cost of Gas		8,872	25,982	84,304	154,861	160,369	165,777	171,515	177,588	183,594	189,789
Memo: Weighted Ave Sales Price of Gas		10,189	30,077	98,955	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,182	3,727	13,455	28,421	27,067	27,646	28,280	28,991	29,798	30,637
Memo: Cash Flow From Natural Gas		3,633,499	11,163,650	40,027,008	79,349,222	81,848,150	84,552,079	87,276,451	89,804,812	93,263,524	96,721,544
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	223,965	2,067,575	10,805,147	15,781,800	19,712,260	21,750,889	22,964,555	24,254,722	25,621,389	27,074,894	28,617,305
Short–Term Investments	300	4,118,070	8,521,017	29,084,867	52,955,571	62,098,4[illegible]	81,277,241	91,377,132	100,315,385	110,232,747	120,768,858
Cash & Short Term Investments	224,265	6,185,645	19,326,163	44,866,667	72,667,831	83,849,383	104,241,797	115,631,854	125,936,774	137,307,641	149,386,163
Accounts receivable – Gross *(See Note C)*	298,783	4,621,415	13,296,482	43,434,935	81,303,206	84,645,118	88,351,186	92,094,432	95,581,818	99,767,696	103,948,776
Materials & equipment	17,563	162,136	685,187	1,075,449	1,383,670	1,543,536	1,638,710	1,739,883	1,847,055	1,961,037	2,081,990
Other assets	387	3,573	15,098	23,697	30,489	34,012	36,109	38,338	40,700	43,211	45,877
Total Current Assets	540,998	10,972,768	33,322,931	89,400,748	155,385,196	170,072,049	194,267,801	209,504,507	223,406,346	239,079,584	255,462,806
Fixed assets											
Adjusted Cost of Fixed Assets	545,661	5,037,372	26,808,359	64,133,040	125,385,593	167,096,054	177,399,141	188,351,655	199,953,598	212,292,729	225,386,600
Less: Accumulated Depreciation	243,740	2,418,044	11,112,266	19,579,240	29,370,117	38,333,345	46,610,271	55,766,349	65,866,523	77,007,568	89,270,157
Net Revalued Assets	301,921	2,619,328	15,696,093	44,553,800	96,015,466	128,762,709	130,788,869	132,585,306	134,087,075	135,285,160	136,116,443
TOTAL ASSETS	842,919	13,592,096	49,019,025	133,954,548	251,400,662	298,834,758	325,056,671	342,089,812	357,493,421	374,364,745	391,579,249
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	478,875	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,787	150,461,767	156,378,009	163,360,080	170,333,425
Total Current Liabilities	478,875	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,787	150,461,767	156,378,009	163,360,080	170,333,425
Long Term Debt		0	4,931,562	21,391,696	48,516,021	62,629,550	62,629,550	57,410,421	52,191,291	46,972,162	41,753,033
Additional debt due to currency rate			0	9,071,317	20,276,300	23,485,979	25,284,266	24,635,561	23,560,190	22,182,944	20,517,002
Other Funds	298,377	2,736,060	11,562,589	18,148,286	23,349,536	26,047,291	27,653,358	29,360,659	31,169,195	33,092,645	35,133,746
Total Long Term Liabilities	298,377	2,736,060	16,494,151	48,611,298	92,141,856	112,162,820	115,567,174	111,406,641	106,920,676	102,247,751	97,403,781
Other Liabilities & Equity											
Net Revaluation Surplus		2,485,319	10,935,272	19,875,285	32,644,285	43,737,705	51,677,170	59,751,995	67,918,884	76,193,394	84,537,563
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529
Retained Earnings	56,138	597,816	(559,693)	(5,831,521)	(5,580,144)	5,089,873	13,686,013	20,457,882	26,264,324	32,551,993	39,292,954
Net Equity	67,667	3,094,665	10,387,107	14,055,293	27,075,670	48,839,107	65,374,712	80,221,407	94,194,738	108,756,916	123,842,046
TOTAL LIABILITIES & EQUITY	842,919	13,592,097	49,019,025	133,954,549	251,400,663	298,834,759	325,056,673	342,089,615	357,493,424	374,364,748	391,579,252

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		541,676	(1,157,509)	(5,271,826)	251,377	10,670,016	17,192,280	13,543,740	11,612,884	12,575,338	13,481,921
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		167,912	893,612	2,137,768	4,179,519	5,569,868	5,913,305	6,278,389	6,665,120	7,076,424	7,512,887
Currency fluctuation loss on L/T debt			0	9,071,317	11,204,983	3,209,379	1,798,287	1,590,891	1,397,071	1,305,031	1,198,245
Changes in assets and liabilities:											
Accounts receivable		(4,322,632)	(8,675,068)	(30,138,453)	(37,868,271)	(3,341,912)	(3,706,068)	(3,743,246)	(3,487,386)	(4,185,878)	(4,181,080)
Materials and supplies		(144,573)	(523,051)	(390,262)	(308,221)	(159,866)	(95,174)	(101,173)	(107,172)	(113,982)	(120,954)
Other assets		(3,186)	(11,525)	(8,599)	(6,792)	(3,523)	(2,097)	(2,229)	(2,362)	(2,512)	(2,665)
Accounts payable		7,282,497	14,376,394	49,150,192	60,895,179	5,649,696	6,281,954	6,346,980	5,918,242	6,982,071	6,973,344
Other funds		2,439,683	8,826,529	6,585,606	5,201,250	2,697,755	1,606,067	1,707,301	1,808,536	1,923,450	2,041,101
Net cash provided by operations		5,961,380	13,729,361	31,135,631	43,549,025	24,291,714	28,988,554	25,620,653	23,802,932	25,559,941	26,902,798
Cash flows from investing activities:											
Note: Does not include internally – funded routine capital expenditures.											
Capital expenditures – Domestic		0	(588,863)	(5,595,327)	(15,747,861)	(13,110,162)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(4,931,562)	(16,460,134)	(27,124,325)	(14,113,529)	0	0	0	0	0
Net cash used in investing activities		0	(5,520,425)	(22,055,461)	(42,872,186)	(27,223,691)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	4,931,562	16,460,134	27,124,325	14,113,529	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(5,219,129)	(5,219,129)	(5,219,129)	(5,219,129)
Loss on Currency Fluctuation		0	0	0	0	0	0	(2,239,596)	(2,472,442)	(2,682,277)	(2,864,186)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(8,596,140)	(6,771,870)	(5,808,442)	(6,287,669)	(6,740,960)
Net cash provided (used in) financing activities		0	4,931,562	16,460,134	27,124,325	14,113,529	(8,596,140)	(14,230,596)	(13,498,013)	(14,189,075)	(14,824,276)
Net increase (decrease) in cash and cash equivalents		5,961,380	13,140,516	25,540,504	27,801,164	11,181,552	20,392,414	11,390,057	10,304,920	11,370,867	12,078,522
Cash and cash equivalents – beginning		224,265	6,185,645	19,326,163	44,866,667	72,667,031	83,849,383	104,241,797	115,631,854	125,936,774	137,307,641
Cash and cash equivalents – ending		6,185,645	19,326,163	44,866,667	72,667,831	83,849,383	104,241,797	115,631,854	125,936,774	137,307,641	149,386,163

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	544,513	545,661	5,037,372	26,808,359	64,133,040	125,365,583	167,096,054	177,399,141	188,351,655	199,953,598	212,292,729
Reevaluation Rate	0.000	8.232	3.226	0.570	0.267	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	544,513	5,037,372	21,267,934	42,077,579	82,513,397	139,872,363	177,399,141	188,351,655	199,953,598	212,292,729	225,366,600
New Investments (Current Year)	0	0	5,520,425	22,055,461	42,872,186	27,223,691	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	1,148										
Ending Value of Assets (Gross)	545,661	5,037,372	26,808,359	64,133,040	125,365,583	167,096,054	177,399,141	188,351,655	199,953,598	212,292,729	225,366,600
Accumulated Depreciation		243,740	2,418,044	11,112,266	19,579,240	29,370,117	38,333,345	46,610,271	55,768,349	65,866,523	77,007,566
Reevaluation Rate		8.232	3.226	0.570	0.267	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	243,740	2,250,132	10,218,654	17,441,472	25,190,597	32,763,477	40,696,967	49,487,961	59,201,403	69,931,144	81,757,270
Current Depreciation		167,912	893,612	2,137,768	4,179,519	5,569,868	5,913,305	6,278,389	6,665,120	7,076,424	7,512,887
Net Value of Assets	301,921	2,619,328	15,698,093	44,553,600	96,015,466	128,782,709	130,788,859	132,585,306	134,087,075	135,285,160	136,116,443
Accum. Revaluation Surplus		4,491,711	20,742,273	36,011,493	54,391,850	68,878,630	79,181,717	90,134,231	101,736,174	114,075,304	127,169,178
Accum. Reevaluated Depreciation		2,006,392	9,807,002	16,136,207	21,747,565	25,140,925	27,504,546	30,382,226	33,617,289	37,881,911	42,631,613
Net Reevaluation Surplus		2,485,319	10,935,272	19,875,285	32,644,285	43,737,705	51,677,170	59,751,995	67,918,884	76,193,394	84,537,563

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas -- Purchases											
Residential	222,285	216,673	210,817	204,805	198,692	192,495	186,236	179,941	173,625	171,309	168,988
Other	2,982,874	2,903,846	2,826,989	2,812,209	2,847,317	2,874,515	2,915,916	2,950,458	2,968,572	3,003,779	3,033,529
Total	3,205,159	3,120,522	3,037,806	3,017,014	3,046,009	3,067,010	3,102,152	3,130,399	3,142,197	3,175,088	3,202,517
Losses (%)											
Residential	1.5%	1.5%									
Other	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Natural Gas -- Sales											
Residential	218,951	213,426	210,817	204,805	198,692	192,495	186,236	179,941	173,625	171,309	168,988
Other	2,938,131	2,860,288	2,784,584	2,770,026	2,804,607	2,831,397	2,872,177	2,906,201	2,924,043	2,958,722	2,986,026
Total	3,157,082	3,073,714	2,995,401	2,974,831	3,003,299	3,023,892	3,058,413	3,086,142	3,097,668	3,130,031	3,157,014
(Tons)											
LPG -- Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%
LPG -- Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas -- Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,468	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas -- Sales Prices											
Residential		2,000	12,115	73,356	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG -- Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG -- Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG -- Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,960	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Revaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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Case–S–1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		20.7%	−7.4%	−11.8%	0.3%	8.3%	13.1%	10.2%	8.7%	9.3%	9.9%
Average over Period 1998–2002							10.2%				
External Financing		0.0%	93.5%	80.7%	71.3%	66.2%	66.2%				

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Case-S-1

FUNDING OF PROJECTS	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Proposed Project											
Domestic Supplier (1993-US$ x 000)			36.00	1019.00	2648.00	2185.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			36	1,056	2,831	2,417	0	0	0	0	0
Duties on Foreign Suppliers			246,578	823,007	1,356,216	705,676	0	0	0	0	0
Domestic Supplier (Current-Rubles x 000)			342,285	4,772,321	14,391,645	12,404,485	0	0	0	0	0
Foreign Supplier (1993-US$ x 000)			1855.00	4298.00	5510.00	2636.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			1,877	4,453	5,890	2,915	0	0	0	0	0
Foreign Supplier (Current-Rubles x 000)			4,931,562	16,460,134	27,124,325	14,113,529	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		709,591	(263,898)	(3,134,060)	4,430,897	16,239,885	23,105,585	19,822,128	18,278,004	19,651,762	20,994,807
Less Retirements			0	0	0	0	0	(5,219,129)	(5,219,129)	(5,219,129)	(5,219,129)
Less Domestic Suppliers		0	(588,663)	(5,595,327)	(15,747,861)	(13,110,162)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(8,596,140)	(6,771,870)	(5,808,442)	(6,287,669)	(6,740,960)
Funds Available/(Required)		709,591	(852,761)	(8,729,387)	(11,316,964)	3,129,723	14,509,445	7,831,129	7,252,433	8,144,964	9,034,718
External Sources (Foreign Projects)		0	4,931,562	16,460,134	27,124,325	14,113,529	0	0	0	0	0
Accumulative Long-Term Debt			4,931,562	21,391,696	48,516,021	62,629,550	62,629,550	57,410,421	52,191,291	46,972,162	41,753,033
Retirements								5,219,129	5,219,129	5,219,129	5,219,129
Interest			246,578	1,316,163	3,495,386	5,557,279	6,262,955	6,001,999	5,480,086	4,958,173	4,436,260
Memo: Total Project		0	5,273,847	26,506,301	68,022,271	94,540,286	94,540,286	94,540,286	94,540,286	94,540,286	94,540,286
Memo: % Externally Financed		0.0%	93.5%	80.7%	71.3%	66.2%	66.2%				
Computation of ending retained earnings:											
Beginning retained earnings		56,138	597,516	(559,693)	(5,831,521)	(5,580,144)	5,089,873	13,686,013	20,457,882	26,264,324	32,551,993
adjusted net income		541,678	(1,157,509)	(5,271,828)	251,377	10,670,016	17,192,280	13,543,740	11,612,884	12,575,338	13,481,921
less: dividends		0	0	0	0	0	(8,596,140)	(6,771,870)	(5,808,442)	(6,287,669)	(6,740,960)
Ending retained earnings - to B/S		597,815	(559,693)	(5,831,521)	(5,580,144)	5,089,873	13,686,013	20,457,882	26,264,324	32,551,993	39,292,954

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Case–S–1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project investments											
1994 Investment											
VAT Payment			5,273,847								
VAT Recapture			1,054,769								
				(527,385)	(527,385)						
1995 Investment											
VAT Payment				21,232,454							
VAT Recapture				4,246,491							
					(2,123,245)	(2,123,245)					
1995 Investment											
VAT Payment					41,515,970						
VAT Recapture					8,303,194						
						(4,151,597)	(4,151,597)				
1996 Investment											
VAT Payment						26,518,014					
VAT Recapture						5,303,603					
							(2,651,801)	(2,651,801)			
Value Added Tax on Projects		0	1,054,769	4,246,491	8,303,194	5,303,603	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(527,385)	(2,650,630)	(6,274,842)	(6,803,396)	(2,651,801)	0	0	0
Net V.A.T. on Projects		0	1,054,769	3,719,106	5,652,564	(971,240)	(6,803,396)	(2,651,801)	0	0	0
On Sales											
(a) GAS & LPG Purchases		27,709,983	79,037,200	254,515,316	471,925,888	492,096,674	514,524,774	537,185,035	558,307,455	583,235,144	608,131,676
(b) Commodity = = Purchases / (1+VAT Rate)		23,091,652	65,864,334	212,096,096	393,271,573	410,080,562	428,770,645	447,654,196	465,256,213	486,029,287	506,776,397
(c) VAT Included = Line (b) – Line (b)		4,618,330	13,172,867	42,419,219	78,654,315	82,016,112	85,754,129	89,530,839	93,051,243	97,205,857	101,355,279
(d) GAS & LPG Sales		31,327,843	90,134,765	294,438,599	551,141,658	573,795,953	598,918,803	624,293,678	647,934,122	676,309,530	704,652,418
(e) Commodity = = Purchases / (1+VAT Rate)		26,106,536	75,112,304	245,365,499	459,264,715	478,163,294	499,099,003	520,244,731	539,945,102	563,591,275	587,210,347
(f) VAT Included = Line (d) – Line (e)		5,221,307	15,022,461	49,073,100	91,856,943	95,632,659	99,819,801	104,048,946	107,989,020	112,718,255	117,442,069
(g) Utility's VAT Liability = Line (f) – Line (c)		602,977	1,849,594	6,653,881	13,202,628	13,616,546	14,065,671	14,518,107	14,937,778	15,512,398	16,086,790
Test											
Margin on GAS & LPG Sales		3,617,861	11,097,565	39,923,283	79,215,770	81,699,279	84,394,029	87,108,643	89,626,667	93,074,386	96,520,740
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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Case–S–1

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			21,391,696	48,516,021	62,629,550	62,629,550	57,410,421	52,191,291	46,972,162	41,753,033
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			2,425	2,433	663	361	311	266	242	216
Additional ruble debt/expense to record – in rubles			9,071,317	11,204,983	3,209,679	1,798,287	1,590,891	1,397,071	1,303,031	1,198,245
cumulative			9,071,317	20,276,300	23,485,979	25,284,266	26,875,158	28,272,228	29,577,259	30,775,503
Computation of payment on additional L/T debt – 1/12th							2,239,596	2,472,442	2,682,277	2,864,186
cumulative							2,239,596	4,712,038	7,394,315	10,258,501

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Case – S – 1

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	26.6%	15.2%	22.0%	11.8%	7.8%	7.3%	7.1%	7.1%	7.2%	7.2%	7.3%
Short – Term Investments	0.0%	30.3%	17.4%	21.7%	21.1%	20.8%	25.0%	26.7%	28.1%	29.4%	30.8%
Cash & Investments	26.6%	45.5%	39.4%	33.5%	28.9%	28.1%	32.1%	33.8%	35.2%	36.7%	38.1%
Accounts receivable	35.4%	34.0%	27.1%	32.4%	32.3%	28.3%	27.2%	26.9%	26.7%	26.6%	26.5%
Materials & equipment	2.1%	1.2%	1.4%	0.8%	0.6%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Other assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Current Assets	64.2%	80.7%	68.0%	66.7%	61.8%	56.9%	59.8%	61.2%	62.5%	63.9%	65.2%
Fixed assets											
Adusted Cost of Fixed Assets	64.7%	37.1%	54.7%	47.9%	49.9%	55.9%	54.6%	55.1%	55.9%	56.7%	57.6%
Less: Accumulated Depreciation	28.9%	17.8%	22.7%	14.6%	11.7%	12.8%	14.3%	16.3%	18.4%	20.6%	22.8%
Net Revalued Assets	35.8%	19.3%	32.0%	33.3%	38.2%	43.1%	40.2%	38.8%	37.5%	36.1%	34.8%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	56.8%	57.1%	45.2%	53.2%	52.6%	46.1%	44.3%	44.0%	43.7%	43.6%	43.5%
Total Current Liabilities	56.8%	57.1%	45.2%	53.2%	52.6%	46.1%	44.3%	44.0%	43.7%	43.6%	43.5%
Long Term Debt	0.0%	0.0%	10.1%	16.0%	19.3%	21.0%	19.3%	16.8%	14.6%	12.5%	10.7%
Additional debt due to currency rate	0.0%	0.0%	0.0%	6.8%	8.1%	7.0%	7.8%	7.2%	6.6%	5.9%	5.2%
Other Funds	35.2%	20.1%	23.6%	13.5%	9.3%	6.7%	8.5%	8.6%	8.7%	8.8%	9.0%
Total Long Term Liabilities	35.2%	20.1%	33.6%	36.3%	36.7%	37.5%	35.6%	32.6%	29.9%	27.3%	24.9%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	18.3%	22.3%	14.8%	13.0%	14.6%	15.9%	17.5%	19.0%	20.4%	21.6%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	6.7%	4.4%	−1.1%	−4.4%	−2.2%	1.7%	4.2%	6.0%	7.3%	8.7%	10.0%
Net Equity	8.0%	22.8%	21.2%	10.5%	10.8%	16.3%	20.1%	23.5%	26.3%	29.1%	31.6%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	540,998	10,972,768	33,322,931	89,400,748	155,365,198	170,072,049	194,267,801	209,504,507	223,406,346	239,079,584	255,462,808
Current liabilities	478,875	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,787	150,461,767	156,378,009	163,360,080	170,333,425
Working capital	62,123	3,211,396	11,185,165	18,112,790	23,202,059	32,239,216	50,153,014	59,042,739	67,028,337	75,719,504	85,129,381
Change in working capital		3,149,273	7,973,769	6,927,626	5,089,268	9,037,158	17,913,798	8,889,725	7,985,598	8,691,167	9,409,877
Current ratio	1.13	1.41	1.51	1.25	1.18	1.23	1.35	1.39	1.43	1.48	1.50
Capitalization Table:											
Debt	296,377	2,738,060	16,494,151	48,611,298	92,141,856	112,162,820	115,567,174	111,406,641	106,920,676	102,247,751	97,403,781
Equity	67,667	3,094,665	10,387,107	14,055,293	27,075,670	48,839,107	65,374,712	80,221,407	94,194,738	108,756,916	123,842,046
Percent debt	81.4%	46.9%	61.4%	77.6%	77.3%	69.7%	63.9%	58.1%	53.2%	48.5%	44.0%
Percent equity	18.6%	53.1%	38.6%	22.4%	22.7%	30.3%	36.1%	41.9%	46.8%	51.5%	56.0%
Times Interest Earned:											
Net income	59,245	541,678	(1,157,509)	(5,271,828)	251,377	10,670,016	17,192,280	13,543,740	11,612,884	12,575,338	13,481,921
Add back: Interest expense	0	0	246,578	1,316,163	3,495,386	5,557,279	6,262,955	6,001,999	5,480,086	4,958,173	4,436,260
depreciation	0	167,912	893,612	2,137,768	4,179,519	5,569,868	5,913,305	6,278,389	6,665,120	7,076,424	7,512,887
taxes	71,913	1,025,538	3,468,004	22,603,139	40,174,155	35,905,093	36,308,853	36,858,617	36,990,714	37,499,950	37,999,428
total	131,158	1,735,129	3,450,685	20,785,241	48,100,437	57,702,256	65,677,393	62,682,744	60,748,803	62,109,885	63,430,493
Interest	0	0	246,578	1,316,163	3,495,386	5,557,279	6,262,955	6,001,999	5,480,086	4,958,173	4,436,260
Time interest earned			14.0	15.8	13.8	10.4	10.5	10.4	11.1	12.5	14.3
Operating revenue	2,025,403	31,327,843	90,134,765	294,438,599	551,141,658	573,795,953	598,918,803	624,293,678	647,934,122	676,309,530	704,652,416
Operating expenses (B4 depr, tax)	1,813,347	28,666,819	83,080,792	260,852,014	480,091,533	501,205,760	524,195,524	547,452,850	569,207,739	594,808,084	620,418,417
Operating margin	212,056	2,661,024	7,053,973	33,576,585	71,050,125	72,590,193	74,723,279	76,840,828	78,726,383	81,501,445	84,233,999
Percent	10.5%	8.5%	7.8%	11.4%	12.9%	12.7%	12.5%	12.3%	12.2%	12.1%	12.0%
Net income to total revenue	2.9%	1.7%	−1.3%	−1.8%	0.0%	1.9%	2.9%	2.2%	1.8%	1.9%	1.9%
Return on total assets	7.0%	4.0%	−2.4%	−3.9%	0.1%	3.6%	5.3%	4.0%	3.2%	3.4%	3.4%
Return on beginning equity		800.5%	−37.4%	−50.8%	1.8%	39.4%	35.2%	20.7%	14.5%	13.4%	12.4%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum. Deprec. / Assets	44.7%	48.0%	41.5%	30.5%	23.4%	22.9%	26.3%	29.6%	32.9%	36.3%	39.6%
Receivables / Sales	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%
increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		5,961,380	13,140,519	25,540,503	27,801,164	11,181,553	20,392,413	11,390,057	10,304,920	11,370,867	12,078,522
Accounts receivable		4,322,632	8,675,068	30,136,453	37,868,271	3,341,912	3,706,068	3,743,246	3,487,386	4,185,878	4,181,080
Materials & equipment		144,573	523,051	390,262	308,221	159,866	95,174	101,173	107,172	113,982	120,954
Other assets		3,186	11,525	8,599	6,792	3,523	2,097	2,229	2,362	2,512	2,665
Net fixed assets		2,317,407	13,076,765	28,857,707	51,461,666	32,747,243	2,026,161	1,796,436	1,501,769	1,198,085	831,283
		12,749,178	35,426,928	84,935,524	117,446,114	47,434,097	26,221,913	17,033,141	15,403,609	16,871,324	17,214,504
Credits:											
Accounts payable		7,282,497	14,376,394	49,150,192	60,895,179	5,649,696	6,281,954	6,346,960	5,916,242	6,982,071	6,973,344
Long term debt		0	4,931,562	16,460,134	27,124,325	14,113,529	0	(5,219,129)	(5,219,129)	(5,219,129)	(5,219,129)
Currency fluctuation on L/T debt			0	9,071,317	11,204,983	3,209,679	1,798,287	(648,705)	(1,075,371)	(1,377,246)	(1,665,942)
Other funds		2,439,683	8,826,529	6,585,696	5,201 250	2,697,755	1,606,067	1,707,301	1,608,536	1,923,450	2,041,101
Equity/retained earnings		3,026,998	7,292,443	3,668,185	13,020,377	21,763,437	16,535,605	14,846,695	13,973,331	14,562,178	15,085,130
		12,749,178	35,426,928	84,935,524	117,446,114	47,434,098	26,221,913	17,033,142	15,403,609	16,871,324	17,214,504
check: net change debits and credits		0	0	0	0	(1)	0	1	0	0	0
Does balance sheet balance?		1	1	1	1	1	2	2	2	3	3
check: analysis of change in fixed assets		(0)	(0)	0	(0)	0	0	(0)	(0)	(0)	0
check: analysis of change in equity/RE		0	0	(0)	0	0	(0)	0	(0)	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	(0)	0	(0)	(0)	(0)	0	0
Analysis of change in net fixed assets:											
Revaluation write up of assets		4,491,711	16,250,562	15,269,219	18,380,357	14,486,781	10,303,087	10,952,514	11,601,942	12,339,131	13,093,871
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,329,206)	(5,611,358)	(3,393,360)	(2,363,621)	(2,877,690)	(3,435,053)	(4,064,621)	(4,749,702)
Current depreciation		(167,912)	(893,612)	(2,137,768)	(4,179,519)	(5,569,868)	(5,913,305)	(6,278,389)	(6,665,120)	(7,076,424)	(7,512,887)
New capital expenditures, net		0	5,520,425	22,055,461	42,872,186	27,223,691	0	0	0	0	0
		2,317,407	13,076,765	28,857,707	51,461,666	32,747,243	2,026,161	1,796,436	1,501,769	1,198,085	831,283
Analysis of change in net equity/RE											
Net income		541,678	(1,157,509)	(5,271,828)	251,377	10,670,016	17,192,280	13,543,740	11,612,884	12,575,338	13,481,921
Revaluation surplus (direct cr. to equity)		4,491,711	16,250,562	15,269,219	18,380,357	14,486,781	10,303,087	10,952,514	11,601,942	12,339,131	13,093,871
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,329,206)	(5,611,358)	(3,393,360)	(2,363,521)	(2,877,690)	(3,435,053)	(4,064,621)	(4,749,702)
Dividends declared		0	0	0	0	0	(8,596,140)	(8,771,870)	(5,806,442)	(6,287,669)	(6,740,960)
		3,026,998	7,292,443	3,668,185	13,020,377	21,763,437	16,535,605	14,846,695	13,973,331	14,562,178	15,085,130
Analysis of change in long term debt:											
New debt issued		0	4,931,562	16,460,134	27,124,325	14,113,529	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(5,219,129)	(5,219,129)	(5,219,129)	(5,219,129)
		0	4,931,562	16,460,134	27,124,325	14,113,529	0	(5,219,129)	(5,219,129)	(5,219,129)	(5,219,129)

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Case–S–2

INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		426,852	2,554,048	15,029,820	36,456,803	36,520,729	36,483,891	36,393,987	36,310,544	37,008,397	37,711,700
Natural Gas, Other		30,891,114	87,872,243	281,470,237	520,477,973	545,361,609	570,918,857	596,744,883	620,823,400	648,015,369	676,968,399
Natural Gas, Total		31,317,965	90,426,291	296,500,057	556,934,776	581,882,338	607,382,749	633,138,850	657,133,943	685,923,766	714,680,099
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,84
Total Sales Revenues	2,025,403	31,327,843	90,468,035	296,565,578	557,019,075	581,976,377	607,482,586	633,244,851	657,246,473	686,043,261	714,806,942
Other Revenues	2,822	23,230	98,169	154,083	198,243	221,148	234,784	249,279	264,634	280,965	298,294
TOTAL OPERATING INCOME	2,028,225	31,351,073	90,566,204	296,719,662	557,217,319	582,197,525	607,717,370	633,494,130	657,511,108	686,324,225	715,105,237
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		156,007	919,457	5,410,735	13,124,449	13,147,462	13,127,001	13,101,828	13,071,796	13,323,023	13,576,212
Natural Gas, Other		27,528,460	78,009,913	249,935,335	458,583,888	478,706,302	501,139,886	523,809,397	544,944,984	569,603,508	594,227,817
Natural Gas, Total		27,684,467	78,929,371	254,346,070	471,708,137	491,853,764	514,266,887	536,911,225	558,016,780	582,926,531	607,804,029
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,709,700	27,709,983	79,037,200	254,515,316	471,925,888	492,096,674	514,524,774	537,185,035	558,307,455	583,235,144	608,131,676
Payroll (Wages & Bonus)	41,268	380,973	1,602,993	2,526,996	3,251,226	3,626,866	3,850,497	4,038,224	4,340,048	4,607,872	4,892,078
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	62,379	575,863	2,433,599	3,819,702	4,914,419	5,482,220	5,820,252	6,179,591	6,560,237	6,965,069	7,394,663
TOTAL OPERATING EXPENSES	1,813,347	28,666,819	83,080,792	260,862,014	480,091,533	501,205,760	524,195,524	547,452,850	569,207,739	594,808,084	620,418,417
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	214,878	2,684,254	7,485,412	35,857,648	77,125,786	80,991,765	83,521,846	86,041,280	88,303,368	91,516,141	94,686,819

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Case–S–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
DEDUCTIONS											
Depreciation		167,912	951,922	2,338,376	4,117,479	5,064,797	5,377,091	5,709,069	6,060,732	6,434,739	6,831,624
Value Added Tax (on Sales)	83,720	602,977	1,905,139	7,008,377	14,182,196	14,979,951	15,492,969	16,009,969	16,489,836	17,134,606	17,779,211
Net Value Added Tax (on Projects)		0	1,394,263	4,166,269	3,281,075	(2,882,266)	(4,562,147)	(1,377,193)	0	0	0
Gas Rehabilitation Fund		361,786	1,143,083	4,205,026	8,509,319	8,987,970	9,295,781	9,605,982	9,893,902	10,280,812	10,667,527
TOTAL DEDUCTIONS	83,720	1,132,675	5,394,408	17,718,049	30,090,070	26,150,451	25,583,694	29,947,826	32,444,470	33,850,237	35,278,361
NET INCOME BEFORE INTEREST and TAXES	131,158	1,567,216	2,157,089	18,243,324	47,169,166	54,990,165	58,096,203	56,261,262	56,037,043	57,855,042	59,609,262
INTEREST and TAXES											
Interest Expenses		0	298,419	1,607,885	3,837,310	5,431,550	5,807,411	5,565,436	5,081,485	4,597,534	4,113,583
Currency fluctuation loss on debt			0	11,105,780	11,676,331	2,976,219	1,667,486	1,475,176	1,295,453	1,210,108	1,111,089
Taxes:											
Corporate Income Tax	64,943	858,961	2,395,332	11,474,447	24,680,251	25,017,365	26,726,991	27,533,210	28,257,078	29,285,165	30,299,782
Excess Payroll Tax	6,970	74,290	313,949	492,764	633,989	707,239	750,847	797,204	846,309	898,535	953,955
Property Tax		77,816	574,402	780,745	1,792,511	2,901,299	3,253,570	3,533,362	3,722,839	3,903,419	4,099,827
Road Tax		14,471	45,723	168,201	340,373	359,519	371,631	384,239	395,756	411,232	426,701
TOTAL INTEREST and TAXES	71,913	1,025,538	3,627,825	25,629,823	42,960,766	33,293,191	38,578,136	39,288,627	39,598,920	40,305,993	41,004,037
NET INCOME	59,245	541,678	(1,470,736)	(7,386,498)	4,208,402	16,696,994	19,518,067	16,972,635	16,438,124	17,549,049	18,604,325
Memo: Weighted Ave Cost of Gas		8,872	25,982	64,304	154,861	160,369	165,777	171,515	177,588	183,594	189,789
Memo: Weighted Ave Sales Price of Gas		10,189	30,082	98,968	183,424	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,182	3,825	14,070	28,078	29,354	30,017	30,740	31,544	32,439	33,373
Memo: Cash Flow From Natural Gas		3,633,499	11,496,920	42,153,988	85,226,640	90,028,574	93,115,862	96,227,625	99,117,163	102,997,255	106,876,070
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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Case–S–2

BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	223,965	2,037,575	10,805,147	15,781,800	19,712,260	21,750,889	22,964,555	24,254,722	25,621,389	27,074,894	28,617,305
Short–Term Investments	300	4,118,070	7,504,453	28,412,297	62,943,615	83,514,838	103,132,912	114,415,866	125,235,190	137,083,637	149,606,688
Cash & Short Term Investments	224,265	6,185,645	18,309,599	44,194,097	82,655,875	105,265,727	126,097,467	138,670,590	150,856,579	164,158,532	178,223,993
Accounts receivable – Gross *(See Note C)*	298,783	4,621,415	13,345,646	43,748,702	82,170,230	85,851,876	89,614,496	93,414,889	96,955,556	101,203,594	105,446,749
Materials & equipment	17,563	162,136	685,187	1,075,449	1,383,670	1,543,536	1,638,710	1,739,883	1,847,055	1,961,037	2,081,990
Other assets	387	3,573	15,098	23,697	30,489	34,012	36,109	38,338	40,700	43,211	45,877
Total Current Assets	540,998	10,972,768	32,355,531	89,041,946	166,240,264	192,695,151	217,386,782	233,863,700	249,699,889	267,366,374	285,798,609
Fixed assets											
Adusted Cost of Fixed Assets	545,661	5,037,372	26,557,668	70,151,288	123,524,370	151,943,905	161,312,715	171,272,064	181,821,950	193,042,178	204,948,707
Less: Accumulated Depreciation	243,740	2,418,044	11,170,576	19,871,370	29,683,931	38,178,345	45,909,499	54,452,992	63,867,878	74,243,902	85,654,770
Net Revalued Assets	301,921	2,619,328	17,387,092	50,279,918	93,840,439	113,765,560	115,403,216	116,819,071	117,954,072	118,798,275	119,293,937
TOTAL ASSETS	842,919	13,592,096	49,742,622	139,321,864	260,080,703	306,460,712	332,789,998	350,682,771	367,653,961	386,164,649	405,092,546
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	478,575	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,767	150,481,767	156,378,009	163,360,080	170,333,425
Total Current Liabilities	478,875	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,767	150,481,767	156,378,009	163,360,080	170,333,425
Long Term Debt		0	5,968,386	26,189,305	50,556,692	58,074,113	58,074,113	53,234,604	48,395,094	43,555,585	38,716,076
Additional debt due to currency rate			0	11,105,780	22,782,112	25,758,331	27,425,818	26,492,577	25,163,705	23,554,915	21,678,429
Other Funds	298,377	2,736,060	11,562,589	18,148,286	23,349,536	28,047,291	27,653,358	28,360,659	31,169,195	33,092,645	35,133,746
Total Long Term Liabilities	298,377	2,736,060	17,530,976	55,443,371	96,688,540	109,879,735	113,153,289	109,087,841	104,727,995	100,203,146	95,528,250
Other Liabilities & Equity											
Net Revaluation Surplus		2,435,319	10,935,272	20,838,426	35,248,516	46,030,638	53,105,384	60,230,306	67,426,041	74,704,983	82,032,268
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529
Retained Earnings	56,138	597,816	(872,920)	(8,259,418)	(4,051,016)	12,645,978	22,405,012	30,891,329	39,110,391	47,884,916	57,187,078
Net Equity	67,667	3,094,665	10,073,881	12,590,537	31,209,029	58,748,145	75,521,925	91,133,167	106,547,961	122,601,428	139,230,876
TOTAL LIABILITIES & EQUITY	842,919	13,592,097	49,742,623	139,321,866	260,080,706	306,460,714	332,790,001	350,682,775	367,653,965	386,164,654	405,092,551

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Case-S-2

Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		541,678	(1,470,736)	(7,386,498)	4,208,402	16,698,994	19,518,067	16,972,835	16,438,124	17,549,049	18,604,325
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		167,912	951,922	2,338,376	4,117,479	5,034,797	5,377,091	5,709,069	6,060,732	6,434,739	6,831,624
Currency fluctuation loss on L/T debt			0	11,105,780	11,678,331	2,976,219	1,667,486	1,475,176	1,295,453	1,210,108	1,111,089
Changes in assets and liabilities:											
Accounts receivable		(4,322,632)	(8,724,231)	(30,403,057)	(38,421,528)	(3,681,646)	(3,762,620)	(3,800,393)	(3,540,667)	(4,245,039)	(4,243,155)
Materials and supplies		(144,573)	(523,051)	(390,262)	(308,221)	(159,866)	(95,174)	(101,173)	(107,172)	(113,982)	(120,954)
Other assets		(3,186)	(11,525)	(8,599)	(6,792)	(3,523)	(2,097)	(2,229)	(2,362)	(2,512)	(2,665)
Accounts payable		7,282,497	14,376,394	49,150,192	60,895,176	5,649,696	6,251,954	6,346,980	5,916,242	6,962,071	6,973,344
Other funds		2,439,683	6,826,329	6,595,696	5,201,250	2,697,755	1,606,067	1,707,301	1,808,536	1,923,450	2,041,101
Net cash provided by operations		5,961,380	13,435,302	30,991,625	47,362,100	29,240,427	30,590,774	28,307,366	27,868,885	29,734,584	31,194,709
Cash flows from investing activities:											
Note: Does not include internally-funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,301,347)	(5,107,130)	(8,900,323)	(6,630,574)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(5,968,386)	(20,220,918)	(24,367,588)	(7,517,221)	0	0	0	0	0
Net cash used in investing activities		0	(7,269,734)	(25,328,048)	(33,267,911)	(14,147,795)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	5,968,386	20,220,918	24,367,588	7,517,221	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(4,839,509)	(4,839,509)	(4,839,509)	(4,839,509)
Loss on Currency Fluctuation		0	0	0	0	0	0	(2,406,416)	(2,624,325)	(2,818,897)	(2,967,576)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(9,759,033)	(8,486,318)	(8,219,062)	(8,774,325)	(9,302,163)
Net cash provided (used in) financing activities		0	5,968,386	20,220,918	24,367,588	7,517,221	(9,759,033)	(15,734,243)	(15,682,896)	(16,432,931)	(17,129,248)
Net increase (decrease) in cash and cash equivalents		5,961,380	12,123,954	25,884,496	38,461,778	22,609,852	20,831,740	12,573,123	12,185,989	13,301,953	14,065,461
Cash and cash equivalents – beginning		224,265	6,185,645	18,309,599	44,194,097	82,655,875	105,265,727	126,097,467	138,670,590	150,856,579	164,158,532
Cash and cash equivalents – ending		6,185,645	18,309,599	44,194,097	82,655,875	105,265,727	126,097,467	138,670,590	150,856,579	164,158,532	178,223,993

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Case-3-2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	544,513	545,661	5,037,372	28,557,668	70,151,288	123,524,370	151,943,905	161,312,715	171,272,064	181,821,950	193,042,178
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	544,513	5,037,372	21,287,934	44,823,240	90,256,459	137,796,110	161,312,715	171,272,064	181,821,950	193,042,178	204,948,707
New Investments (Current Year)	0	0	7,269,734	25,328,048	33,267,911	14,147,795	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	1,148										
Ending Value of Assets (Gross)	545,661	5,037,372	28,557,668	70,151,288	123,524,370	151,943,905	161,312,715	171,272,064	181,821,950	193,042,178	204,948,707
Accumulated Depreciation		243,740	2,418,044	11,170,576	19,871,370	29,683,931	38,178,345	45,909,499	54,452,992	63,867,878	74,243,902
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	243,740	2,250,132	10,218,654	17,532,994	25,568,452	33,113,548	40,532,409	48,743,924	57,807,147	67,809,163	78,823,146
Current Depreciation		167,912	951,922	2,338,376	4,117,479	5,064,797	5,377,091	5,709,069	6,060,732	6,434,739	6,831,624
Net Value of Assets	301,921	2,619,328	17,387,092	50,279,918	93,940,439	113,765,560	115,403,216	116,819,071	117,954,072	118,798,275	119,293,937
Accum. Revaluation Surplus		4,491,711	20,742,273	37,007,845	57,113,016	71,384,756	80,753,566	90,7[illegible]2,915	101,262,801	112,483,029	124,389,557
Accum. Reevaluated Depreciation		2,006,392	9,807,002	16,169,419	21,864,501	25,294,118	27,648,182	30,482,606	33,838,760	37,778,045	42,357,289
Net Reevaluation Surplus		2,485,319	10,935,272	20,838,426	35,248,516	46,090,638	53,105,384	60,230,308	67,426,041	74,704,983	82,032,268

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Case–S–2

Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	222,285	216,676	210,817	204,805	198,692	192,495	186,236	179,941	173,625	171,309	168,988
Other	2,982,874	2,903,346	2,826,989	2,812,209	2,847,317	2,874,515	2,915,916	2,950,458	2,968,572	3,003,779	3,033,529
Total	3,205,159	3,120,522	3,037,806	3,017,014	3,046,009	3,067,010	3,102,152	3,130,399	3,142,197	3,175,088	3,202,517
Losses (%)											
Residential	1.5%	1.5%									
Other	1.5%	1.5%	1.1%	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	218,951	213,426	210,817	204,805	198,692	192,495	186,236	179,941	173,625	171,309	168,988
Other	2,938,131	2,860,288	2,795,185	2,791,117	2,836,640	2,874,515	2,915,916	2,950,458	2,968,572	3,003,779	3,033,529
Total	3,157,082	3,073,714	3,006,002	2,995,922	3,035,332	3,067,010	3,102,152	3,130,399	3,142,197	3,175,088	3,202,517
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential											
(1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	88,300	70,486	72,812	75,288	77,772	80,338
Other											
(1993 Basis = 7900 + V.A.T.)		9,450	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,398	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,365	83,198	88,334	93,775	99,562	105,703

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Case–S–2

Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,827	3,741	4,605	4,841	4,980	5,116	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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Case–S–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		20.7%	−8.5%	−14.7%	4.5%	14.7%	16.9%	14.5%	13.9%	14.8%	15.6%
Average over Period 1998–2002							15.1%				
External Financing		0.0%	85.6%	83.7%	79.8%	75.3%	75.3%				

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Case-S-2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993-US$ x 000)			265.00	796.00	1313.00	1096.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			268	825	1,404	1,214	0	0	0	0	0
Duties on Foreign Suppliers			298,419	1,011,046	1,218,379	375,861	0	0	0	0	0
Domestic Supplier (Current-Rubles x 000)			1,002,928	4,096,084	7,681,944	6,254,713	0	0	0	0	0
Foreign Supplier (1993-US$ x 000)			2245.00	5280.00	4950.00	1404.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			2,272	5,470	5,292	1,553	0	0	0	0	0
Foreign Supplier (Current-Rubles x 000)			5,968,386	20,220,918	24,367,588	7,517,221	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		709,591	(518,814)	(5,048,122)	8,325,861	21,761,791	24,895,157	22,681,704	22,498,855	23,963,789	25,435,949
Less Retirements			0	0	0	0	0	(4,839,509)	(4,839,509)	(4,839,509)	(4,839,509)
Less Domestic Suppliers		0	(1,301,347)	(5,107,130)	(8,900,323)	(6,630,574)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(9,759,033)	(8,486,318)	(8,219,062)	(8,774,525)	(9,302,163)
Funds Available/(Required)		709,591	(1,820,161)	(10,155,252)	(574,442)	15,131,217	15,136,124	9,355,877	9,440,284	10,389,754	11,294,277
External Sources (Foreign Projects)		0	5,968,386	20,220,918	24,367,588	7,517,221	0	0	0	0	0
Accumulative Long-Term Debt			5,968,386	26,189,305	50,556,892	58,074,113	58,074,113	53,234,604	48,395,094	43,555,585	38,716,076
Retirements								4,839,509	4,839,509	4,839,509	4,839,509
Interest			298,419	1,607,885	3,837,310	5,431,550	5,807,411	5,565,436	5,081,485	4,597,534	4,113,583
Memo: Total Project		0	6,971,315	31,268,317	63,337,848	77,109,782	77,109,782	77,109,782	77,109,782	77,109,782	77,109,782
Memo: % Externally Financed		0.0%	85.6%	83.7%	79.8%	75.3%	75.3%				
Computation of ending retained earnings:											
Beginning retained earnings		56,138	597,816	(872,920)	(8,259,418)	(4,051,016)	12,645,978	22,405,012	30,891,329	39,110,391	47,884,916
adjusted net income		541,678	(1,470,736)	(7,386,498)	4,208,402	16,696,994	19,518,067	16,972,635	16,432,124	17,549,049	18,604,325
less: dividends		0	0	0	0	0	(9,759,033)	(8,486,318)	(8,219,062)	(8,774,525)	(9,302,163)
Ending retained earnings - to B/S		597,816	(872,920)	(8,259,418)	(4,051,016)	12,645,978	22,405,012	30,891,329	39,110,391	47,884,916	57,187,078

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Case-S-2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments:											
1994 Investment			6,971,315								
VAT Payment			1,394,263								
VAT Recapture				(697,131)	(697,131)						
1995 Investment				24,317,002							
VAT Payment				4,863,400							
VAT Recapture					(2,431,700)	(2,431,700)					
1995 Investment					32,049,531						
VAT Payment					6,409,906						
VAT Recapture						(3,204,953)	(3,204,953)				
1996 Investment						13,771,934					
VAT Payment						2,754,387					
VAT Recapture							(1,377,193)	(1,377,193)			
Value Added Tax on Projects		0	1,394,263	4,863,400	6,409,906	2,754,387	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(697,131)	(3,128,832)	(5,636,653)	(4,582,147)	(1,377,193)	0	0	0
Net V.A.T. on Projects		0	1,394,263	4,166,269	3,281,075	(2,882,266)	(4,582,147)	(1,377,193)	0	0	0
On Sales											
(a) GAS & LPG Purchases		27,709,963	79,037,200	254,515,316	471,925,888	492,096,674	514,524,774	537,185,035	558,307,455	583,235,144	608,131,676
(b) Commodity = = Purchases / (1+VAT Rate)		23,091,652	65,864,334	212,096,096	393,271,573	410,080,562	428,770,645	447,654,196	465,256,213	486,029,287	506,776,397
(c) VAT Included = Line (b) – Line (b)		4,618,330	13,172,867	42,419,219	78,654,315	82,016,112	85,754,129	89,530,839	93,051,243	97,205,857	101,355,279
(d) GAS & LPG Sales		31,327,843	90,468,035	296,565,578	557,019,075	581,976,377	607,482,586	633,244,851	657,246,473	686,043,261	714,806,942
(e) Commodity = = Purchases / (1+VAT Rate)		26,106,536	75,390,029	247,137,982	464,182,563	484,980,314	506,235,488	527,704,042	547,705,395	571,702,717	595,672,452
(f) VAT Included = Line (d) – Line (e)		5,221,307	15,078,006	49,427,596	92,836,513	96,996,063	101,247,098	105,540,809	109,541,079	114,340,543	119,134,490
(g) Utility's VAT Liability = Line (f) – Line (c)		602,977	1,905,139	7,008,377	14,182,198	14,979,951	15,492,969	16,009,969	16,489,836	17,134,686	17,779,211
Test											
Margin on GAS & LPG Sales		3,617,861	11,430,835	42,050,262	85,093,187	89,870,703	92,957,811	96,059,816	98,939,018	102,808,117	106,675,266
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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Case-S-2

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			26,189,305	50,556,892	58,074,113	58,074,113	53,234,604	48,395,094	43,555,585	38,716,076
Beginning ruble/US$ exchange rate			$0.000380862	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			2,969	2,536	615	335	288	247	224	200
Additional ruble debt/expense to record – in rubles			11,105,780	11,676,331	2,976,219	1,667,486	1,475,176	1,295,453	1,210,108	1,111,089
cumulative			11,105,780	22,782,112	25,758,331	27,425,818	28,900,993	30,196,446	31,406,554	32,517,643
Computation of payment on additional L/T debt – 1/12th							2,408,416	2,624,325	2,818,897	2,087,576
cumulative							2,408,416	5,032,741	7,851,638	10,839,214

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Case–S–2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	26.6%	15.2%	21.7%	11.3%	7.6%	7.1%	6.9%	6.9%	7.0%	7.0%	7.1%
Short–Term Investments	0.0%	30.3%	15.1%	20.4%	24.2%	27.3%	31.0%	32.6%	34.1%	35.5%	36.9%
Cash & Investments	26.6%	45.5%	36.8%	31.7%	31.8%	34.3%	37.9%	39.5%	41.0%	42.5%	44.0%
Accounts receivable	35.4%	34.0%	26.8%	31.4%	31.6%	28.0%	26.9%	26.6%	26.4%	26.2%	26.0%
Materials & equipment	2.1%	1.2%	1.4%	0.8%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Other assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Current Assets	64.2%	80.7%	65.0%	63.9%	63.9%	62.9%	65.3%	66.7%	67.9%	69.2%	70.6%
Fixed assets											
Adusted Cost of Fixed Assets	64.7%	37.1%	57.4%	50.4%	47.5%	49.6%	48.5%	48.8%	49.5%	50.0%	50.6%
Less: Accumulated Depreciation	28.9%	17.8%	22.5%	14.3%	11.4%	12.5%	13.8%	15.5%	17.4%	19.2%	21.1%
Net Revalued Assets	35.8%	19.3%	35.0%	36.1%	36.1%	37.1%	34.7%	33.3%	32.1%	30.8%	29.4%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	56.8%	57.1%	44.5%	51.2%	50.8%	45.0%	43.3%	42.9%	42.5%	42.3%	42.0%
Total Current Liabilities	56.8%	57.1%	44.5%	51.2%	50.8%	45.0%	43.3%	42.9%	42.5%	42.3%	42.0%
Long Term Debt	0.0%	0.0%	12.0%	18.8%	19.4%	18.9%	17.5%	15.2%	13.2%	11.3%	9.6%
Additional debt due to currency rate	0.0%	0.0%	0.0%	8.0%	8.8%	8.4%	8.2%	7.6%	6.8%	6.1%	5.4%
Other Funds	35.2%	20.1%	23.2%	13.0%	9.0%	8.5%	8.3%	8.4%	8.5%	8.6%	8.7%
Total Long Term Liabilities	35.2%	20.1%	35.2%	39.8%	37.2%	35.9%	34.0%	31.1%	28.5%	25.9%	23.6%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	16.3%	22.0%	15.0%	13.6%	15.0%	16.0%	17.2%	18.3%	19.3%	20.3%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	6.7%	4.4%	−1.8%	−5.9%	−1.6%	4.1%	6.7%	8.8%	10.6%	12.4%	14.1%
Net Equity	8.0%	22.8%	20.3%	9.0%	12.0%	19.2%	22.7%	26.0%	29.0%	31.7%	34.4%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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Case–S–2

RATIOS	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Current assets	540,998	10,972,768	32,355,531	89,041,946	166,240,264	192,695,151	217,336,782	233,863,700	249,699,889	267,366,374	285,798,609
Current liabilities	478,875	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,787	150,461,767	156,378,009	163,360,080	170,333,425
Working capital	62,123	3,211,396	10,217,764	17,753,988	34,057,126	54,862,318	73,271,995	83,401,932	93,321,880	104,006,293	115,465,184
Change in working capital		3,149,273	7,006,368	7,536,224	16,303,138	20,805,192	18,409,677	10,129,937	9,919,947	10,684,414	11,458,891
Current ratio	1.13	1.41	1.46	1.25	1.26	1.40	1.51	1.55	1.60	1.64	1.68
Capitalization Table:											
Debt	296,377	2,736,060	17,530,973	55,443,371	96,686,540	109,879,735	113,153,289	109,087,841	104,727,995	100,203,146	95,528,250
Equity	67,667	3,094,665	10,073,881	12,590,537	31,209,029	58,748,145	75,521,925	91,133,167	106,547,961	122,601,428	139,230,876
Percent debt	81.4%	46.9%	63.5%	81.5%	75.6%	65.2%	60.0%	54.5%	49.6%	45.0%	40.7%
Percent equity	18.6%	53.1%	36.5%	18.5%	24.4%	34.8%	40.0%	45.5%	50.4%	55.0%	59.3%
Times Interest Earned:											
Net income	59,245	541,678	(1,470,736)	(7,386,498)	4,208,402	16,698,994	19,518,067	16,972,635	16,438,124	17,549,049	18,604,325
Add back: interest expense	0	0	298,419	1,607,885	3,837,310	5,431,550	5,807,411	5,565,436	5,081,485	4,597,534	4,113,583
depreciation	0	167,912	951,922	2,338,376	4,117,479	5,064,797	5,377,091	5,709,069	6,060,732	6,434,739	6,831,624
taxes	71,913	1,025,538	3,627,825	25,629,823	42,960,766	38,293,191	38,578,136	39,288,627	39,598,920	40,305,993	41,004,937
total	131,158	1,735,129	3,407,431	22,189,585	55,123,957	65,486,532	69,280,705	67,535,767	67,179,260	68,887,315	70,554,469
Interest	0	0	298,419	1,607,885	3,837,310	5,431,550	5,807,411	5,565,436	5,081,485	4,597,534	4,113,583
Time interest earned			11.4	13.8	14.4	12.1	11.9	12.1	13.2	15.0	17.2
Operating revenue	2,025,403	31,327,843	90,468,035	296,565,578	557,019,075	581,976,377	607,482,586	633,244,851	657,246,473	688,043,261	714,806,942
Operating expenses (B4 depr, tax)	1,813,347	28,666,819	83,080,792	260,862,014	480,091,533	501,205,760	524,195,524	547,452,850	569,207,739	594,808,084	620,418,417
Operating margin	212,056	2,661,024	7,387,243	35,703,564	76,927,542	80,770,617	83,287,062	85,792,001	88,038,734	91,235,176	94,388,525
Percent	10.5%	8.5%	8.2%	12.0%	13.8%	13.9%	13.7%	13.5%	13.4%	13.3%	13.2%
Net income to total revenue	2.9%	1.7%	−1.6%	−2.5%	0.8%	2.9%	3.2%	2.7%	2.5%	2.6%	2.6%
Return on total assets	7.0%	4.0%	−3.0%	−5.3%	1.6%	5.4%	5.9%	4.8%	4.5%	4.5%	4.6%
Return on beginning equity		800.5%	−47.5%	−73.3%	33.4%	53.5%	33.2%	22.5%	18.0%	16.5%	15.2%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum. Deprec. / Assets	44.7%	48.0%	39.1%	28.3%	24.0%	25.1%	28.5%	31.8%	35.1%	38.5%	41.8%
Receivables / Sales	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.6%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		5,961,380	12,123,955	25,884,498	38,461,777	22,609,852	20,831,740	12,573,123	12,185,989	13,301,953	14,065,461
Accounts receivable		4,322,632	8,724,231	30,403,057	38,421,528	3,681,646	3,762,620	3,800,393	3,540,667	4,248,059	4,243,155
Materials & equipment		144,573	523,051	390,262	308,221	159,866	95,174	101,173	107,172	113,982	120,954
Other assets		3,186	11,525	8,599	6,792	3,523	2,097	2,229	2,362	2,512	2,665
Net fixed assets		2,317,407	14,767,764	32,892,826	43,560,521	19,925,121	1,537,656	1,415,855	1,135,001	844,203	495,662
		12,749,178	36,150,526	89,579,242	120,758,839	46,380,008	26,329,287	17,892,773	16,971,191	18,510,689	18,927,897
Credits:											
Accounts payable		7,282,497	14,376,394	49,150,192	60,895,179	5,649,696	6,281,954	6,346,980	5,916,242	6,982,071	6,973,344
Long term debt		0	5,968,386	20,220,918	24,367,588	7,517,221	0	(4,839,509)	(4,839,509)	(4,839,509)	(4,839,509)
Currency fluctuation on L/T debt			0	11,105,780	11,673,331	2,976,219	1,667,486	(933,240)	(1,328,872)	(1,608,790)	(1,876,487)
Other funds		2,439,683	8,826,529	6,585,666	5,201,250	2,697,755	1,606,067	1,707,301	1,808,536	1,923,450	2,041,101
Equity/retained earnings		3,026,998	6,979,216	2,516,656	18,618,492	27,539,117	16,773,780	15,611,242	15,414,794	16,053,467	16,629,448
		12,749,178	36,150,525	89,579,242	120,758,840	46,380,008	26,329,287	17,892,774	16,971,191	18,510,689	18,927,897
check: net change debits and credits		0	(1)	0	1	0	0	1	0	0	0
Does balance sheet balance?		1	1	2	3	2	3	3	4	5	5
check: analysis of change in fixed assets		(0)	0	(0)	(0)	(0)	0	(0)	0	(0)	0
check: analysis of change in equity/RE		0	(0)	0	0	0	0	0	(0)	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	(0)	0	0	0	0	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		4,491,711	16,250,562	16,265,572	20,105,171	14,271,740	9,368,810	9,959,348	10 549,887	11,220,227	11,906,529
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,362,418)	(5,695,081)	(3,429,617)	(2,354,064)	(2,834,424)	(3,354,154)	(3,941,285)	(4,579,244)
Current depreciation		(167,912)	(951,922)	(2,336,376)	(4,117,479)	(5,064,797)	(5,377,0 1)	(5,709,069)	(6,060,732)	(6,434,739)	(6,831,624)
New capital expenditures, net		0	7,269,734	25,329,048	33,267,911	14,147,795	0	0	0	0	0
		2,317,407	14,767,764	32,892,826	43,560,521	19,925,121	1,637,656	1,415,855	1,135,001	844,203	495,662
Analysis of change in net equity/RE											
Net income		541,678	(1,470,736)	(7,386,498)	4,208,402	16,698,994	19,518,067	16,972,635	16,438,124	17,549,049	18,604,325
Revaluation surplus (direct cr. to equity)		4,491,711	16,250,562	16,265,572	20,105,171	14,271,740	9,368,810	9,959,348	10,549,887	11,220,227	11,906,529
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,362,418)	(5,695,081)	(3,429,617)	(2,354,064)	(2,834,424)	(3,354,154)	(3,941,285)	(4,579,244)
Dividends declared		0	0	0	0	0	(9,750,033)	(8,486,318)	(8,219,062)	(8,774,525)	(9,302,163)
		3,026,998	6,979,216	2,516,656	18,618,492	27,539,117	16,773,780	15,611,242	15,414,794	16,053,467	16,629,448
Analysis of change in long term debt:											
New debt issued		0	5,968,386	20,220,918	24,367,588	7,517,221	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(4,839,509)	(4,839,509)	(4,839,509)	(4,839,509)
		0	5,968,386	20,220,918	24,367,588	7,517,221	0	(4,839,509)	(4,839,509)	(4,839,509)	(4,839,509)

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INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		426,852	2,554,048	15,029,820	36,456,803	36,520,729	36,483,891	36,393,967	36,310,544	37,008,397	37,711,700
Natural Gas, Other		30,891,114	87,872,243	281,470,237	520,477,973	545,361,609	570,918,857	596,744,883	620,823,400	648,915,389	676,998,399
Natural Gas, Total		31,317,965	90,426,291	296,500,057	556,934,776	581,882,338	607,382,749	633,138,850	657,133,943	685,923,786	714,690,099
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	2,025,403	31,327,843	90,468,035	296,565,578	557,019,075	581,976,377	607,482,586	633,244,851	657,246,473	686,043,261	714,806,942
Other Revenues	2,822	23,230	96,169	154,083	198,243	221,148	234,784	249,279	264,634	280,965	298,294
TOTAL OPERATING INCOME	**2,028,225**	**31,351,073**	**90,564,204**	**296,719,662**	**557,217,319**	**582,197,525**	**607,717,370**	**633,494,130**	**657,511,108**	**686,324,225**	**715,105,237**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		156,007	919,457	5,410,735	13,124,449	13,147,462	13,127,001	13,101,828	13,071,796	13,323,023	13,576,212
Natural Gas, Other		27,528,460	78,009,913	248,935,335	458,583,688	478,706,302	501,139,586	523,809,397	544,944,984	569,603,506	594,227,817
Natural Gas, Total		27,684,467	78,929,371	254,346,070	471,708,137	491,853,764	514,266,587	536,911,225	558,016,780	582,926,531	607,804,029
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,709,700	27,709,983	79,037,200	254,515,316	471,925,888	492,096,674	514,524,774	537,185,035	558,307,455	583,235,144	608,131,676
Payroll (Wages & Bonus)	41,268	380,973	1,809,993	2,526,996	3,251,226	3,626,856	3,850,497	4,086,224	4,340,048	4,607,872	4,892,078
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	62,379	575,863	2,433,599	3,819,702	4,914,419	5,482,220	5,820,252	6,179,591	6,560,237	6,965,069	7,394,663
TOTAL OPERATING EXPENSES	**1,813,347**	**28,666,619**	**83,080,792**	**260,862,014**	**480,091,533**	**501,205,760**	**524,195,524**	**547,452,850**	**569,207,739**	**594,808,084**	**620,418,417**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**214,878**	**2,684,254**	**7,485,412**	**35,857,648**	**77,125,786**	**80,991,765**	**83,521,846**	**86,041,280**	**88,303,368**	**91,516,141**	**94,686,819**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
DEDUCTIONS											
Depreciation		167,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,479,986	12,188,053
Value Added Tax (on Sales)	83,720	602,977	1,905,139	7,008,377	14,182,198	14,979,951	15,492,969	16,009,969	16,480,836	17,134,686	17,779,211
Net Value Added Tax (on Projects)		0	2,448,501	7,885,641	8,933,855	(3,853,481)	(11,385,520)	(4,028,995)	0	0	0
Gas Rehabilitation Fund		361,786	1,143,083	4,205,926	8,509,319	8,987,970	9,295,781	9,605,982	9,893,902	10,280,812	10,657,527
TOTAL DEDUCTIONS	83,720	1,132,675	6,632,571	22,461,287	38,489,210	29,150,361	22,996,243	31,772,300	37,196,471	38,895,484	40,634,791
NET INCOME BEFORE INTEREST and TAXES	131,158	1,567,216	913,526	13,500,086	38,770,028	51,990,276	60,653,594	54,436,789	51,285,042	52,809,795	54,252,833
INTEREST and TAXES											
Interest Expenses		0	544,997	2,924,047	7,332,450	10,938,337	12,069,874	11,568,963	10,561,140	9,555,317	8,549,494
Currency fluctuation loss on debt			0	20,177,097	22,880,177	6,185,647	3,485,632	3,065,942	2,692,414	2,515,036	2,309,240
Taxes:											
Corporate Income Tax	64,943	858,981	2,395,332	11,474,447	24,600,251	25,917,365	26,728,991	27,533,210	28,257,078	29,285,165	30,299,782
Excess Payroll Tax	6,970	74,290	313,949	492,764	633,989	707,239	750,647	797,204	846,309	898,535	953,955
Property Tax		77,816	574,402	834,845	2,009,064	3,350,492	3,850,916	4,169,877	4,317,545	4,441,869	4,582,416
Road Tax		14,471	45,723	168,201	340,373	359,519	371,831	384,239	395,756	411,232	426,701
TOTAL INTEREST and TAXES	71,913	1,025,538	3,874,403	36,071,402	57,876,305	47,508,597	47,216,091	47,517,434	47,070,242	47,107,154	47,121,588
NET INCOME	59,245	541,678	(2,955,477)	(22,571,316)	(19,106,277)	4,481,678	13,467,504	6,919,355	4,214,801	5,702,641	7,131,245
Memo: Weighted Ave Cost of Gas		8,872	25,982	84,304	154,861	160,369	165,777	171,515	177,588	183,594	189,789
Memo: Weighted Ave Sales Price of Gas		10,189	30,082	98,968	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,162	3,825	14,070	28,078	29,354	30,017	30,740	31,544	32,439	33,373
Memo: Cash Flow From Natural Gas		3,633,499	11,496,920	42,153,968	85,228,640	90,028,574	93,115,862	96,227,625	99,117,163	102,997,255	106,876,070
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	223,965	2,067,575	10,805,147	15,781,800	19,712,260	21,750,889	22,964,555	24,254,722	25,621,389	27,074,894	28,617,305
Short-Term Investments	300	4,118,070	5,617,432	15,840,315	25,254,868	27,681,165	50,288,086	55,153,265	58,318,883	62,693,479	67,951,850
Cash & Short Term Investments	224,265	6,185,645	16,422,579	31,622,115	44,967,128	49,432,054	73,252,641	79,407,987	83,940,272	89,768,373	96,569,156
Accounts receivable – Gross *(See Note C.)*	298,783	4,621,415	13,345,646	43,748,702	82,170,230	85,851,876	89,614,496	93,414,889	96,955,556	101,203,594	105,446,749
Materials & equipment	17,563	162,136	685,187	1,075,449	1,383,670	1,543,536	1,638,710	1,739,883	1,847,055	1,961,037	2,081,990
Other assets	387	3,573	15,098	23,697	30,489	34,012	36,109	38,338	40,700	43,211	45,877
Total Current Assets	540,998	10,972,768	30,468,510	76,469,964	128,551,517	136,861,478	164,541,956	174,601,097	182,783,582	192,976,215	204,143,772
Fixed assets											
Adusted Cost of Fixed Assets	545,661	5,037,372	34,075,435	100,867,208	205,915,159	271,077,340	287,792,198	305,560,310	324,381,982	344,399,585	365,641,594
Less: Accumulated Depreciation	243,740	2,418,044	11,354,502	21,183,220	34,119,013	47,096,972	59,594,029	73,458,671	88,796,255	105,755,856	124,466,759
Net Revalued Assets	301,921	2,619,328	22,720,933	79,683,347	171,796,146	223,980,668	228,198,167	232,101,639	235,585,727	238,643,729	241,174,835
TOTAL ASSETS	842,919	13,592,096	53,189,443	156,153,310	300,347,662	360,842,146	392,740,123	406,702,736	418,369,309	431,619,944	445,318,608
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	478,675	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,787	150,461,767	156,378,009	163,360,080	170,333,425
Total Current Liabilities	478,675	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,787	150,461,767	156,378,009	163,360,080	170,333,425
Long Term Debt		0	10,899,948	47,581,001	99,067,990	120,698,740	120,698,740	110,640,512	100,582,284	90,524,055	80,465,827
Additional debt due to currency rate			0	20,177,097	43,057,275	49,242,921	52,708,553	51,126,621	48,722,424	45,736,458	42,164,123
Other Funds	296,377	2,736,060	11,562,589	18,148,286	23,349,536	26,047,291	27,653,358	29,360,659	31,169,195	33,092,645	35,133,746
Total Long Term Liabilities	296,377	2,736,060	22,462,538	85,906,383	165,474,801	195,988,952	201,060,652	191,127,792	180,473,903	169,353,159	157,793,696
Other Liabilities & Equity											
Net Revaluation Surplus		2,485,319	10,935,272	23,876,418	46,713,452	66,562,409	80,372,981	94,461,797	108,758,617	123,296,606	138,015,764
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529
Retained Earnings	56,136	597,816	(2,357,661)	(24,928,977)	(44,035,254)	(39,553,576)	(32,819,824)	(29,380,147)	(27,252,746)	(24,401,426)	(20,835,803)
Net Equity	67,667	3,094,665	3,589,140	(1,041,030)	2,689,727	27,020,362	47,564,686	65,113,179	81,517,400	98,906,709	117,191,490
TOTAL LIABILITIES & EQUITY	842,919	13,592,097	53,189,444	150,153,311	300,347,665	360,842,147	392,740,125	406,702,738	418,369,312	431,619,949	445,318,611

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		541,678	(2,955,477)	(22,571,316)	(19,106,277)	4,401,678	13,467,504	6,919,355	4,214,801	5,702,641	7,131,245
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		167,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,479,986	12,188,053
Currency fluctuation loss on L/T debt			0	20,177,097	22,880,177	6,185,647	3,465,632	3,065,942	2,692,414	2,515,036	2,309,240
Changes in assets and liabilities:											
Accounts receivable		(4,322,632)	(6,724,231)	(30,403,057)	(38,421,528)	(3,681,646)	(3,762,620)	(3,800,393)	(3,540,667)	(4,248,039)	(4,243,155)
Materials and supplies		(144,573)	(523,051)	(390,262)	(303,221)	(159,866)	(95,174)	(101,173)	(107,172)	(113,982)	(120,954)
Other assets		(3,186)	(11,525)	(8,599)	(6,792)	(3,523)	(2,097)	(2,229)	(2,362)	(2,512)	(2,665)
Accounts payable		7,262,497	14,376,394	49,159,192	60,895,179	5,649,696	6,281,954	6,346,980	5,916,242	6,982,071	6,973,344
Other funds		2,439,683	8,826,529	6,585,696	5,201,250	2,697,755	1,906,067	1,707,301	1,808,536	1,923,450	2,041,101
Net cash provided by operations		5,961,380	12,124,487	25,901,993	37,997,627	24,205,662	30,554,339	24,321,127	21,794,524	24,238,651	26,276,209
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,887,552)	(10,702,457)	(24,652,615)	(19,740,736)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(10,899,948)	(36,681,052)	(51,486,990)	(21,630,750)	0	0	0	0	0
Net cash used in investing activities		0	(12,787,500)	(47,383,509)	(76,139,605)	(41,371,486)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
Loss on Currency Fluctuation		0	0	0	0	0	0	(4,647,675)	(5,098,610)	(5,501,001)	(5,851,575)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(6,733,752)	(3,459,676)	(2,107,400)	(2,851,321)	(3,565,622)
Net cash provided (used in) financing activities		0	10,899,948	36,681,052	51,486,990	21,630,750	(6,733,752)	(18,165,781)	(17,262,239)	(18,410,550)	(19,475,426)
Net increase (decrease) in cash and cash equivalents		5,961,380	10,236,934	15,199,536	13,345,013	4,464,926	23,820,587	6,155,346	4,532,285	5,828,101	6,800,783
Cash and cash equivalents – beginning		224,265	6,185,645	16,422,579	31,622,115	44,967,128	49,432,054	73,252,641	79,407,987	83,940,272	89,768,373
Cash and cash equivalents – ending		6,185,645	16,422,579	31,622,115	44,967,128	49,432,054	73,252,641	79,407,987	83,940,272	89,768,373	96,569,156

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Case–S–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	544,513	545,661	5,037,372	34,075,435	100,867,266	205,915,159	271,077,640	287,792,196	305,560,310	324,361,982	344,399,585
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	544,513	5,037,372	21,267,934	53,483,757	129,775,554	229,706,154	287,792,196	305,560,310	324,361,982	344,399,585	365,641,594
New Investments (Current Year)	0	0	12,787,500	47,383,509	76,139,605	41,371,486	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	1,148										
Ending Value of Assets (Gross)	545,661	5,037,372	34,075,435	100,867,266	205,915,159	271,077,640	287,792,196	305,560,310	324,361,982	344,399,585	365,641,594
Accumulated Depreciation		243,740	2,418,044	11,354,502	21,163,920	34,119,913	47,096,972	59,594,029	73,458,671	88,796,255	105,755,856
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	243,740	2,250,132	10,218,654	17,821,678	27,255,175	38,061,051	50,000,955	63,273,328	77,983,523	94,275,870	112,278,706
Current Depreciation		187,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,479,966	12,188,053
Net Value of Assets	301,921	2,619,328	22,720,833	79,683,347	171,796,146	223,980,668	228,196,167	232,101,639	235,585,727	238,643,729	241,174,835
Accum. Revaluation Surplus		4,491,711	20,742,273	40,150,596	69,058,884	92,849,878	109,564,434	127,332,549	146,154,221	166,171,824	187,413,832
Accum. Reevaluated Depreciation		2,006,392	9,807,002	16,274,178	22,345,432	23,287,470	29,191,453	32,870,752	37,395,603	42,875,218	49,398,068
Net Reevaluation Surplus		2,485,319	10,935,272	23,876,418	46,713,452	66,562,409	80,372,981	94,461,797	108,758,617	123,296,606	138,015,764

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	222,285	216,676	210,817	204,805	198,692	192,495	186,236	179,941	173,625	171,309	168,988
Other	2,982,874	2,903,846	2,826,989	2,812,209	2,847,317	2,874,515	2,915,916	2,950,458	2,968,572	3,003,779	3,033,529
Total	3,205,159	3,120,522	3,037,806	3,017,014	3,046,009	3,067,010	3,102,152	3,130,399	3,142,197	3,175,088	3,202,517
Losses (%)											
Residential	1.5%	1.5%									
Other	1.5%	1.5%	1.1%	0.8%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	218,951	213,426	210,817	204,805	198,692	192,495	186,236	179,941	173,625	171,309	168,988
Other	2,938,131	2,860,288	2,795,185	2,781,117	2,836,640	2,874,515	2,915,916	2,950,458	2,968,572	3,003,779	3,033,529
Total	3,157,082	3,073,714	3,006,002	2,985,922	3,035,332	3,067,010	3,102,152	3,130,399	3,142,197	3,175,088	3,202,517
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,430	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,464	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Case-S-3

Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.20%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.20%	353.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,960	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Revaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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Case–S–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl V.A.T.)		2,000	12,115	73,386	183,464	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,464	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,464	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,464	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		20.7%	−13.0%	−28.3%	−11.1%	2.0%	5.9%	3.0%	1.8%	2.4%	3.0%
Average over Period 1993–2002							3.2%				
External Financing		0.0%	89.0%	82.3%	75.4%	70.3%	70.3%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993-US$ x 000)			300.00	1815.00	3962.00	3283.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			304	1,880	4,235	3,631	0	0	0	0	0
Duties on Foreign Suppliers			544,997	1,834,053	2,574,349	1,081,537	0	0	0	0	0
Domestic Supplier (Current-Rubles x 000)			1,342,555	8,868,405	22,078,265	18,659,199	0	0	0	0	0
Foreign Supplier (1993-US$ x 000)			4100.00	9578.00	10459.00	4040.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			4,149	9,923	11,181	4,468	0	0	0	0	0
Foreign Supplier (Current-Rubles x 000)			10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		709,591	(1,819,629)	(19,209,074)	(12,242,438)	13,517,599	23,060,577	17,104,699	15,027,533	17,162,628	19,319,298
Less Retirements			0	0	0	0	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
Less: Domestic Suppliers		0	(1,887,552)	(10,702,457)	(24,652,615)	(19,740,736)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(6,733,752)	(3,459,678)	(2,107,400)	(2,851,321)	(3,565,622)
Funds Available/(Required)		709,591	(3,707,181)	(29,911,531)	(36,895,053)	(6,223,137)	16,326,825	3,586,793	2,861,905	4,273,079	5,695,447
External Sources (Foreign Projects)		0	10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Accumulative Long-Term Debt			10,899,948	47,581,001	99,067,990	120,698,740	120,698,740	110,640,512	100,582,284	90,524,055	80,465,827
Retirements								10,058,228	10,058,228	10,058,228	10,058,228
Interest			544,997	2,924,047	7,332,450	10,988,337	12,069,874	11,586,983	10,581,140	9,555,317	8,549,494
Memo: Total Project		0	12,242,503	57,791,960	131,357,215	171,647,163	171,647,163	171,647,163	171,647,163	171,647,163	171,647,163
Memo: % Externally Financed		0.0%	89.0%	82.3%	75.4%	70.3%	70.3%				
Computation of ending retained earnings:											
Beginning retained earnings		55,138	597,816	(2,357,661)	(24,928,977)	(44,035,254)	(39,553,576)	(32,819,824)	(29,360,147)	(27,252,746)	(24,401,426)
adjusted net income		541,678	(2,955,477)	(22,571,316)	(19,106,277)	4,481,678	13,467,504	6,919,355	4,214,801	5,702,641	7,131,245
less: dividends		0	0	0	0	0	(6,733,752)	(3,459,678)	(2,107,400)	(2,851,321)	(3,565,622)
Ending retained earnings - to B/S		597,816	(2,357,661)	(24,928,977)	(44,035,254)	(39,553,576)	(32,819,824)	(29,360,147)	(27,252,746)	(24,401,426)	(20,835,803)

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Case–S–3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment											
VAT Payment			12,242,503								
VAT Recapture			2,448,501								
				(1,224,250)	(1,224,250)						
1995 Investment											
VAT Payment				45,549,457							
VAT Recapture				9,109,891							
					(4,554,946)	(4,554,946)					
1996 Investment											
VAT Payment					73,565,255						
VAT Recapture					14,713,051						
						(7,356,526)	(7,356,526)				
1998 Investment											
VAT Payment						40,269,949					
VAT Recapture						8,057,990					
							(4,028,995)	(4,028,995)			
Value Added Tax on Projects		0	2,448,501	9,109,891	14,713,051	8,057,990	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,224,250)	(5,779,196)	(11,911,471)	(11,385,520)	(4,028,995)	0	0	0
Net V.A.T. on Projects		0	2,448,501	7,885,641	8,933,855	(3,853,481)	(11,385,520)	(4,028,995)	0	0	0
On Sales											
(a) GAS & LPG Purchases		27,709,933	79,037,200	254,515,316	471,925,888	492,096,674	514,524,774	537,185,035	558,307,455	583,235,144	608,131,676
(b) Commodity = = Purchases / (1+VAT Rate)		23,091,652	65,864,334	212,096,096	393,271,573	410,080,562	428,770,645	447,654,196	465,256,213	486,029,287	506,776,397
(c) VAT Included = Line (b) – Line (b)		4,618,330	13,172,867	42,419,219	78,654,315	82,016,112	85,754,129	89,530,839	93,051,243	97,205,857	101,355,279
(d) GAS & LPG Sales		31,327,843	89,468,035	296,565,578	557,019,075	581,976,377	607,482,586	633,244,851	657,246,473	686,043,261	714,806,942
(e) Commodity = = Purchases / (1+VAT Rate)		26,106,536	75,390,029	247,137,962	464,182,563	484,980,314	506,235,488	527,704,042	547,705,395	571,702,717	595,672,452
(f) VAT Included = Line (d) – Line (e)		5,221,307	15,078,006	49,427,596	92,836,513	96,996,063	101,247,098	105,540,808	109,541,079	114,340,543	119,134,490
(g) Utility's VAT Liability = Line (f) – Line (c)		602,977	1,905,139	7,008,377	14,182,198	14,979,951	15,492,969	16,009,969	16,489,836	17,134,686	17,779,211
Test											
Margin on GAS & LPG Sales		3,617,861	11,430,835	42,050,262	85,093,187	89,879,703	92,957,811	96,059,816	98,939,018	102,808,117	106,675,268
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			47,581,001	99,067,990	120,698,740	120,698,740	110,640,512	100,582,284	90,524,055	80,465,827
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional rubls debt/expense to record – in US$			5,394	4,969	1,278	696	599	512	466	416
Additional ruble debt/expense to record – in rubles			20,177,097	22,880,177	6,185,647	3,465,632	3,065,942	2,692,414	2,515,036	2,309,240
cumulative			20,177,097	43,057,275	49,242,921	52,708,553	55,774,495	58,466,909	60,981,945	63,291,184
Computation of payment on additional L/T debt – 1/12th cumulative							4,647,875	5,096,610	5,501,001	5,851,575
							4,647,875	9,744,485	15,245,486	21,097,061

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	26.6%	15.2%	20.3%	10.1%	6.6%	6.0%	5.8%	6.0%	6.1%	6.3%	6.4%
Short-Term Investments	0.0%	30.3%	10.6%	10.1%	8.4%	7.7%	12.8%	13.6%	13.9%	14.5%	15.3%
Cash & Investments	26.6%	45.5%	30.9%	20.3%	15.0%	13.7%	18.7%	19.5%	20.1%	20.8%	21.7%
Accounts receivable	35.4%	34.0%	25.1%	28.0%	27.4%	23.8%	22.8%	23.0%	23.2%	23.4%	23.7%
Materials & equipment	2.1%	1.2%	1.3%	0.7%	0.5%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%
Other assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Current Assets	64.2%	80.7%	57.3%	49.0%	42.8%	37.9%	41.9%	42.9%	43.7%	44.7%	45.8%
Fixed assets											
Adjusted Cost of Fixed Assets	64.7%	37.1%	64.1%	64.6%	68.6%	75.1%	73.3%	75.1%	77.5%	79.8%	82.1%
Less: Accumulated Depreciation	28.9%	17.8%	21.3%	13.6%	11.4%	13.1%	15.2%	18.1%	21.2%	24.5%	28.0%
Net Revalued Assets	35.8%	19.3%	42.7%	51.0%	57.2%	62.1%	58.1%	57.1%	56.3%	55.3%	54.2%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	56.8%	57.1%	41.6%	45.7%	44.0%	38.2%	36.7%	37.0%	37.4%	37.8%	38.2%
Total Current Liabilities	56.8%	57.1%	41.6%	45.7%	44.0%	38.2%	36.7%	37.0%	37.4%	37.8%	38.2%
Long Term Debt	0.0%	0.0%	20.5%	30.5%	33.0%	33.4%	30.7%	27.2%	24.0%	21.0%	18.1%
Additional debt due to currency rate	0.0%	0.0%	0.0%	12.9%	14.3%	13.6%	13.4%	12.6%	11.6%	10.6%	9.5%
Other Funds	35.2%	20.1%	21.7%	11.6%	7.8%	7.2%	7.0%	7.2%	7.5%	7.7%	7.9%
Total Long Term Liabilities	35.2%	20.1%	42.2%	55.0%	55.1%	54.3%	51.2%	47.0%	43.1%	39.2%	35.4%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	18.3%	20.6%	15.3%	15.6%	18.4%	20.5%	23.2%	26.0%	28.6%	31.0%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	6.7%	4.4%	-4.4%	-16.0%	-14.7%	-11.0%	-8.4%	-7.2%	-6.5%	-5.7%	-4.7%
Net Equity	8.0%	22.8%	16.1%	-0.7%	0.9%	7.5%	12.1%	16.0%	19.5%	22.9%	26.3%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	540,996	10,972,766	30,468,510	76,469,964	128,551,517	136,861,478	154,541,956	174,601,097	182,783,582	192,976,215	204,143,772
Current liabilities	478,875	7,761,372	22,137,766	71,287,958	132,183,137	137,832,833	144,114,787	150,461,767	156,378,009	163,360,080	170,333,425
Working capital	62,123	3,211,396	8,330,744	5,182,006	(3,631,621)	(971,355)	20,427,169	24,139,330	26,405,573	29,616,135	33,810,347
Change in working capital		3,149,273	5,119,348	(3,148,738)	(8,813,627)	2,660,266	21,398,524	3,712,161	2,266,243	3,210,562	4,194,212
Current ratio	1.13	1.41	1.38	1.07	0.97	0.99	1.14	1.16	1.17	1.18	1.20
Capitalization Table:											
Debt	296,377	2,736,060	22,462,538	85,906,383	165,474,601	195,988,952	201,060,652	191,127,792	180,473,903	169,353,159	157,793,696
Equity	67,667	3,094,665	8,589,140	(1,041,030)	2,689,727	27,020,362	47,564,666	65,113,179	81,517,400	96,906,709	117,191,490
Percent debt	81.4%	46.9%	72.3%	101.2%	98.4%	87.9%	80.9%	74.6%	68.9%	63.1%	57.4%
Percent equity	18.6%	53.1%	27.7%	−1.2%	1.6%	12.1%	19.1%	25.4%	31.1%	36.9%	42.6%
Times Interest Earned:											
Net income	59,245	541,678	(2,955,477)	(22,571,316)	(19,106,277)	4,481,678	13,467,504	6,919,355	4,214,601	5,702,641	7,131,245
Add back: interest expense	0	0	544,997	2,924,047	7,332,450	10,988,337	12,069,874	11,566,963	10,561,140	9,555,317	8,549,494
depreciation	0	167,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,479,986	12,188,053
taxes	71,913	1,025,538	3,874,403	36,071,402	57,876,305	47,508,597	47,216,091	47,517,434	47,070,242	47,107.154	47,121,588
total	131,158	1,735,129	2,599,771	19,786,376	52,966,316	72,014,533	82,346,541	76,189,095	72,658,915	73,845,098	74,930,380
Interest	0	0	544,997	2,924,047	7,332,450	10,988,337	12,069,874	11,566,963	10,561,140	9,555,317	8,549,494
Time interest earned			4.8	6.8	7.2	6.6	6.8	6.6	6.9	7.7	8.8
Operating revenue	2,025,403	31,327,843	90,468,035	296,565,578	557,019,075	581,976,377	607,482,586	633,244,851	657,246,473	686,043,261	714,806,942
Operating expenses (B4 depr, tax)	1,813,347	29,666,819	83,080,792	260,862,014	480,091,533	501,205,760	524,195,524	547,452,850	569,207,739	594,808,084	620,418,417
Operating margin	212,056	2,661,024	7,387,243	35,703,564	76,927,542	80,770,617	83,287,062	85,792,001	88,038,734	91,235,176	94,388,525
Percent	10.5%	8.5%	8.2%	12.0%	13.8%	13.9%	13.7%	13.5%	13.4%	13.3%	13.2%
Net income to total revenue	2.9%	1.7%	−3.3%	−7.6%	−3.4%	0.8%	2.2%	1.1%	0.6%	0.8%	1.0%
Return on total assets	7.0%	4.0%	−5.6%	−14.5%	−6.4%	1.2%	3.4%	1.7%	1.0%	1.3%	1.6%
Return on beginning equity		800.5%	−95.5%	−262.8%	1835.3%	166.6%	49.8%	14.5%	6.5%	7.0%	7.2%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum. Deprec. / Assets	44.7%	48.0%	33.3%	21.0%	16.6%	17.4%	20.7%	24.0%	27.4%	30.7%	34.0%
Receivables / Sales	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case-S-3

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		5,961,380	10,238,934	15,199,536	13,045,013	4,464,926	23,820,587	6,155,346	4,532,285	5,828,101	6,800,783
Accounts receivable		4,322,632	8,724,231	30,403,057	38,421,528	3,681,646	3,762,620	3,800,393	3,540,667	4,248,039	4,243,155
Materials & equipment		144,573	523,051	390,262	306,221	159,860	95,174	101,173	107,172	113,982	120,954
Other assets		3,186	11,525	8,599	6,792	3,523	2,097	2,229	2,362	2,512	2,665
Net fixed assets		2,317,407	20,101,605	56,962,414	92,112,799	52,184,522	4,217,499	3,903,472	3,484,088	3,058,002	2,531,105
		12,749,178	39,597,346	102,963,868	144,194,353	60,494,483	31,897,977	13,962,613	11,666,574	13,250,636	13,698,662
Credits:											
Accounts payable		7,262,497	14,376,394	49,150,192	60,895,179	5,649,696	6,281,954	6,346,960	5,916,242	6,982,071	6,973,344
Long term debt		0	10,899,948	36,681,052	51,486,990	21,630,750	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
Currency fluctuation on L/T debt			0	20,177,097	22,880,177	6,185,647	3,465,632	(1,581,933)	(2,404,197)	(2,965,966)	(3,542,336)
Other funds		2,439,663	6,826,529	6,585,696	5,201,250	2,697,755	1,606,067	1,707,301	1,808,536	1,923,450	2,041,101
Equity/retained earnings		3,026,998	5,494,475	(9,630,170)	3,730,756	24,330,635	20,544,324	17,548,493	16,404,221	17,389,309	18,284,781
		12,749,178	39,597,346	102,963,867	144,194,352	60,494,483	31,897,977	13,962,613	11,666,574	13,250,636	13,698,662
check: net change debits and credits		0	0	(1)	(1)	0	0	0	0	0	0
Does balance sheet balance?		1	1	1	2	2	2	2	3	4	4
check: analysis of change in fixed assets		(0)	0	0	(0)	0	(0)	0	0	(0)	(0)
check: analysis of change in equity/RE		0	0	(0)	(0)	(0)	(0)	0	(0)	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	0	0	(0)	0	0	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		4,491,711	16,250,562	19,408,323	28,908,288	23,790,994	16,714,556	17,768,114	18,821,672	20,017,603	21,242,008
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,467,176)	(6,071,255)	(3,942,037)	(2,903,983)	(3,679,299)	(4,524,852)	(5,479,614)	(6,522,850)
Current depreciation		(167,912)	(1,135,848)	(3,362,242)	(6,863,839)	(9,035,921)	(9,593,073)	(10,185,344)	(10,812,733)	(11,479,966)	(12,188,053)
New capital expenditures, net		0	12,787,500	47,383,509	76,139,605	41,371,486	0	0	0	0	0
		2,317,407	20,101,605	56,962,413	92,112,799	52,184,522	4,217,499	3,903,472	3,484,088	3,058,002	2,531,105
Analysis of change in net equity/RE											
Net income		541,676	(2,955,477)	(22,571,316)	(19,106,277)	4,481,676	13,467,504	6,919,355	4,214,801	5,702,641	7,131,245
Revaluation surplus (direct cr. to equity)		4,491,711	16,250,562	19,408,323	28,908,288	23,790,994	16,714,556	17,768,114	18,821,672	20,017,603	21,242,008
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,467,176)	(6,071,255)	(3,942,037)	(2,903,983)	(3,679,299)	(4,524,852)	(5,479,614)	(6,522,850)
Dividends declared		0	0	0	0	0	(6,733,752)	(3,459,678)	(2,107,400)	(2,851,321)	(3,565,622)
		3,026,998	5,494,475	(9,630,170)	3,730,756	24,330,635	20,544,324	17,548,493	16,404,221	17,389,309	18,284,781
Analysis of change in long term debt:											
New debt issued		0	10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
		0	10,899,948	36,681,052	51,486,990	21,630,750	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)

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Case–S–4

INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		426,852	2,554,048	15,642,960	39,436,033	41,006,919	42,451,663	43,886,908	43,810,854	44,432,587	45,046,142
Natural Gas, Other		30,891,114	87,872,243	274,695,036	507,657,215	531,604,383	556,491,189	581,596,388	605,131,180	632,166,350	659,215,862
Natural Gas, Total		31,317,965	90,426,291	290,337,995	547,093,247	572,611,302	598,942,853	625,483,296	648,942,033	676,598,937	704,262,004
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	2,025,403	31,327,843	90,468,035	290,403,516	547,177,546	572,905,341	599,042,690	625,589,297	649,054,564	676,718,412	704,388,848
Other Revenues	2,822	23,230	98,169	154,083	198,243	221,148	234,784	249,279	264,634	280,965	298,294
TOTAL OPERATING INCOME	**2,028,225**	**31,351,073**	**90,566,204**	**290,557,600**	**547,375,790**	**573,126,489**	**599,277,474**	**625,838,576**	**649,319,198**	**676,999,377**	**704,687,142**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		156,007	919,457	5,631,466	14,196,972	14,762,491	15,282,599	15,799,287	15,771,907	15,995,731	16,218,611
Natural Gas, Other		27,528,460	78,009,913	242,943,273	447,287,550	466,806,070	488,475,599	510,512,385	531,170,702	554,901,574	578,645,034
Natural Gas, Total		27,684,467	78,929,371	248,574,738	461,484,522	481,568,561	503,758,198	526,311,672	546,942,610	570,897,305	594,861,645
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	1,709,700	27,709,983	79,037,200	248,743,984	461,702,273	481,811,471	504,016,086	526,585,481	547,233,285	571,205,919	595,189,293
Payroll (Wages & Bonus)	41,268	380,973	1,609,993	2,526,996	3,251,226	3,626,666	3,850,497	4,088,224	4,340,048	4,607,872	4,892,078
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	62,379	575,863	2,433,599	3,819,702	4,914,419	5,482,220	5,820,252	6,179,591	6,560,237	6,965,069	7,394,663
TOTAL OPERATING EXPENSES	**1,813,347**	**28,666,819**	**83,080,792**	**255,090,682**	**469,867,918**	**490,920,556**	**513,686,835**	**536,853,296**	**558,133,569**	**582,778,853**	**607,476,034**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**214,878**	**2,684,254**	**7,485,412**	**35,466,918**	**77,507,872**	**82,205,932**	**85,590,639**	**88,985,280**	**91,185,629**	**94,220,518**	**97,211,108**

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Case–S–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	**0**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		167,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,479,986	12,188,053
Value Added Tax (on Sales)	83,720	602,977	1,905,139	6,943,255	14,245,879	15,182,312	15,837,767	16,500,636	16,970,213	17,585,416	18,199,926
Net Value Added Tax (on Projects)		0	2,448,501	7,885,641	8,933,855	(3,853,481)	(11,385,520)	(4,028,695)	0	0	0
Gas Rehabilitation Fund		361,786	1,143,083	4,165,953	8,547,527	9,109,387	9,502,660	9,900,382	10,182,128	10,551,249	10,919,955
TOTAL DEDUCTIONS	**83,720**	**1,132,675**	**6,632,571**	**22,357,092**	**38,591,100**	**29,474,139**	**23,547,981**	**32,557,368**	**37,965,074**	**39,616,651**	**41,307,934**
NET INCOME BEFORE INTEREST and TAXES	**131,158**	**1,567,216**	**918,926**	**13,218,551**	**39,050,224**	**52,880,665**	**62,200,709**	**56,595,722**	**53,398,700**	**54,793,005**	**56,103,978**
INTEREST and TAXES											
Interest Expenses		0	544,997	2,924,047	7,332,450	10,986,337	12,069,874	11,566,963	10,561,140	9,555,317	8,549,494
Currency fluctuation loss on debt			0	20,177,097	22,880,177	6,185,647	3,465,632	3,065,942	2,692,414	2,515,036	2,309,240
Taxes:											
Corporate Income Tax	64,943	858,981	2,395,332	11,349,414	24,802,519	26,305,898	27,389,004	28,475,289	29,179,401	30,150,566	31,107,555
Excess Payroll Tax	6,970	74,290	313,949	492,764	633,989	707,239	750,847	797,204	846,309	898,535	953,955
Property Tax		77,816	574,402	834,845	1,966,209	3,318,763	3,806,149	4,149,071	4,302,979	4,432,230	4,575,865
Road Tax		14,471	45,723	168,638	341,901	364,375	380,106	396,015	407,285	422,050	436,796
TOTAL INTEREST and TAXES	**71,913**	**1,025,538**	**3,874,403**	**35,944,808**	**57,977,245**	**47,870,259**	**47,861,613**	**48,450,484**	**47,989,528**	**47,973,733**	**47,932,907**
NET INCOME	**59,245**	**541,678**	**(2,955,477)**	**(22,731,255)**	**(18,927,021)**	**5,010,406**	**14,339,095**	**8,145,238**	**5,409,172**	**6,819,272**	**8,171,071**
Memo: Weighted Ave Cost of Gas		8,872	25,982	84,044	154,234	159,502	164,678	170,187	176,261	182,283	188,496
Memo: Weighted Ave Sales Price of Gas		10,189	30,082	98,852	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,182	3,825	14,219	28,711	30,221	31,116	32,088	32,871	33,750	34,666
Memo: Cash Flow From Natural Gas		3,633,499	11,496,920	41,763,257	85,608,725	91,242,742	95,184,654	99,171,624	101,999,424	105,701,632	109,400,359
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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Case–S–4

BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	223,965	2,067,575	10,805,147	15,781,800	19,712,260	21,750,859	22,964,555	24,254,722	25,621,389	27,074,864	28,617,305
Short–Term Investments	300	4,118,070	5,617,432	14,972,880	23,862,423	26,686,535	49,573,551	54,910,517	58,619,506	63,452,042	69,135,830
Cash & Short Term Investments	224,265	6,185,645	16,422,579	30,754,680	43,574,683	48,437,424	72,538,106	79,165,239	84,240,895	90,526,936	97,753,136
Accounts receivable – Gross *(See Note C.)*	298,783	4,621,415	13,345,646	42,839,689	80,718,429	84,513,737	88,369,461	92,285,558	95,747,103	99,828,013	103,909,895
Materials & equipment	17,563	162,136	665,187	1,075,449	1,383,970	1,543,536	1,638,710	1,739,883	1,847,055	1,961,037	2,081,990
Other assets	387	3,573	15,098	23,697	30,489	34,012	36,109	38,338	40,700	43,211	45,877
Total Current Assets	540,998	10,972,768	30,468,510	74,693,515	125,707,271	134,528,708	162,582,386	173,229,019	181,875,752	192,359,197	203,790,897
Fixed assets											
Adusted Cost of Fixed Assets	545,661	5,037,372	34,075,435	100,867,265	205,915,159	271,077,640	287,792,196	305,560,310	324,381,982	344,399,585	365,641,594
Less: Accumulated Depreciation	243,740	2,418,044	11,354,502	21,183,920	34,119,013	47,098,972	59,594,029	73,459,671	88,798,255	105,755,856	124,466,759
Net Revalued Assets	301,921	2,619,328	22,720,933	79,683,347	171,796,146	223,980,668	228,198,167	232,101,639	235,585,727	238,643,729	241,174,835
TOTAL ASSETS	842,919	13,592,096	53,189,443	154,376,862	297,503,417	358,509,376	390,780,553	405,330,658	417,461,479	431,002,926	444,965,732
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	478,875	7,761,372	22,137,766	69,671,448	129,319,574	134,952,020	141,171,377	147,492,907	153,276,212	159,990,779	166,708,354
Total Current Liabilities	478,875	7,761,372	22,137,766	69,671,448	129,319,574	134,952,020	141,171,377	147,492,907	153,276,212	159,990,779	166,708,354
Long Term Debt		0	10,899,948	47,581,001	99,067,990	120,698,740	120,698,740	110,640,512	100,582,284	90,524,055	80,465,827
Additional debt due to currency rate			0	20,177,097	43,057,275	49,242,921	52,708,553	51,126,621	48,722,424	45,736,458	42,194,123
Other Funds	296,377	2,736,060	11,562,589	18,148,286	23,349,536	26,047,291	27,653,358	29,360,659	31,169,195	33,092,645	35,133,746
Total Long Term Liabilities	296,377	2,736,060	22,462,538	85,906,383	165,474,801	195,988,952	201,060,652	191,127,792	180,473,903	169,353,159	157,793,696
Other Liabilities & Equity											
Net Revaluation Surplus		2,485,319	10,935,272	23,876,418	46,713,452	66,562,409	80,372,981	94,461,797	108,758,617	123,296,606	138,015,764
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529	11,529
Retained Earnings	56,138	597,816	(2,357,661)	(25,088,916)	(44,015,937)	(39,005,531)	(31,835,983)	(27,783,364)	(25,058,778)	(21,649,142)	(17,563,607)
Net Equity	67,667	3,094,665	8,589,140	(1,200,969)	2,709,044	27,568,407	48,548,527	66,709,961	83,711,368	101,658,992	120,463,687
TOTAL LIABILITIES & EQUITY	842,919	13,592,097	53,189,441	154,376,863	297,503,419	358,509,379	390,780,556	405,330,660	417,461,483	431,002,930	444,965,736

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Case–S–4

Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		541,678	(2,955,477)	(22,731,255)	(18,927,021)	5,010,406	14,339,095	8,145,238	5,409,172	6,812,272	8,171,071
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		167,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,479,986	12,188,053
Currency fluctuation loss on L/T debt			0	20,177,097	22,880,177	6,185,647	3,465,632	3,065,942	2,692,414	2,515,036	2,309,240
Changes in assets and liabilities:											
Accounts receivable		(4,322,632)	(8,724,231)	(29,494,043)	(37,878,741)	(3,795,308)	(3,855,724)	(3,916,097)	(3,461,545)	(4,080,910)	(4,081,882)
Materials and supplies		(144,573)	(523,051)	(390,262)	(305,221)	(159,866)	(95,174)	(101,173)	(107,172)	(113,982)	(120,954)
Other assets		(3,186)	(11,525)	(8,599)	(6,792)	(3,523)	(2,097)	(2,229)	(2,362)	(2,512)	(2,665)
Accounts payable		7,282,497	14,376,394	47,533,682	59,648,126	5,632,445	6,219,357	6,321,530	5,783,305	6,714,567	6,717,575
Other funds		2,439,683	8,826,529	6,585,696	5,201,250	2,697,755	1,606,067	1,707,301	1,808,536	1,923,450	2,041,101
Net cash provided by operations		5,961,380	12,124,487	25,034,558	37,472,618	24,608,477	31,270,230	25,405,855	22,935,080	25,254,906	27,221,529
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,887,352)	(10,702,457)	(24,652,615)	(19,740,736)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(10,899,948)	(36,681,052)	(51,486,990)	(21,630,750)	0	0	0	0	0
Net cash used in investing activities		0	(12,787,500)	(47,383,509)	(76,139,605)	(41,371,486)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
Loss on Currency Fluctuation		0	0	0	0	0	0	(4,647,875)	(5,096,610)	(5,501,001)	(5,851,575)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(7,169,548)	(4,072,619)	(2,704,586)	(3,409,636)	(4,085,536)
Net cash provided (used in) financing activities		0	10,899,948	36,681,052	51,486,990	21,630,750	(7,169,548)	(18,778,722)	(17,859,424)	(18,968,865)	(19,995,339)
Net increase (decrease) in cash and cash equivalents		5,961,380	10,236,934	14,332,101	12,820,003	4,862,741	24,100,682	6,627,133	5,075,656	6,286,041	7,226,200
Cash and cash equivalents – beginning		224,265	6,185,645	16,422,579	30,754,680	43,574,683	48,437,424	72,538,106	79,165,239	84,240,895	90,526,936
Cash and cash equivalents – ending		6,185,645	16,422,579	30,754,680	43,574,683	48,437,424	72,538,106	79,165,239	84,240,895	90,526,936	97,753,136

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Case – S – 4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	544,513	545,661	5,037,372	34,075,435	100,867,266	205,915,159	271,077,640	287,792,196	305,560,310	324,381,982	344,399,585
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	544,513	5,037,372	21,287,934	53,483,757	129,775,554	229,706,154	287,792,196	305,560,310	324,381,982	344,399,585	365,641,594
New Investments (Current Year)	0	0	12,787,500	47,383,509	75,139,605	41,371,486	0	0	0	0	0
Capitalized Costs	0										
Work in Progress	1,148										
Ending Value of Assets (Gross)	545,661	5,037,372	34,075,435	100,867,266	205,915,159	271,077,640	287,792,196	305,560,310	324,381,982	344,399,585	365,641,594
Accumulated Depreciation		243,740	2,418,044	11,354,502	21,183,920	34,119,013	47,096,972	59,594,029	73,458,671	88,796,255	105,755,856
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	243,740	2,250,132	10,218,654	17,321,678	27,255,175	38,061,051	50,000,955	63,273,328	77,983,523	94,275,870	112,278,706
Current Depreciation		167,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,476,986	12,186,053
Net Value of Assets	301,921	2,619,328	22,720,933	79,683,347	171,796,146	223,980,668	228,196,167	232,101,639	235,585,727	238,643,729	241,174,835
Accum. Revaluation Surplus		4,491,711	20,742,273	40,150,596	69,058,834	92,849,878	109,564,434	127,332,549	146,154,221	166,171,824	187,413,632
Accum. Reevaluated Depreciation		2,006,392	9,807,002	16,274,178	22,345,432	26,287,470	29,191,453	32,870,752	37,395,603	42,875,218	49,398,068
Net Reevaluation Surplus		2,485,319	10,935,272	23,876,418	46,713,452	66,562,409	80,372,981	94,461,797	108,758,617	123,296,606	138,015,764

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Case–S–4

Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	222,285	216,676	210,817	213,160	214,929	216,141	216,818	216,958	200,489	205,675	201,854
Other	2,982,874	2,903,846	2,826,989	2,744,517	2,777,180	2,803,057	2,842,228	2,875,560	2,893,537	2,926,249	2,953,979
Total	3,205,159	3,120,522	3,037,806	2,957,677	2,992,109	3,019,198	3,059,046	3,092,548	3,103,026	3,131,924	3,155,833
Losses (%)											
Residential	1.5%	1.5%									
Other	1.5%	1.5%	1.1%	0.8%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	218,951	213,426	210,817	213,160	214,929	216,141	216,818	216,958	209,489	205,675	201,854
Other	2,938,131	2,860,288	2,795,185	2,723,933	2,766,766	2,803,057	2,842,228	2,875,560	2,893,537	2,926,249	2,953,979
Total	3,157,082	3,073,714	3,006,002	2,937,093	2,981,695	3,019,198	3,059,046	3,092,548	3,103,026	3,131,924	3,155,833
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,612	75,288	77,772	80,336
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Case–S–4

Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates:											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	653.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,960	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		20.7%	-13.0%	-28.5%	-11.0%	2.2%	6.3%	3.5%	2.3%	2.9%	3.4%
Average over Period 1998-2002							3.6%				
External Financing		0.0%	89.0%	82.3%	75.4%	70.3%	70.3%				

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FUNDING OF PROJECTS	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Proposed Project											
Domestic Supplier (1993–US$ x 000)			300.00	1815.00	3962.00	3283.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			304	1,880	4,235	3,631	0	0	0	0	0
Duties on Foreign Suppliers			544,997	1,834,053	2,574,349	1,081,537	0	0	0	0	0
Domestic Supplier (Current–Rubles x 000)			1,342,555	8,868,405	22,078,265	18,659,199	0	0	0	0	0
Foreign Supplier (1993–US$ x 000)			4100.00	9578.00	10459.00	4040.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			4,149	9,923	11,181	4,468	0	0	0	0	0
Foreign Supplier (Current–Rubles x 000)			10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		709,591	(1,819,629)	(19,369,013)	(12,083,182)	14,046,327	23,932,169	18,330,581	16,221,905	15,299,258	20,359,124
Less Retirements			0	0	0	0	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
Less Domestic Suppliers		0	(1,887,552)	(10,702,457)	(24,652,615)	(19,740,736)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(7,169,548)	(4,072,619)	(2,704,586)	(3,409,636)	(4,085,536)
Funds Available/(Required)		709,591	(3,707,181)	(30,071,470)	(36,715,797)	(5,694,409)	16,762,621	4,199,734	3,459,090	4,831,394	6,215,360
External Sources (Foreign Projects)		0	10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Accumulative Long–Term Debt			10,899,948	47,581,001	99,067,990	120,698,740	120,698,740	110,640,512	100,582,284	90,524,055	80,465,827
Retirements								10,058,228	10,058,228	10,058,228	10,058,228
Interest			544,997	2,924,047	7,332,450	10,988,337	12,069,874	11,566,933	10,561,140	9,555,317	8,549,494
Memo: Total Project		0	12,242,503	57,791,980	131,357,215	171,647,163	171,647,163	171,647,163	171,647,163	171,647,163	171,647,163
Memo: % Externally Financed		0.0%	89.0%	82.3%	75.4%	70.3%	70.3%				
Computation of ending retained earnings:											
Beginning retained earnings		56,138	597,816	(2,357,661)	(25,088,916)	(44,015,937)	(39,005,531)	(31,835,963)	(27,763,364)	(25,058,778)	(21,649,142)
adjusted net income		541,678	(2,955,477)	(22,731,255)	(18,927,021)	5,010,406	14,339,095	8,145,238	5,409,172	6,819,272	8,171,071
less: dividends		0	0	0	0	0	(7,169,548)	(4,072,619)	(2,704,586)	(3,409,636)	(4,085,536)
Ending retained earnings – to B/S		597,816	(2,357,661)	(25,088,916)	(44,015,937)	(39,005,531)	(31,835,963)	(27,763,364)	(25,058,778)	(21,649,142)	(17,563,607)

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Case–S–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment											
VAT Payment			12,242,503								
VAT Recapture			2,448,501								
				(1,224,250)	(1,224,250)						
1995 Investment											
VAT Payment				45,549,457							
VAT Recapture				9,109,891							
					(4,554,946)	(4,554,946)					
1995 Investment											
VAT Payment					73,565,255						
VAT Recapture					14,713,051						
						(7,356,526)	(7,356,526)				
1996 Investment											
VAT Payment						40,289,949					
VAT Recapture						8,057,990					
							(4,028,995)	(4,028,995)			
Value Added Tax on Projects		0	2,448,501	9,109,891	14,713,051	8,057,990	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,224,250)	(5,779,196)	(11,911,471)	(11,385,520)	(4,028,995)	0	0	0
Net V.A.T. on Projects		0	2,448,501	7,885,641	8,933,855	(3,853,481)	(11,385,520)	(4,028,995)	0	0	0
On Sales											
(a) GAS & LPG Purchases		27,709,983	79,037,200	248,743,984	461,702,273	481,811,471	504,016,086	526,585,481	547,233,285	571,205,919	595,189,293
(b) Commodity = = Purchases / (1+VAT Rate)		23,091,652	65,864,334	207,286,653	384,751,894	401,509,559	420,013,405	438,821,234	456,027,738	476,004,932	495,991,078
(c) VAT Included = Line (b) – Line (b)		4,618,330	13,172,867	41,457,331	76,950,379	80,301,912	84,002,681	87,764,247	91,205,548	95,200,986	99,198,216
(d) GAS & LPG Sales		31,327,843	90,468,035	290,403,516	547,177,546	572,905,341	599,042,690	625,589,297	649,054,564	676,718,412	704,388,846
(e) Commodity = = Purchases / (1+VAT Rate)		26,106,536	75,390,029	242,002,930	455,981,289	477,421,117	499,202,241	521,324,414	540,878,803	563,932,010	586,990,706
(f) VAT Included = Line (d) – Line (e)		5,221,307	15,078,006	48,400,586	91,196,258	95,484,223	99,840,448	104,264,883	108,175,761	112,786,402	117,398,141
(g) Utility's VAT Liability = Line (f) – Line (c)		602,977	1,905,139	6,943,255	14,245,879	15,182,312	15,837,767	16,500,636	16,970,213	17,585,416	18,199,926
Test											
Margin on GAS & LPG Sales		3,617,661	11,430,835	41,659,532	85,475,273	91,093,870	95,026,604	99,003,816	101,821,279	105,512,494	109,199,555
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			47,581,001	99,067,990	120,698,740	120,698,740	110,640,512	100,582,284	90,524,055	80,465,827
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179988
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			5,394	4,069	1,278	696	599	512	466	416
Additional ruble debt/expense to record – in rubles			20,177,097	22,880,177	6,185,647	3,465,632	3,065,942	2,692,414	2,515,036	2,309,240
cumulative			20,177,067	43,057,275	49,242,921	52,708,553	55,774,495	58,466,909	60,981,945	63,291,184
Computation of payment on additional L/T debt – 1/12th							4,647,875	5,096,610	5,501,001	5,851,575
cumulative							4,647,875	9,744,485	15,245,486	21,097,061

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Case–S–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	26.6%	15.2%	20.3%	10.2%	6.6%	6.1%	5.9%	6.0%	6.1%	6.3%	6.4%
Short–Term Investments	0.0%	30.3%	10.6%	9.7%	8.0%	7.4%	12.7%	13.5%	14.0%	14.7%	15.5%
Cash & Investments	26.6%	45.5%	30.9%	19.9%	14.6%	13.5%	18.6%	19.5%	20.2%	21.0%	22.0%
Accounts receivable	35.4%	34.0%	25.1%	27.8%	27.1%	23.6%	22.6%	22.8%	22.9%	23.2%	23.4%
Materials & equipment	2.1%	1.2%	1.3%	0.7%	0.5%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%
Other assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Current Assets	64.2%	80.7%	57.3%	48.4%	42.3%	37.5%	41.6%	42.7%	43.6%	44.6%	45.8%
Fixed assets											
Adusted Cost of Fixed Assets	64.7%	37.1%	64.1%	65.3%	69.2%	75.6%	73.6%	75.4%	77.7%	79.9%	82.2%
Less: Accumulated Depreciation	28.9%	17.8%	21.3%	13.7%	11.5%	13.1%	15.2%	18.1%	21.3%	24.5%	28.0%
Net Revalued Assets	35.8%	19.3%	42.7%	51.6%	57.7%	62.5%	58.4%	57.3%	56.4%	55.4%	54.2%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	56.8%	57.1%	41.6%	45.1%	43.5%	37.6%	36.1%	36.4%	36.7%	37.1%	37.5%
Total Current Liabilities	56.8%	57.1%	41.6%	45.1%	43.5%	37.6%	36.1%	36.4%	36.7%	37.1%	37.5%
Long Term Debt	0.0%	0.0%	20.5%	30.8%	33.3%	33.7%	30.9%	27.3%	24.1%	21.0%	18.1%
Additional debt due to currency rate	0.0%	0.0%	0.0%	13.1%	14.5%	13.7%	13.5%	12.6%	11.7%	10.6%	9.5%
Other Funds	35.2%	20.1%	21.7%	11.8%	7.8%	7.3%	7.1%	7.2%	7.5%	7.7%	7.9%
Total Long Term Liabilities	35.2%	20.1%	42.2%	55.6%	55.6%	54.7%	51.5%	47.2%	43.2%	39.3%	35.5%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	18.3%	20.6%	15.5%	15.7%	18.6%	20.6%	23.3%	26.1%	28.6%	31.0%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	6.7%	4.4%	−4.4%	−16.3%	−14.8%	−10.9%	−8.1%	−6.8%	−6.0%	−5.0%	−3.9%
Net Equity	8.0%	22.8%	16.1%	−0.8%	0.9%	7.7%	12.4%	16.5%	20.1%	23.6%	27.1%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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Case–S–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	540,998	10,972,768	30,468,510	74,693,515	125,707,271	134,528,708	162,582,386	173,229,019	181,875,752	192,359,197	203,790,897
Current liabilities	478,875	7,761,372	22,137,766	69,671,448	129,319,574	134,952,020	141,171,377	147,492,907	153,276,212	159,990,779	166,708,354
Working capital	62,123	3,211,396	8,330,744	5,022,067	(3,612,303)	(423,311)	21,411,009	25,736,112	28,599,541	32,368,418	37,082,543
Change in working capital		3,149,273	5,119,348	(3,308,677)	(8,634,370)	3,188,992	21,834,320	4,325,103	2,863,428	3,768,878	4,714,125
Current ratio	1.13	1.41	1.38	1.07	0.97	1.00	1.15	1.17	1.19	1.20	1.22
Capitalization Table:											
Debt	296,377	2,733,060	22,462,538	85,906,383	165,474,801	195,988,952	201,060,652	191,127,792	180,473,903	169,353,159	157,793,698
Equity	67,667	3,094,665	8,589,140	(1,200,969)	2,709,044	27,568,407	48,548,527	66,709,961	83,711,368	101,658,992	120,463,687
Percent debt	81.4%	46.9%	72.3%	101.4%	98.4%	87.7%	80.6%	74.1%	68.3%	62.5%	56.7%
Percent equity	18.6%	53.1%	27.7%	−1.4%	1.6%	12.3%	19.4%	25.9%	31.7%	37.5%	43.3%
Times Interest Earned:											
Net income	59,245	541,678	(2,955,477)	(22,731,255)	(18,927,021)	5,010,406	14,339,095	8,145,238	5,409,172	6,819,272	8,171,071
Add back: interest expense	0	0	544,997	2,924,047	7,332,450	10,988,337	12,069,874	11,566,963	10,561,140	9,555,317	8,549,494
depreciation	0	167,912	1,135,848	3,362,242	6,863,839	9,035,921	9,593,073	10,185,344	10,812,733	11,479,966	12,188,053
taxes	71,913	1,025,538	3,874,403	35,944,606	57,977,245	47,870,259	47,861,613	48,450,484	47,969,528	47,973,733	47,932,907
total	131,158	1,735,129	2,599,771	19,499,640	53,246,512	72,904,923	83,863,656	78,348,028	74,772,572	75,828,308	76,841,525
Interest	0	0	544,997	2,924,047	7,332,450	10,988,337	12,069,874	11,566,963	10,561,140	9,555,317	8,549,494
Time interest earned			4.8	6.7	7.3	6.6	6.9	6.8	7.1	7.9	9.0
Operating revenue	2,025,403	31,327,843	90,468,035	290,403,516	547,177,546	572,905,341	599,042,690	625,589,297	649,054,564	676,718,412	704,388,848
Operating expenses (B4 depr, tax)	1,813,347	28,666,819	83,080,792	255,090,682	469,867,918	490,920,553	513,688,835	536,853,296	558,133,569	582,778,859	607,476,034
Operating margin	212,056	2,661,024	7,387,243	35,312,834	77,309,628	81,984,785	85,355,855	88,736,000	90,920,995	93,939,553	96,912,814
Percent	10.5%	8.5%	8.2%	12.2%	14.1%	14.3%	14.2%	14.2%	14.0%	13.9%	13.8%
Net income to total revenue	2.9%	1.7%	−3.3%	−7.8%	−3.5%	0.9%	2.4%	1.3%	0.8%	1.0%	1.2%
Return on total assets	7.0%	4.0%	−5.6%	−14.7%	−6.4%	1.4%	3.7%	[illegible]	1.3%	1.6%	1.8%
Return on beginning equity		800.5%	−95.5%	−264.7%	1576.0%	185.0%	52.0%	16.8%	8.1%	8.1%	8.0%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum. Deprec. / Assets	44.7%	48.0%	33.3%	21.0%	16.6%	17.4%	20.7%	24.0%	27.4%	30.7%	34.0%
Receivables / Sales	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%	14.8%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	161.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case–S–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		5,961,380	10,236,934	14,332,101	12,820,003	4,862,741	24,100,682	6,627,133	5,075,655	6,286,041	7,226,200
Accounts receivable		4,322,632	8,724,231	29,494,043	37,878,741	3,795,308	3,855,724	3,916,097	3,461,545	4,080,910	4,081,882
Materials & equipment		144,573	523,051	390,262	308,221	159,866	95,174	101,173	107,172	113,982	120,954
Other assets		3,186	11,525	8,599	6,792	3,523	2,097	2,229	2,362	2,512	2,665
Net fixed assets		2,317,407	20,101,605	56,962,414	92,112,799	52,184,522	4,217,499	3,903,472	3,484,088	3,058,002	2,531,105
		12,749,178	39,597,346	101,187,419	143,126,556	61,005,960	32,271,176	14,550,104	12,130,822	13,541,447	13,962,806
Credits:											
Accounts payable		7,262,497	14,376,394	47,533,662	59,648,126	5,632,445	6,219,357	6,321,530	5,783,305	6,714,567	6,717,575
Long term debt		0	10,899,948	36,681,052	51,486,990	21,630,750	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
Currency fluctuation on L/T debt			0	20,177,097	22,880,177	6,185,647	3,465,632	(1,581,933)	(2,404,197)	(2,985,966)	(3,542,336)
Other funds		2,439,683	8,826,529	6,585,696	5,201,250	2,697,755	1,606,067	1,707,301	1,808,536	1,923,450	2,041,101
Equity/retained earnings		3,026,998	5,494,475	(9,790,109)	3,910,013	24,859,363	20,980,120	18,161,434	17,001,407	17,947,624	18,804,694
		12,749,178	39,597,346	101,187,418	143,126,556	61,005,960	32,271,176	14,550,104	12,130,823	13,541,447	13,962,806
check: net change debits and credits		0	0	(1)	0	0	0	0	1	0	0
Does balance sheet balance?		1	1	1	2	3	3	2	3	4	4
check: analysis of change in fixed assets		(0)	0	0	(0)	0	(0)	0	0	(0)	(0)
check: analysis of change in equity/RE		0	0	(0)	0	(0)	(0)	(0)	0	(0)	(0)
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	0	0	(0)	0	(0)	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		4,491,711	16,250,562	19,408,323	26,908,268	23,790,994	16,714,556	17,766,114	18,821,672	20,017,603	21,242,008
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,467,176)	(6,071,255)	(3,942,037)	(2,903,983)	(3,679,299)	(4,524,852)	(5,479,614)	(6,522,850)
Current depreciation		(167,912)	(1,135,848)	(3,362,242)	(6,863,839)	(9,035,921)	(9,593,073)	(10,185,344)	(10,812,733)	(11,479,966)	(12,188,053)
New capital expenditures, net		0	12,787,500	47,383,509	76,139,605	41,371,486	0	0	0	0	0
		2,317,407	20,101,605	56,962,414	92,112,799	52,184,522	4,217,499	3,903,472	3,484,088	3,058,002	2,531,105
Analysis of change in net equity/RE											
Net income		541,678	(2,955,477)	(22,731,255)	(18,927,021)	5,010,406	14,339,095	8,145,238	5,409,172	6,819,272	8,171,071
Revaluation surplus (direct cr. to equity)		4,491,711	16,250,562	19,408,323	26,908,268	23,790,994	16,714,556	17,766,114	18,821,672	20,017,603	21,242,008
Revaluation of accum depreciation		(2,006,392)	(7,800,610)	(6,467,176)	(6,071,255)	(3,942,037)	(2,903,983)	(3,679,299)	(4,524,852)	(5,479,614)	(6,522,850)
Dividends declared		0	0	0	0	0	(7,169,548)	(4,072,619)	(2,704,586)	(3,409,636)	(4,085,536)
		3,026,998	5,494,475	(9,790,109)	3,910,013	24,859,363	20,980,120	18,161,434	17,001,407	17,947,624	18,804,694
Analysis of change in long term debt:											
New debt issued		0	10,899,948	36,681,052	51,486,990	21,630,750	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)
		0	10,899,948	36,681,052	51,486,990	21,630,750	0	(10,058,228)	(10,058,228)	(10,058,228)	(10,058,228)

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INCOME STATEMENT
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		462,647	2,754,406	16,210,454	39,325,208	39,399,775	39,345,196	39,277,314	39,196,101	39,894,382	40,596,623
Natural Gas, Other		35,322,305	98,465,683	313,899,391	585,183,859	616,724,977	653,789,841	690,594,111	723,068,664	763,513,669	803,495,955
Natural Gas, Total		35,784,952	101,220,089	330,109,845	624,509,067	656,124,752	693,135,036	729,871,425	762,263,765	803,408,051	844,091,577
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,597,549	35,794,830	101,261,834	330,175,366	624,593,366	656,218,791	693,234,874	729,977,427	762,376,295	803,527,526	844,218,421
Other Revenues	4,020	33,091	139,844	219,495	282,402	315,030	334,455	355,104	376,977	400,240	424,926
TOTAL OPERATING INCOME	**3,601,569**	**35,827,921**	**101,401,678**	**330,394,861**	**624,875,768**	**656,533,821**	**693,569,328**	**730,332,530**	**762,753,272**	**803,927,766**	**844,643,348**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		168,235	991,586	5,835,763	14,157,075	14,183,919	14,164,271	14,139,833	14,110,236	14,361,978	14,614,424
Natural Gas, Other		31,318,318	87,304,029	278,317,081	518,849,886	546,815,636	579,678,983	612,311,277	641,104,651	676,964,981	712,415,044
Natural Gas, Total		31,486,553	88,295,615	284,152,844	533,006,961	560,999,555	593,843,254	626,451,110	655,214,888	691,326,959	727,029,468
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,447,017	31,512,069	88,403,445	284,322,090	533,224,712	561,242,465	594,101,142	626,724,920	655,505,563	691,635,572	727,357,116
Payroll (Wages & Bonus)	123,610	1,141,129	4,822,411	7,569,108	9,738,394	10,863,547	11,533,390	12,245,455	12,999,741	13,801,955	14,653,237
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	107,926	996,339	4,210,529	6,608,718	8,502,758	9,485,149	10,070,000	10,691,715	11,350,296	12,050,722	12,793,991
TOTAL OPERATING EXPENSES	**2,678,553**	**33,649,537**	**97,436,385**	**298,499,916**	**551,465,865**	**581,591,161**	**615,704,531**	**649,662,090**	**679,855,600**	**717,488,248**	**754,804,344**
EARNINGS BEFORE TAXES, SUBSIDIES AND DEPRECIATION	**923,016**	**2,178,385**	**3,965,293**	**31,894,945**	**73,409,903**	**74,942,660**	**77,864,797**	**80,670,440**	**82,897,673**	**86,439,518**	**89,839,004**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON-OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON-OPERATING INCOME	**0**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		384,878	1,856,616	3,663,425	6,244,375	8,087,941	8,586,641	9,116,775	9,678,343	10,275,593	10,909,375
Value Added Tax (on Sales)	792,292	713,794	2,143,065	7,642,213	15,228,109	15,829,388	16,522,289	17,208,751	17,811,789	18,648,659	19,476,884
Net Value Added Tax (on Projects)		0	1,318,841	3,668,667	6,068,146	(64,244)	(7,718,607)	(3,272,802)	0	0	0
Gas Rehabilitation Fund		428,276	1,285,839	4,585,328	9,136,865	9,497,633	9,913,373	10,325,251	10,687,073	11,189,195	11,686,131
TOTAL DEDUCTIONS	**792,292**	**1,526,948**	**6,604,361**	**19,559,631**	**36,677,495**	**33,350,717**	**27,303,696**	**33,377,974**	**38,177,205**	**40,113,447**	**42,072,390**
NET INCOME BEFORE INTEREST and TAXES	**130,724**	**667,075**	**(2,572,982)**	**12,439,039**	**36,865,863**	**41,740,814**	**50,719,152**	**47,460,275**	**44,898,613**	**46,515,209**	**47,967,418**
INTEREST and TAXES											
Interest Expenses		0	309,452	1,458,570	3,770,875	6,178,616	7,113,718	6,817,313	6,224,503	5,631,693	5,038,883
Currency fluctuation loss on debt			0	9,745,852	12,110,122	3,645,684	2,042,567	1,806,999	1,586,849	1,482,307	1,361,015
Taxes:											
Corporate Income Tax	41,816	697,083	1,268,894	10,206,382	23,491,169	23,981,651	24,916,735	25,814,541	26,527,255	27,660,646	28,748,481
Excess Payroll Tax	25,586	222,520	940,370	1,475,976	1,898,987	2,118,392	2,249,011	2,387,864	2,534,949	2,691,381	2,857,381
Property Tax		46,974	303,181	438,224	951,537	1,641,712	2,005,139	2,220,033	2,32[illegible],334	2,402,212	2,489,608
Road Tax		17,131	51,434	183,413	365,475	379,905	396,535	413,010	427,483	447,568	467,445
TOTAL INTEREST and TAXES	**67,402**	**983,708**	**2,873,330**	**23,508,417**	**42,588,165**	**37,945,980**	**38,723,705**	**39,459,759**	**39,623,374**	**40,315,806**	**40,962,814**
NET INCOME	**63,322**	**(316,634)**	**(5,446,313)**	**(11,069,379)**	**(5,722,306)**	**3,794,854**	**11,995,446**	**8,000,516**	**5,275,239**	**6,199,402**	**7,004,605**
Memo: Weighted Ave Cost of Gas		8,901	26,037	84,443	155,132	160,691	166,163	171,953	178,056	184,127	190,382
Memo: Weighted Ave Sales Price of Gas		10,219	30,129	99,025	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,227	3,847	13,786	28,884	27,506	28,048	28,659	29,370	30,138	30,949
Memo: Cash Flow From Natural Gas		4,298,399	12,924,474	45,957,001	91,502,106	95,125,197	99,291,783	103,420,315	107,048,877	112,081,092	117,062,109
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule

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BALANCE SHEET
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	47,997	443,093	2,315,606	3,382,131	4,224,452	4,661,342	4,921,[illegible]38	5,197,928	5,490,812	5,802,307	6,132,855
Short – Term Investments	0	2,732,839	6,154,177	12,692,294	18,822,754	22,192,007	40,926,129	49,654,256	57,070,371	65,465,211	74,646,791
Cash & Short Term Investments	**47,997**	3,175,932	8,469,782	16,074,425	23,047,206	26,853,348	45,847,567	54,852,184	62,561,183	71,267,518	80,779,646
Accounts receivable – Gross *(See Note C.)*	**179,378**	1,784,772	5,049,033	16,462,930	31,142,956	32,719,836	34,565,501	36,397,528	38,012,974	40,064,822	42,093,718
Materials & equipment	**12,947**	119,523	505,103	792,794	1,020,006	1,137,856	1,208,016	1,282,598	1,361,602	1,445,627	1,534,791
Other assets	**1,533**	14,152	59,307	93,871	120,775	134,729	143,036	151,867	161,222	171,171	181,728
Total Current Assets	241,855	5,094,379	14,083,726	33,424,020	55,330,943	60,845,769	81,764,120	92,684,176	102,096,981	112,949,137	124,589,882
Fixed assets											
Adusted Cost of Fixed Assets	1,250,729	11,546,340	55,698,487	109,902,737	187,331,254	242,638,227	257,599,218	273,503,236	290,350,281	308,267,789	327,281,247
Less: Accumulated Depreciation	983,749	9,466,542	41,862,221	69,369,084	95,494,452	114,615,616	130,269,417	147,428,946	166,188,505	186,719,586	209,145,523
Net Revalued Assets	266,980	2,079,798	13,836,265	40,533,654	91,836,803	128,022,610	127,329,801	126,074,290	124,161,776	121,548,203	118,135,724
TOTAL ASSETS	**508,835**	**7,174,177**	**27,919,991**	**73,957,674**	**147,167,745**	**188,868,379**	**209,093,921**	**218,758,467**	**226,258,757**	**234,497,340**	**242,725,607**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**203,587**	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Total Current Liabilities	203,587	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Long Term Debt		0	6,189,044	22,982,363	52,435,147	71,137,179	71,137,179	65,209,080	59,280,982	53,352,884	47,424,786
Additional debt due to currency rate			0	9,745,852	21,855,974	25,501,658	27,544,225	26,905,288	25,781,727	24,315,285	22,520,930
Other Funds	**287,441**	2,653,566	11,213,968	17,601,101	22,645,529	25,261,944	26,819,587	28,475,412	30,229,419	32,094,876	34,074,436
Total Long Term Liabilities	287,441	2,653,566	17,403,012	50,329,316	96,936,649	121,900,781	125,500,991	120,589,781	115,292,129	109,763,044	104,020,151
Other Liabilities & Equity											
Net Revaluation Surplus		2,197,696	8,907,124	16,787,837	28,404,673	39,015,300	46,909,131	54,770,395	62,536,224	70,198,243	77,695,139
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807
Retained Earnings	0	(316,634)	(5,762,946)	(16,832,325)	(22,554,631)	(18,759,777)	(12,762,054)	(8,761,796)	(6,124,176)	(3,024,475)	477,827
Net Equity	17,807	1,898,869	3,161,985	(26,681)	5,867,850	20,273,330	34,164,884	46,026,406	56,429,854	67,191,575	78,190,774
TOTAL LIABILITIES & EQUITY	**508,835**	**7,174,177**	**27,919,990**	**73,957,673**	**147,167,746**	**188,868,380**	**209,093,921**	**218,758,468**	**226,258,756**	**234,497,338**	**242,725,606**

Note B Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule
Note C No allowance has been made for bad debts

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		(316,634)	(5,446,313)	(11,069,379)	(5,722,306)	3,794,854	11,995,446	8,000,516	5,275,239	6,199,402	7,004,605
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		384,878	1,856,616	3,663,425	6,244,375	8,087,941	8,586,641	9,116,775	9,678,343	10,275,593	10,909,375
Currency fluctuation loss on L/T debt			0	9,745,852	12,110,122	3,645,684	2,042,567	1,806,999	1,586,849	1,482,307	1,361,015
Changes in assets and liabilities:											
Accounts receivable		(1,605,394)	(3,264,261)	(11,413,896)	(14,680,036)	(1,576,881)	(1,845,665)	(1,832,027)	(1,615,445)	(2,051,848)	(2,028,896)
Materials and supplies		(106,576)	(385,580)	(287,691)	(227,213)	(117,849)	(70,160)	(74,582)	(79,004)	(84,024)	(89,164)
Other assets		(12,619)	(45,655)	(34,064)	(26,903)	(13,964)	(8,307)	(8,831)	(9,355)	(9,949)	(10,558)
Accounts payable		2,418,155	4,733,251	16,300,046	20,708,208	2,331,022	2,733,777	2,714,234	2,394,493	3,005,946	2,971,962
Other funds		2,366,125	8,560,403	6,387,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Net cash provided by operations		**3,127,935**	**6,008,461**	**13,291,425**	**23,450,686**	**18,767,233**	**24,991,942**	**21,378,908**	**18,985,127**	**20,682,884**	**22,097,699**
Cash flows from investing activities:											
Note: Does not include internally – funded routine capital expenditures.											
Capital expenditures – Domestic		0	(714,611)	(5,686,781)	(16,477,904)	(14,961,090)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(6,189,044)	(16,793,319)	(29,452,783)	(18,702,032)	0	0	0	0	0
Net cash used in investing activities		**0**	**(6,903,655)**	**(22,480,100)**	**(45,930,688)**	**(33,663,122)**	**0**	**0**	**0**	**0**	**0**
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	6,189,044	16,793,319	29,452,783	18,702,032	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(5,928,096)	(5,928,098)	(5,928,098)	(5,928,098)
Loss on Currency Fluctuation		0	0	0	0	0	0	(2,445,935)	(2,710,410)	(2,948,749)	(3,155,370)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(5,997,723)	(4,000,258)	(2,637,620)	(3,099,701)	(3,502,302)
Net cash provided (used in) financing activities		**0**	**6,189,044**	**16,793,319**	**29,452,783**	**18,702,032**	**(5,997,723)**	**(12,374,291)**	**(11,276,128)**	**(11,976,549)**	**(12,585,771)**
Net increase (decrease) in cash and cash equivalents		3,127,935	5,293,850	7,604,643	6,972,781	3,806,142	18,994,219	9,004,617	7,708,999	8,706,335	9,512,128
Cash and cash equivalents – beginning		47,997	3,175,932	8,469,782	16,074,425	23,047,206	26,853,348	45,847,567	54,852,184	62,561,183	71,267,518
Cash and cash equivalents – ending		3,175,932	8,469,782	16,074,425	23,047,206	26,853,348	45,847,567	54,852,184	62,561,183	71,267,518	80,779,646

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	1,248,789	1,250,729	11,546,340	55,698,487	109,902,737	187,331,254	242,638,227	257,599,218	273,503,236	290,350,281	308,267,789
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,248,789	11,546,340	48,794,832	87,422,637	141,400,567	208,975,105	257,599,218	273,503,236	290,350,281	308,267,789	327,281,247
New Investments (Current Year)	0	0	6,903,655	22,480,100	45,930,688	33,663,122	0	0	0	0	0
Capitalized Costs	1,542										
Work in Progress	398										
Ending Value of Assets (Gross)	1,250,729	11,546,340	55,698,487	109,902,737	187,331,254	242,638,227	257,599,218	273,503,236	290,350,281	308,267,789	327,281,247
Accumulated Depreciation		983,749	9,466,542	41,862,221	69,369,084	95,494,452	114,615,616	130,269,417	147,428,946	166,188,505	186,719,586
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	983,749	9,081,664	40,005,605	65,705,659	89,250,077	106,527,675	121,682,777	138,312,172	156,510,162	176,443,993	198,236,148
Current Depreciation		384,878	1,856,616	3,663,425	6,244,375	8,087,941	8,586,641	9,116,775	9,678,343	10,275,593	10,909,375
Net Value of Assets	266,980	2,079,798	13,836,265	40,533,654	91,836,803	128,022,610	127,329,801	126,074,290	124,161,776	121,548,203	118,135,724
Accum. Revaluation Surplus		10,295,611	47,544,103	79,268,253	110,765,082	132,409,932	147,370,924	163,274,942	180,121,987	198,039,495	217,052,952
Accum. Reevaluated Depreciation		8,097,915	38,636,978	62,480,416	82,361,409	93,394,633	100,461,793	108,504,547	117,585,763	127,841,251	139,357,813
Net Reevaluation Surplus		2,197,696	8,907,124	16,787,837	28,404,673	39,015,300	46,909,131	54,770,395	62,536,224	70,198,243	77,695,139

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	239,706	233,660	227,355	220,893	214,325	207,670	200,952	194,197	187,418	184,668	181,911
Other	3,446,800	3,303,620	3,163,797	3,144,133	3,221,506	3,283,495	3,372,901	3,448,962	3,492,399	3,569,945	3,636,874
Total	3,686,506	3,537,280	3,391,152	3,365,028	3,435,831	3,491,165	3,573,853	3,643,159	3,679,817	3,754,613	3,818,785
Losses (%)											
Residential	1.0%	1.0%									
Other	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Natural Gas – Sales											
Residential	237,309	231,323	227,355	220,893	214,325	207,670	200,952	194,197	187,418	184,668	181,911
Other	3,412,332	3,270,584	3,132,159	3,112,692	3,189,291	3,250,660	3,339,172	3,414,472	3,457,475	3,534,246	3,600,505
Total	3,649,641	3,501,907	3,359,514	3,333,585	3,403,616	3,458,330	3,540,124	3,608,669	3,644,893	3,718,914	3,782,416
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,325	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,960	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		−15.2%	−39.4%	−27.3%	−6.2%	3.0%	9.4%	6.3%	4.2%	5.1%	5.9%
Average over Period 1998–2002							6.2%				
External Financing		0.0%	93.9%	81.4%	72.1%	67.5%	67.5%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993 – US$ x 000)			36.00	1034.00	2749.00	2445.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			36	1,071	2,939	2,704	0	0	0	0	0
Duties on Foreign Suppliers			309,452	839,666	1,472,639	935,102	0	0	0	0	0
Domestic Supplier (Current – Rubles x 000)			405,159	4,847,115	15,005,265	14,025,989	0	0	0	0	0
Foreign Supplier (1993 – US$ x 000)			2328.00	4385.00	5983.00	3493.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			2,356	4,543	6,396	3,863	0	0	0	0	0
Foreign Supplier (Current – Rubles x 000)			6,189,044	16,793,319	29,452,783	18,702,032	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		68,244	(3,589,697)	(7,405,954)	522,070	11,882,795	20,582,087	17,117,290	14,953,582	16,474,995	17,913,980
Less Retirements			0	0	0	0	0	(5,928,098)	(5,928,098)	(5,928,098)	(5,928,098)
Less Domestic Suppliers		0	(714,611)	(5,686,781)	(16,477,904)	(14,961,090)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(5,997,723)	(4,000,258)	(2,637,620)	(3,099,701)	(3,502,302)
Funds Available/(Required)		68,244	(4,304,308)	(13,092,735)	(15,955,835)	(3,078,296)	14,584,364	7,188,934	6,387,864	7,447,196	8,483,579
External Sources (Foreign Projects)		0	6,189,044	16,793,319	29,452,783	18,702,032	0	0	0	0	0
Accumulative Long – Term Debt			6,189,044	22,982,363	52,435,147	71,137,179	71,137,179	65,209,080	59,280,982	53,352,884	47,424,786
Retirements								5,928,098	5,928,098	5,928,098	5,928,098
Interest			309,452	1,458,570	3,770,875	6,178,616	7,113,718	6,817,313	6,224,503	5,631,693	5,038,883
Memo. Total Project		0	6,594,203	28,234,637	72,692,686	105,420,706	105,420,706	105,420,706	105,420,706	105,420,706	105,420,706
Memo. % Externally Financed		0.0%	93.9%	81.4%	72.1%	67.5%	67.5%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(316,634)	(5,762,946)	(16,832,325)	(22,554,631)	(18,759,777)	(12,762,054)	(8,761,796)	(6,124,176)	(3,024,475)
adjusted net income		(316,634)	(5,446,313)	(11,069,379)	(5,722,306)	3,794,854	11,995,446	8,000,516	5,275,239	6,199,402	7,004,605
less. dividends		0	0	0	0	0	(5,997,723)	(4,000,258)	(2,637,620)	(3,099,701)	(3,502,302)
Ending retained earnings – to B/S		(316,634)	(5,762,946)	(16,832,325)	(22,554,631)	(18,759,777)	(12,762,054)	(8,761,796)	(6,124,176)	(3,024,475)	477,827

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			6,594,203								
VAT Payment			1,318,841								
VAT Recapture				(659,420)	(659,420)						
1995 Investment				21,640,434							
VAT Payment				4,328,087							
VAT Recapture					(2,164,043)	(2,164,043)					
1995 Investment					44,458,049						
VAT Payment					8,891,610						
VAT Recapture						(4,445,805)	(4,445,805)				
1996 Investment						32,728,021					
VAT Payment						6,545,604					
VAT Recapture							(3,272,802)	(3,272,802)			
Value Added Tax on Projects		0	1,318,841	4,328,087	8,891,610	6,545,604	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(659,420)	(2,823,464)	(6,609,848)	(7,718,607)	(3,272,802)	0	0	0
Net V.A.T. on Projects		0	1,318,841	3,668,667	6,068,146	(64,244)	(7,718,607)	(3,272,802)	0	0	0
On Sales											
(a) GAS & LPG Purchases		31,512,069	88,403,445	284,322,090	533,224,712	561,242,465	594,101,142	626,724,920	655,505,503	691,635,572	727,357,116
(b) Commodity = = Purchases / (1 + VAT Rate)		26,260,057	73,669,537	236,935,075	444,353,927	467,702,054	495,084,285	522,270,766	546,254,636	576,362,977	606,130,930
(c) VAT Included = Line (b) – Line (b)		5,252,011	14,733,907	47,387,015	88,870,785	93,540,411	99,016,857	104,454,153	109,250,927	115,272,595	121,226,186
(d) GAS & LPG Sales		35,794,830	101,261,834	330,175,366	624,593,366	656,218,791	693,234,874	729,977,427	762,376,295	803,527,526	844,218,421
(e) Commodity = = Purchases / (1 + VAT Rate)		29,829,025	84,384,861	275,146,138	520,494,472	546,848,992	577,695,728	608,314,522	635,313,580	669,606,271	703,515,351
(f) VAT Included = Line (d) – Line (e)		5,965,805	16,876,972	55,029,228	104,098,894	109,369,798	115,539,146	121,662,904	127,062,716	133,921,254	140,703,070
(g) Utility's VAT Liability = Line (f) – Line (c)		713,794	2,143,065	7,642,213	15,228,109	15,829,388	16,522,289	17,208,751	17,811,789	18,648,659	19,476,884
Test											
Margin on GAS & LPG Sales		4,282,761	12,858,389	45,853,276	91,368,654	94,976,326	99,133,732	103,252,507	106,870,732	111,891,954	116,861,305
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			22,982,363	52,435,147	71,137,179	71,137,179	65,209,080	59,280,982	53,352,884	47,424,786
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			2,605	2,630	753	410	353	302	274	245
Additional ruble debt/expense to record – in rubles			9,745,852	12,110,122	3,645,084	2,042,567	1,806,999	1,586,849	1,482,307	1,361,015
cumulative			9,745,852	21,855,974	25,501,658	27,544,225	29,351,224	30,938,073	32,420,379	33,781,394
Computation of payment on additional L/T debt – 1/12th							2,445,935	2,710,410	2,948,749	3,155,370
cumulative							2,445,935	5,156,345	8,105,095	11,260,465

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	9.4%	6.2%	8.3%	4.6%	2.9%	2.5%	2.4%	2.4%	2.4%	2.5%	2.5%
Short – Term Investments	0.0%	38.1%	22.0%	17.2%	12.8%	11.7%	19.6%	22.7%	25.2%	27.9%	30.8%
Cash & Investments	9.4%	44.3%	30.3%	21.7%	15.7%	14.2%	21.9%	25.1%	27.7%	30.4%	33.3%
Accounts receivable	35.3%	24.9%	18.1%	22.3%	21.2%	17.3%	16.5%	16.6%	16.8%	17.1%	17.3%
Materials & equipment	2.5%	1.7%	1.8%	1.1%	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Other assets	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total Current Assets	47.5%	71.0%	50.4%	45.2%	37.6%	32.2%	39.1%	42.4%	45.1%	48.2%	51.3%
Fixed assets											
Adusted Cost of Fixed Assets	245.8%	160.9%	199.5%	148.6%	127.3%	128.5%	123.2%	125.0%	128.3%	131.5%	134.8%
Less: Accumulated Depreciation	193.3%	132.0%	149.9%	93.8%	64.9%	60.7%	62.3%	67.4%	73.5%	79.6%	86.2%
Net Revalued Assets	52.5%	29.0%	49.6%	54.8%	62.4%	67.8%	60.9%	57.6%	54.9%	51.8%	48.7%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	40.0%	36.5%	26.3%	32.0%	30.1%	24.7%	23.6%	23.8%	24.1%	24.5%	24.9%
Total Current Liabilities	40.0%	36.5%	26.3%	32.0%	30.1%	24.7%	23.6%	23.8%	24.1%	24.5%	24.9%
Long Term Debt	0.0%	0.0%	22.2%	31.1%	35.6%	37.7%	34.0%	29.8%	26.2%	22.8%	19.5%
Additional debt due to currency rate	0.0%	0.0%	0.0%	13.2%	14.9%	13.5%	13.2%	12.3%	11.4%	10.4%	9.3%
Other Funds	56.5%	37.0%	40.2%	23.8%	15.4%	13.4%	12.8%	13.0%	13.4%	13.7%	14.0%
Total Long Term Liabilities	56.5%	37.0%	62.3%	68.1%	65.9%	64.5%	60.0%	55.1%	51.0%	46.8%	42.9%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	30.6%	31.9%	22.7%	19.3%	20.7%	22.4%	25.0%	27.6%	29.9%	32.0%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	3.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	-4.4%	-20.6%	-22.8%	-15.3%	-9.9%	-6.1%	-4.0%	-2.7%	-1.3%	0.2%
Net Equity	3.5%	26.5%	11.3%	-0.0%	4.0%	10.7%	16.3%	21.0%	24.9%	28.7%	32.2%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	241,855	5,094,379	14,083,726	33,424,020	55,330,943	60,845,769	81,764,120	92,684,176	102,096,981	112,949,137	124,589,882
Current liabilities	203,587	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Working capital	38,268	2,472,637	6,728,733	9,768,982	10,967,696	14,151,500	32,336,074	40,541,896	47,560,207	55,406,419	64,075,201
Change in working capital		2,434,369	4,256,096	3,040,249	1,198,714	3,183,805	18,184,574	8,205,822	7,018,311	7,846,211	8,668,783
Current ratio	1.19	1.94	1.91	1.41	1.25	1.30	1.65	1.78	1.87	1.96	2.06
Capitalization Table:											
Debt	287,441	2,653,566	17,403,012	50,329,316	96,936,649	121,900,781	125,500,991	120,589,781	115,292,129	109,763,044	104,020,151
Equity	17,807	1,898,869	3,161,985	(26,681)	5,867,850	20,273,330	34,164,884	46,026,406	56,429,854	67,191,575	78,190,774
Percent debt	94.2%	58.3%	84.6%	100.1%	94.3%	85.7%	78.6%	72.4%	67.1%	62.0%	57.1%
Percent equity	5.8%	41.7%	15.4%	−0.1%	5.7%	14.3%	21.4%	27.6%	32.9%	38.0%	42.9%
Times Interest Earned:											
Net income	63,322	(316,634)	(5,446,313)	(11,069,379)	(5,722,306)	3,794,854	11,995,446	8,000,516	5,275,239	6,199,402	7,004,605
Add back: interest expense	0	0	309,452	1,458,570	3,770,875	6,178,616	7,113,718	6,817,313	6,224,503	5,631,693	5,038,883
depreciation	0	384,878	1,856,616	3,663,425	6,244,375	8,087,941	8,586,641	9,116,775	9,678,343	10,275,593	10,909,375
taxes	67,402	983,708	2,873,330	23,508,417	42,588,165	37,945,960	38,723,705	39,459,759	39,623,374	40,315,806	40,962,814
total	130,724	1,051,953	(406,914)	17,561,034	46,881,111	56,007,371	66,419,510	63,394,362	60,801,459	62,422,495	63,915,677
Interest	0	0	309,452	1,458,570	3,770,875	6,178,616	7,113,718	6,817,313	6,224,503	5,631,693	5,038,883
Time interest earned			−1.3	12.0	12.4	9.1	9.3	9.3	9.8	11.1	12.7
Operating revenue	3,597,549	35,794,830	101,261,834	330,175,366	624,593,366	656,218,791	693,234,874	729,977,427	762,376,295	803,527,526	844,218,421
Operating expenses (B4 depr, tax)	2,678,553	33,649,537	97,436,385	298,499,916	551,465,865	581,591,161	615,704,531	649,662,090	679,855,600	717,488,248	754,804,344
Operating margin	918,996	2,145,293	3,825,449	31,675,450	73,127,501	74,627,630	77,530,342	80,315,337	82,520,696	86,039,277	89,414,077
Percent	25.5%	6.0%	3.8%	9.6%	11.7%	11.4%	11.2%	11.0%	10.8%	10.7%	10.6%
Net income to total revenue	1.8%	−0.9%	−5.4%	−3.4%	−0.9%	0.6%	1.7%	1.1%	0.7%	0.8%	0.8%
Return on total assets	12.4%	−4.4%	−19.5%	−15.0%	−3.9%	2.0%	5.7%	3.7%	2.3%	2.6%	2.9%
Return on beginning equity		−1778.1%	−286.8%	−350.1%	21447.0%	64.7%	59.2%	23.4%	11.5%	11.0%	10.4%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum Deprec. / Assets	78.7%	82.0%	75.2%	63.1%	51.0%	47.2%	50.6%	53.9%	57.2%	60.6%	63.9%
Receivables / Sales	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Worksheet for Cash Flow Statement:	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Debits											
Cash and investments		3,127,935	5,293,850	7,604,643	6,972,781	3,806,142	18,994,219	9,004,617	7,709,000	8,706,335	9,512,128
Accounts receivable		1,605,394	3,264,261	11,413,896	14,680,026	1,576,881	1,845,665	1,832,027	1,615,445	2,051,848	2,028,896
Materials & equipment		106,576	385,580	287,691	227,213	117,849	70,160	74,582	79,004	84,024	89,164
Other assets		12,619	45,655	34,064	26,903	13,954	8,307	8,831	9,355	9,949	10,558
Net fixed assets		1,812,818	11,756,467	26,697,388	51,303,149	36,185,808	(692,809)	(1,255,510)	(1,912,514)	(2,613,573)	(3,412,479)
		6,665,342	20,745,813	46,037,682	73,210,072	41,700,634	20,225,542	9,664,547	7,500,290	8,238,583	8,228,267
Credits:											
Accounts payable		2,418,155	4,733,251	16,300,046	20,708,208	2,331,022	2,733,777	2,714,234	2,394,493	3,005,946	2,971,962
Long term debt		0	6,189,044	16,793,319	29,452,783	18,702,032	0	(5,928,098)	(5,928,098)	(5,928,098)	(5,928,098)
Currency fluctuation on L/T debt			0	9,745,852	12,110,122	3,645,684	2,042,567	(638,937)	(1,123,561)	(1,466,443)	(1,794,355)
Other funds		2,366,125	8,560,403	6,387,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Equity/retained earnings		1,881,062	1,263,116	(3,188,666)	5,894,531	14,405,480	13,891,554	11,861,522	10,403,448	10,761,721	10,999,199
		6,665,342	20,745,814	46,037,683	73,210,072	41,700,634	20,225,541	9,664,546	7,500,289	8,238,583	8,228,268
check: net change debits and credits		0	1	1	0	0	(1)	(1)	(1)	0	1
Does balance sheet balance?		(0)	(1)	(1)	1	0	0	1	(0)	(2)	(1)
check: analysis of change in fixed assets		(0)	(0)	(0)	0	0	0	0	0	0	(0)
check: analysis of change in equity/RE		(0)	0	0	0	(0)	(0)	(0)	(0)	0	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	(0)	0	0	0	0	(0)	(0)	(0)	0
Analysis of change in net fixed assets:											
Revaluation write up of assets		10,295,611	37,248,492	31,724,150	31,497,830	21,643,850	14,960,991	15,904,018	16,847,045	17,917,508	19,013,458
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,843,438)	(19,880,993)	(11,033,224)	(7,067,160)	(8,042,754)	(9,081,216)	(10,255,488)	(11,516,561)
Current depreciation		(384,878)	(1,856,610)	(3,663,425)	(6,244,375)	(8,087,941)	(8,586,641)	(9,116,775)	(9,678,343)	(10,275,593)	(10,909,375)
New capital expenditures, net		0	6,903,655	22,480,100	45,930,688	33,663,122	0	0	0	0	0
		1,812,818	11,756,467	26,697,388	51,303,149	36,185,808	(692,809)	(1,255,510)	(1,912,514)	(2,613,573)	(3,412,479)
Analysis of change in net equity/RE											
Net income		(316,634)	(5,446,313)	(11,069,379)	(5,722,306)	3,794,854	11,995,446	8,000,516	5,275,239	6,199,402	7,004,605
Revaluation surplus (direct cr. to equity)		10,295,611	37,248,492	31,724,150	31,497,830	21,643,850	14,960,991	15,904,018	16,847,045	17,917,508	19,013,458
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,843,438)	(19,880,993)	(11,033,224)	(7,067,160)	(8,042,754)	(9,081,216)	(10,255,488)	(11,516,561)
Dividends declared		0	0	0	0	0	(5,997,723)	(4,000,258)	(2,637,620)	(3,099,701)	(3,502,302)
		1,881,062	1,263,116	(3,188,666)	5,894,531	14,405,480	13,891,554	11,861,522	10,403,448	10,761,721	10,999,199
Analysis of change in long term debt:											
New debt issued		0	6,189,044	16,793,319	29,452,783	18,702,032	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(5,928,098)	(5,928,098)	(5,928,098)	(5,928,098)
		0	6,189,044	16,793,319	29,452,783	18,702,032	0	(5,928,098)	(5,928,098)	(5,928,098)	(5,928,098)

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INCOME STATEMENT
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		462,647	2,754,406	16,210,454	39,325,208	39,399,775	39,345,196	39,277,314	39,195,101	39,894,382	40,595,623
Natural Gas, Other		35,322,305	98,714,334	315,484,742	589,617,070	622,954,522	660,393,778	697,569,809	730,372,388	771,225,928	811,612,076
Natural Gas, Total		35,784,952	101,468,740	331,695,196	628,942,278	662,354,297	699,738,974	736,847,124	769,567,489	811,120,310	852,207,698
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,597,549	35,794 830	101,510,485	331,760,717	629,026,577	662,448,336	699,838,811	736,953,125	769,680,019	811,239,785	852,334,542
Other Revenues	4,020	33,091	139,844	219,495	282,402	315,030	334,455	355,104	376,977	400,240	424,926
TOTAL OPERATING INCOME	**3,601,569**	**35,827,921**	**101,650,329**	**331,980,212**	**629,308,979**	**662,763,366**	**700,173,266**	**737,308,228**	**770,056,996**	**811,640,025**	**852,759,468**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		168,235	991,586	5,835,763	14,157,075	14,183,919	14,164,271	14,139,833	14,110,236	14,361,978	14,614,424
Natural Gas, Other		31,318,318	87,304,029	278,317,081	518,849,886	546,815,636	579,678,983	612,311,277	641,104,651	676,964,981	712,415,044
Natural Gas, Total		31,486,553	88,295,615	284,152,844	533,006,961	560,999,555	593,843,254	626,451,110	655,214,888	691,326,959	727,029,468
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,447,017	31,512,069	88,403,445	284,322,090	533,224,712	561,242,465	594,101,142	626,724,920	655,505,563	691,635,572	727,357,116
Payroll (Wages & Bonus)	123,610	1,141,129	4,822,411	7,569,108	9,738,394	10,863,547	11,533,390	12,245,455	12,999,741	13,801,955	14,653,237
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	107,926	996,339	4,210,529	6,608,718	8,502,758	9,485,149	10,070,000	10,691,715	11,350,296	12,050,722	12,793,991
TOTAL OPERATING EXPENSES	**2,678,553**	**33,649,537**	**97,436,385**	**298,499,916**	**551,485,865**	**581,591,161**	**615,704,531**	**649,662,090**	**679,855,600**	**717,488,248**	**754,804,344**
EARNINGS BEFORE TAXES, SUSBSIDIES AND DEPRECIATION	**923,016**	**2,178,385**	**4,213,944**	**33,480,296**	**77,843,114**	**81,172,205**	**84,468,735**	**87,646,139**	**90,201,397**	**94,151,777**	**97,955,125**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	**0**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		384,878	1,871,141	3,843,091	5,935,853	7,120,443	7,559,487	8,026,205	8,520,597	9,046,403	9,604,371
Value Added Tax (on Sales)	792,292	713,794	2,184,507	7,906,438	15,966,977	16,867,645	17,622,945	18,371,367	19,029,076	19,934,035	20,829,571
Net Value Added Tax (on Projects)		0	1,409,470	4,517,769	2,417,239	(2,570,189)	(4,320,451)	(1,453,838)	0	0	0
Gas Rehabilitation Fund		428,276	1,310,704	4,743,863	9,580,186	10,120,587	10,573,767	11,022,820	11,417,446	11,960,421	12,497,743
TOTAL DEDUCTIONS	**792,292**	**1,528,948**	**6,775,821**	**21,011,161**	**33,900,256**	**31,538,487**	**31,435,748**	**35,966,555**	**38,967,119**	**40,940,860**	**42,931,684**
NET INCOME BEFORE INTEREST and TAXES	**130,724**	**667,075**	**(2,495,792)**	**12,572,860**	**44,076,311**	**49,782,590**	**53,191,037**	**51,847,392**	**51,412,423**	**53,400,055**	**55,224,244**
INTEREST and TAXES											
Interest Expenses		0	292,039	1,657,740	3,805,544	5,304,539	5,729,390	5,490,666	5,013,216	4,535,767	4,058,318
Currency fluctuation loss on debt			0	11,582,722	11,269,847	2,936,235	1,645,084	1,455,357	1,278,049	1,193,850	1,096,162
Taxes:											
Corporate Income Tax	41,816	697,083	1,348,462	10,713,695	24,909,796	25,975,106	27,029,995	28,046,764	28,864,447	30,128,569	31,345,640
Excess Payroll Tax	25,586	222,520	940,370	1,475,976	1,898,987	2,118,392	2,249,011	2,387,864	2,534,949	2,691,381	2,857,381
Property Tax		46,974	303,181	432,978	1,003,154	1,677,593	1,992,497	2,196,126	2,308,865	2,409,607	2,518,548
Road Tax		17,131	52,428	189,755	383,207	404,823	422,951	440,913	456,698	478,417	499,910
TOTAL INTEREST and TAXES	**67,402**	**983,708**	**2,936,480**	**26,052,865**	**43,270,536**	**38,416,687**	**39,068,929**	**40,017,690**	**40,456,225**	**41,437,591**	**42,375,959**
NET INCOME	**63,322**	**(316,634)**	**(5,432,272)**	**(13,480,005)**	**805,775**	**11,365,903**	**14,122,108**	**11,829,702**	**10,956,198**	**11,962,464**	**12,848,286**
Memo: Weighted Ave Cost of Gas		8,901	26,037	84,443	155,132	160,691	166,163	171,953	178,056	184,127	190,382
Memo: Weighted Ave Sales Price of Gas		10,219	30,132	99,034	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,227	3,912	14,196	27,988	29,032	29,631	30,302	31,076	31,906	32,780
Memo: Cash Flow From Natural Gas		4,298,399	13,173,125	47,542,351	95,935,317	101,354,742	105,895,721	110,396,013	114,352,601	119,793,351	125,178,230
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	47,997	443,093	2,315,606	3,382,131	4,224,452	4,661,342	4,921,438	5,197,928	5,490,812	5,802,307	6,132,855
Short – Term Investments	0	2,732,839	5,386,345	11,437,558	31,025,797	48,694,473	67,048,623	77,422,700	87,439,964	98,468,270	110,311,857
Cash & Short Term Investments	**47,997**	3,175,932	7,701,950	14,819,690	35,250,249	53,355,815	71,970,060	82,620,628	92,930,776	104,270,577	116,444,711
Accounts receivable – Gross *(See Note C.)*	**179,378**	1,784,772	5,061,431	16,541,977	31,364,001	33,030,449	34,894,782	36,745,345	38,377,146	40,449,364	42,498,397
Materials & equipment	**12,947**	119,523	505,103	792,794	1,020,006	1,137,856	1,208,016	1,282 598	1,361,602	1,445,627	1,534,791
Other assets	**1,533**	14,152	59,807	93,871	120,775	134,729	143,036	151,867	161,222	171,171	181,728
Total Current Assets	241,855	5,094,379	13,328,292	32,248,332	67,755,031	87,658,848	108,215,894	120,800,437	132,830,746	146,336,739	160,659,627
Fixed assets											
Adusted Cost of Fixed Assets	1,250,729	11,546,340	56,134,219	115,292,731	178,075,589	213,613,292	226,784,616	240,786,159	255,617,922	271,392,097	288,131,122
Less: Accumulated Depreciation	983,749	9,466,542	41,876,746	69,571,547	95,446,419	113,594,536	128,158,224	144,096,839	161,493,405	180,505,561	201,243,223
Net Revalued Assets	266,980	2,079,798	14,257,473	45,721,184	82,629,171	100,018,756	98,626,392	96,689,320	94,124,518	90,886,536	86,887,899
TOTAL ASSETS	**508,835**	**7,174,177**	**27,585,765**	**77,969,516**	**150,384,202**	**187,677,604**	**206,842,285**	**217,489,756**	**226,955,263**	**237,223,274**	**247,547,526**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**203,587**	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Total Current Liabilities	203,587	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Long Term Debt		0	5,840,777	27,314,014	48,796,873	57,293,903	57,293,903	52,519,411	47,744,919	42,970,427	38,195,935
Additional debt due to currency rate			0	11,582,722	22,852,569	25,788,804	27,433,888	26,481,808	25,139,412	23,520,858	21,638,204
Other Funds	**287,441**	2,653,566	11,213,968	17,601,101	22,645,529	25,261,944	26,819,587	28,475,412	30,229,419	32,094,876	34,074,436
Total Long Term Liabilities	287,441	2,653,566	17,054,745	56,497,837	94,294,971	108,344,651	111,547,378	107,476,631	103,113,750	98,586,161	93,908,575
Other Liabilities & Equity											
Net Revaluation Surplus		2,197,696	8,907,124	17,027,744	30,131,312	39,678,109	45,845,232	51,934,365	57,890,160	63,698,582	69,304,316
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807
Retained Earnings	0	(316,634)	(5,748,906)	(19,228,910)	(18,423,135)	(7,057,233)	3,821	5,918,672	11,396,771	17,378,003	23,802,146
Net Equity	17,807	1,898,869	3,176,026	(2,183,359)	11,725,984	32,638,683	45,866,860	57,870,844	69,304,738	81,094,392	93,124,269
TOTAL LIABILITIES & EQUITY	**508,835**	**7,174,177**	**27,585,764**	**77,969,516**	**150,384,202**	**187,677,603**	**206,642,284**	**217,489,756**	**226,955,262**	**237,223,272**	**247,547,525**

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		(316,634)	(5,432,272)	(13,480,005)	805,775	11,365,903	14,122,108	11,829,702	10,955,198	11,962,464	12,848,286
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		384,878	1,871,141	3,843,091	5,935,853	7,120,443	7,559,487	8,026,205	8,520,597	9,046,403	9,604,371
Currency fluctuation loss on L/T debt			0	11,582,722	11,269,847	2,936,235	1,645,084	1,455,357	1,278,049	1,193,850	1,096,162
Changes in assets and liabilities:											
Accounts receivable		(1,605,394)	(3,276,659)	(11,480,546)	(14,822,023)	(1,666,448)	(1,864,333)	(1,850,563)	(1,631,801)	(2,072,219)	(2,049,033)
Materials and supplies		(106,576)	(385,580)	(287,691)	(227,213)	(117,849)	(70,160)	(74,582)	(79,004)	(84,024)	(89,164)
Other assets		(12,619)	(45,655)	(34,064)	(26,903)	(13,954)	(8,307)	(8,831)	(9,355)	(9,949)	(10,558)
Accounts payable		2,418,155	4,733,251	16,300,046	20,708,208	2,331,022	2,733,777	2,714,234	2,394,493	3,005,946	2,971,962
Other funds		2,366,125	6,560,403	6,387,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Net cash provided by operations		**3,127,935**	**6,024,629**	**12,830,686**	**28,687,972**	**24,571,767**	**25,675,300**	**23,747,348**	**23,183,184**	**24,907,929**	**26,351,585**
Cash flows from investing activities:											
Note: Does not include internally-funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,498,610)	(5,712,946)	(8,257,412)	(6,466,202)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(5,840,777)	(21,473,236)	(21,482,859)	(8,497,030)	0	0	0	0	0
Net cash used in investing activities		**0**	**(7,339,387)**	**(27,186,182)**	**(29,740,272)**	**(14,963,232)**	**0**	**0**	**0**	**0**	**0**
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	5,840,777	21,473,236	21,482,859	8,497,030	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(4,774,492)	(4,774,492)	(4,774,492)	(4,774,492)
Loss on Currency Fluctuation		0	0	0	0	0	0	(2,407,437)	(2,620,445)	(2,812,404)	(2,978,816)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(7,061,054)	(5,914,851)	(5,478,099)	(5,981,232)	(6,424,143)
Net cash provided (used in) financing activities		**0**	**5,840,777**	**21,473,236**	**21,482,859**	**8,497,030**	**(7,061,054)**	**(13,096,780)**	**(12,873,036)**	**(13,568,128)**	**(14,177,451)**
Net increase (decrease) in cash and cash equivalents		3,127,935	4,526,018	7,117,740	20,430,559	18,105,566	18,614,245	10,650,568	10,310,148	11,339,801	12,174,134
Cash and cash equivalents – beginning		47,997	3,175,932	7,701,950	14,819,690	35,250,249	53,355,815	71,970,060	82,620,628	92,930,776	104,270,577
Cash and cash equivalents – ending		3,175,932	7,701,950	14,819,690	35,250,249	53,355,815	71,970,060	82,620,628	92,930,776	104,270,577	116,444,711

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	1,248,[illegible]39	1,250,729	11,546,340	56,134,219	115,292,731	178,075,589	213,613,292	226,784,616	240,786,159	255,617,922	271,392,097
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,248,789	11,546,340	48,794,832	88,106,549	148,335,318	198,650,060	226,784,616	240,786,159	255,617,922	271,392,097	288,131,122
New Investments (Current Year)	0	0	7,339,387	27,186,182	29,740,272	14,963,232	0	0	0	0	0
Capitalized Costs	1,542										
Work in Progress	398										
Ending Value of Assets (Gross)	1,250,729	11,546,340	56,134,219	115,292,731	178,075,589	213,613,292	226,784,616	240,786,159	255,617,922	271,392,097	288,131,122
Accumulated Depreciation		983,749	9,466,542	41,876,746	69,571,5[illegible]7	95,446,419	113,594,536	128,158,224	144,096,839	161,493,405	180,505,561
Reevaluation Rate		8.232	3.226	0.570	0.2[illegible]7	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	983,749	9,081,664	40,005,605	65,728,456	89,510,566	106,474,093	120,598,737	136,070,634	152,972,807	171,459,158	191,638,852
Current Depreciation		384,878	1,871,141	3,843,091	5,935,853	7,120,443	7,559,487	8,026,205	8,520,597	9,046,403	9,604,371
Net Value of Assets	266,980	2,079,798	14,257,473	45,721,184	82,629,171	100,018,756	98,626,392	96,689,320	94,124,518	90,886,536	86,887,899
Accum. Revaluation Surplus		10,295,611	47,544,103	79,516,432	112,559,020	133,133,490	146,304,814	160,306,357	175,138,121	190,912,295	207,651,320
Accum. Reevaluated Depreciation		8,097,915	38,636,978	62,488,688	82,427,[illegible]07	93,455,381	100,459,582	108,371,992	117,247,960	127,213,714	138,347,004
Net Reevaluation Surplus		2,197,696	8,907,124	17,027,744	30,131,312	39,678,109	45,845,232	51,934,365	57,890,160	63,698,582	69,304,316

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	239,706	233,660	227,355	220,893	214,325	207,670	200,952	194,197	187,418	184,668	181,911
Other	3,446,800	3,303,620	3,163,797	3,144,133	3,221,506	3,283,495	3,372,901	3,448,962	3,492,399	3,569,945	3,636,874
Total	3,686,506	3,537,280	3,391,152	3,365,028	3,435,831	3,491,165	3,573,853	3,643,159	3,679,817	3,754,613	3,818,785
Losses (%)											
Residential	1.0%	1.0%									
Other	1.0%	1.0%	0.8%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	237,309	231,323	227,355	220,893	214,325	207,670	200,952	194,197	187,418	184,668	181,911
Other	3,412,332	3,270,584	3,140,069	3,128,412	3,213,452	3,283,495	3,372,901	3,448,962	3,492,399	3,569,945	3,636,874
Total	3,649,641	3,501,907	3,367,424	3,349,305	3,427,777	3,491,165	3,573,853	3,643,159	3,679,817	3,754,613	3,818,785
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,980	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		−15.2%	−38.1%	−29.5%	1.0%	11.4%	14.3%	12.2%	11.6%	13.2%	14.8%
Average over Period 1998–2002							13.2%				
External Financing		0.0%	82.9%	82.4%	78.9%	75.0%	75.0%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993–US$ x 000)			344.00	920.00	1241.00	1049.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			348	953	1,327	1,160	0	0	0	0	0
Duties on Foreign Suppliers			292,039	1,073,662	1,074,143	424,851	0	0	0	0	0
Domestic Supplier (Current–Rubles x 000)			1,206,571	4,639,284	7,183,270	6,041,351	0	0	0	0	0
Foreign Supplier (1993–US$ x 000)			2197.00	5607.00	4364.00	1587.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			2,223	5,809	4,665	1,755	0	0	0	0	0
Foreign Supplier (Current–Rubles x 000)			5,840,777	21,473,236	21,482,859	8,497,030	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		68,244	(3,561,131)	(9,636,914)	6,741,628	18,486,346	21,681,595	19,855,907	19,476,795	21,008,868	22,452,656
Less Retirements			0	0	0	0	0	(4,774,492)	(4,774,492)	(4,774,492)	(4,774,492)
Less Domestic Suppliers		0	(1,498,610)	(5,712,946)	(8,257,412)	(6,466,202)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(7,061,054)	(5,914,851)	(5,478,099)	(5,981,232)	(6,424,143)
Funds Available/(Required)		68,244	(5,059,741)	(15,349,859)	(1,515,785)	12,020,143	14,620,541	9,168,564	9,224,204	10,253,144	11,254,022
External Sources (Foreign Projects)		0	5,840,777	21,473,236	21,482,859	8,497,030	0	0	0	0	0
Accumulative Long–Term Debt			5,840,777	27,314,014	48,796,873	57,293,903	57,293,903	52,519,411	47,744,919	42,970,427	38,195,935
Retirements								4,774,492	4,774,492	4,774,492	4,774,492
Interest			292,039	1,657,740	3,805,544	5,304,539	5,729,390	5,490,666	5,013,216	4,535,767	4,058,318
Memo: Total Project		0	7,047,348	33,159,869	61,825,997	76,364,378	76,364,378	76,364,378	76,364,378	76,364,378	76,364,378
Memo: % Externally Financed		0.0%	82.9%	82.4%	78.9%	75.0%	75.0%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(316,634)	(5,748,906)	(19,228,910)	(18,423,136)	(7,057,233)	3,821	5,918,672	11,396,771	17,378,003
adjusted net income		(316,634)	(5,432,272)	(13,480,005)	805,775	11,365,903	14,122,108	11,829,702	10,956,198	11,962,464	12,848,286
less: dividends		0	0	0	0	0	(7,061,054)	(5,914,851)	(5,478,099)	(5,981,232)	(6,424,143)
Ending retained earnings – to B/S		(316,634)	(5,748,906)	(19,228,910)	(18,423,136)	(7,057,233)	3,821	5,918,672	11,396,771	17,378,003	23,802,146

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment											
VAT Payment			7,047,348								
VAT Recapture			1,409,470								
				(704,735)	(704,735)						
1995 Investment											
VAT Payment				26,112,520							
VAT Recapture				5,222,504							
					(2,611,252)	(2,611,252)					
1995 Investment											
VAT Payment					28,666,129						
VAT Recapture					5,733,226						
						(2,866,613)	(2,866,613)				
1996 Investment											
VAT Payment						14,538,380					
VAT Recapture						2,907,676					
							(1,453,838)	(1,453,838)			
Value Added Tax on Projects		0	1,409,470	5,222,504	5,733,226	2,907,676	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(704,735)	(3,315,987)	(5,477,865)	(4,320,451)	(1,453,838)	0	0	0
Net V.A.T. on Projects		0	1,409,470	4,517,769	2,417,239	(2,570,189)	(4,320,451)	(1,453,838)	0	0	0
On Sales											
(a) GAS & LPG Purchases		31,512,069	88,403,445	284,322,090	533,224,712	561,242,465	594,101,142	626,724,920	655,505,563	691,635,572	727,357,116
(b) Commodity = = Purchases / (1+VAT Rate)		26,260,057	73,669,537	236,935,075	444,353,927	467,702,054	495,084,285	522,270,766	546,254,636	576,362,977	606,130,930
(c) VAT Included = Line (b) – Line (b)		5,252,011	14,733,907	47,387,015	88,870,785	93,540,411	99,016,857	104,454,153	109,250,927	115,272,595	121,226,186
(d) GAS & LPG Sales		35,794,830	101,510,485	331,760,717	629,026,577	662,448,335	699,838,811	736,953,125	769,680,019	811,239,785	852,334,542
(e) Commodity = = Purchases / (1+VAT Rate)		29,829,025	84,592,070	276,467,264	524,188,814	552,040,280	583,199,010	614,127,604	641,400,016	676,033,154	710,278,785
(f) VAT Included = Line (d) – Line (e)		5,965,805	16,918,414	55,293,453	104,837,763	110,408,056	116,639,802	122,825,521	128,280,003	135,206,631	142,055,757
(g) Utility's VAT Liability = Line (f) – Line (c)		713,794	2,184,507	7,906,438	15,966,977	16,867,645	17,622,945	18,371,367	19,029,076	19,934,035	20,829,571
Test											
Margin on GAS & LPG Sales		4,282,761	13,107,040	47,438,626	95,801,865	101,205,671	105,737,670	110,228,205	114,174,456	119,604,213	124,977,426
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			27,314,014	48,796,873	57,293,903	57,293,903	52,519,411	47,744,919	42,970,427	38,195,935
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			3,096	2,447	607	330	284	243	221	197
Additional ruble debt/expense to record – in rubles			11,582,722	11,269,847	2,936,235	1,645,084	1,455,357	1,278,049	1,193,850	1,096,162
cumulative			11,582,722	22,852,569	25,788,804	27,433,888	28,889,245	30,167,294	31,361,144	32,457,306
Computation of payment on additional L/T debt – 1/12th							2,407,437	2,620,445	2,812,404	2,978,816
cumulative							2,407,437	5,027,882	7,840,286	10,819,102

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VOLGOGRAD
Case – VL – 2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	9.4%	6.2%	8.4%	4.3%	2.8%	2.5%	2.4%	2.4%	2.4%	2.4%	2.5%
Short – Term Investments	0.0%	38.1%	19.5%	14.7%	20.6%	25.9%	32.4%	35.6%	38.5%	41.5%	44.6%
Cash & Investments	9.4%	44.3%	27.9%	19.0%	23.4%	28.4%	34.8%	38.0%	40.9%	44.0%	47.0%
Accounts receivable	35.3%	24.9%	18.3%	21.2%	20.9%	17.6%	16.9%	16.9%	16.9%	17.1%	17.2%
Materials & equipment	2.5%	1.7%	1.8%	1.0%	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Other assets	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total Current Assets	47.5%	71.0%	48.3%	41.4%	45.1%	46.7%	52.3%	55.5%	58.5%	61.7%	64.9%
Fixed assets											
Adusted Cost of Fixed Assets	245.8%	160.9%	203.5%	147.9%	118.4%	113.8%	109.6%	110.7%	112.6%	114.4%	116.4%
Less: Accumulated Depreciation	193.3%	132.0%	151.8%	89.2%	63.5%	60.5%	62.0%	66.3%	71.2%	76.1%	81.3%
Net Revalued Assets	52.5%	29.0%	51.7%	58.6%	54.9%	53.3%	47.7%	44.5%	41.5%	38.3%	35.1%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	40.0%	36.5%	26.7%	30.3%	29.5%	24.9%	23.9%	24.0%	24.0%	24.3%	24.4%
Total Current Liabilities	40.0%	36.5%	26.7%	30.3%	29.5%	24.9%	23.9%	24.0%	24.0%	24.3%	24.4%
Long Term Debt	0.0%	0.0%	21.2%	35.0%	32.4%	30.5%	27.7%	24.1%	21.0%	18.1%	15.4%
Additional debt due to currency rate	0.0%	0.0%	0.0%	14.9%	15.2%	13.7%	13.3%	12.2%	11.1%	9.9%	8.7%
Other Funds	56.5%	37.0%	40.7%	22.6%	15.1%	13.5%	13.0%	13.1%	13.3%	13.5%	13.8%
Total Long Term Liabilities	56.5%	37.0%	61.8%	72.5%	62.7%	57.7%	53.9%	49.4%	45.4%	41.6%	37.9%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	30.6%	32.3%	21.8%	20.0%	21.1%	22.2%	23.9%	25.5%	26.9%	28.0%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	3.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	−4.4%	−20.8%	−24.7%	−12.0%	−3.8%	0.0%	2.7%	5.0%	7.3%	9.6%
Net Equity	3.5%	26.5%	11.5%	−2.8%	7.8%	17.4%	22.2%	26.6%	30.5%	34.2%	37.6%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	241,855	5,094,379	13,328,292	32,248,332	67,755,031	87,658,848	108,215,894	120,800,437	132,830,746	146,336,739	160,659,627
Current liabilities	203,587	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Working capital	38,268	2,472,637	5,973,299	8,593,294	23,391,784	40,964,579	58,787,847	68,658,157	78,293,972	88,794,020	100,144,946
Change in working capital		2,434,369	3,500,662	2,619,994	14,798,490	17,572,795	17,823,269	9,870,309	9,635,816	10,500,047	11,350,926
Current ratio	1.19	1.94	1.81	1.36	1.53	1.88	2.19	2.32	2.44	2.54	2.65
Capitalization Table:											
Debt	287,441	2,653,566	17,054,745	56,497,837	94,294,971	108,344,651	111,547,378	107,476,631	103,113,750	99,596,161	93,908,575
Equity	17,807	1,898,869	3,176,026	(2,183,359)	11,725,984	32,638,683	45,866,860	57,870,944	69,304,738	81,694,392	93,124,269
Percent debt	94.2%	58.3%	84.3%	104.0%	88.9%	76.8%	70.9%	65.0%	59.8%	54.9%	50.2%
Percent equity	5.8%	41.7%	15.7%	−4.0%	11.1%	23.2%	29.1%	35.0%	40.2%	45.1%	49.8%
Times Interest Earned:											
Net income	63,322	(316,634)	(5,432,272)	(13,480,005)	805,775	11,365,903	14,122,108	11,829,702	10,956,198	11,962,464	12,848,286
Add back: interest expense	0	0	292,039	1,657,740	3,805,544	5,304,539	5,729,390	5,490,666	5,013,216	4,535,767	4,058,318
depreciation	0	384,878	1,871,141	3,843,091	5,935,853	7,120,443	7,559,487	8,026,205	8,520,597	9,046,403	9,604,371
taxes	57,402	983,708	2,936,480	26,052,865	43,270,536	38,416,687	39,068,929	40,017,690	40,456,225	41,437,591	42,375,959
total	130,724	1,051,953	(332,613)	18,073,691	53,817,708	62,207,571	66,479,914	65,364,263	64,946,237	66,982,226	68,886,930
Interest	0	0	292,039	1,657,740	3,805,544	5,304,539	5,729,390	5,490,666	5,013,216	4,535,767	4,058,318
Time interest earned			−1.1	10.9	14.1	11.7	11.6	11.9	13.0	14.8	17.0
Operating revenue	3,597,549	35,794,830	101,510,485	331,760,717	629,026,577	662,448,336	699,838,811	736,953,125	769,680,019	811,239,785	852,334,542
Operating expenses (B4 depr, tax)	2,678,553	33,649,537	97,436,385	298,499,916	551,465,865	581,591,161	615,704,531	649,662,090	679,855,600	717,488,248	754,804,344
Operating margin	918,996	2,145,293	4,074,100	33,260,800	77,560,712	80,857,175	84,134,280	87,291,035	89,824,420	93,751,536	97,530,198
Percent	25.5%	6.0%	4.0%	10.0%	12.3%	12.2%	12.0%	11.8%	11.7%	11.6%	11.4%
Net income to total revenue	1.8%	−0.9%	−5.3%	−4.1%	0.1%	1.7%	2.0%	1.6%	1.4%	1.5%	1.5%
Return on total assets	12.4%	−4.4%	−19.7%	−17.3%	0.5%	6.1%	6.8%	5.4%	4.8%	5.0%	5.2%
Return on beginning equity		−1778.1%	−266.1%	−424.4%	−36.9%	96.9%	43.3%	25.8%	18.9%	17.3%	15.8%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Accum. Deprec. / Assets	78.7%	82.0%	74.6%	60.3%	53.6%	53.2%	56.5%	59.8%	63.2%	66.5%	69.8%
Receivables / Sales	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case – VL – 2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		3,127,935	4,526,018	7,117,739	20,430,560	18,105,565	18,614,246	10,650,567	10,310,149	11,339,801	12,174,134
Accounts receivable		1,605,394	3,276,659	11,480,546	14,822,023	1,666,448	1,864,333	1,850,563	1,631,801	2,072,219	2,049,033
Materials & equipment		106,576	385,580	287,691	227,213	117,849	70,160	74,582	79,004	84,024	89,164
Other assets		12,619	45,655	34,064	26,903	13,954	8,307	8,831	9,355	9,949	10,558
Net fixed assets		1,812,818	12,177,675	31,463,710	36,907,987	17,389,585	(1,392,364)	(1,937,072)	(2,564,802)	(3,237,982)	(3,998,636)
		6,665,342	20,411,587	50,383,750	72,414,686	37,293,401	19,164,682	10,647,471	9,465,507	10,268,011	10,324,253
Credits:											
Accounts payable		2,418,155	4,733,251	16,300,046	20,708,208	2,331,022	2,733,777	2,714,234	2,394,493	3,005,946	2,971,962
Long term debt		0	5,840,777	21,473,236	21,482,859	8,497,030	0	(4,774,492)	(4,774,492)	(4,774,492)	(4,774,492)
Currency fluctuation on L/T debt			0	11,582,722	11,269,847	2,936,235	1,645,084	(952,080)	(1,342,396)	(1,618,554)	(1,882,654)
Other funds		2,366,125	8,560,403	5,387,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Equity/retained earnings		1,881,062	1,277,157	(5,359,385)	13,909,343	20,912,699	13,228,177	12,003,984	11,433,894	11,789,654	12,029,877
		6,665,342	20,411,588	50,383,751	72,414,685	37,293,402	19,164,681	10,647,471	9,465,506	10,268,011	10,324,253
check: net change debits and credits		0	1	1	(1)	1	(1)	0	(1)	0	0
Does balance sheet balance?		(0)	(1)	0	0	(1)	(1)	(1)	(2)	(2)	(1)
check: analysis of change in fixed assets		(0)	(0)	(0)	(0)	(0)	0	0	0	(0)	0
check: analysis of change in equity/RE		(0)	0	0	(0)	(0)	0	(0)	(0)	0	(0)
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	(0)	(0)	0	(0)	0	(0)	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		10,295,611	37,248,492	31,972,330	33,042,587	20,574,470	13,171,324	14,001,543	14,831,763	15,774,175	16,739,025
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,851,710)	(19,939,019)	(11,027,674)	(7,004,201)	(7,912,410)	(8,875,968)	(9,965,753)	(11,133,291)
Current depreciation		(384,878)	(1,871,141)	(3,843,091)	(5,935,853)	(7,120,443)	(7,559,487)	(8,026,205)	(8,520,597)	(9,046,403)	(9,604,371)
New capital expenditures, net		0	7,339,387	27,186,182	29,740,272	14,963,232	0	0	0	0	0
		1,812,818	12,177,675	31,463,710	36,907,987	17,389,585	(1,392,364)	(1,937,072)	(2,564,802)	(3,237,982)	(3,998,636)
Analysis of change in net equity/RE											
Net income		(316,634)	(5,432,272)	(13,480,005)	805,775	11,365,903	14,122,108	11,829,702	10,956,198	11,962,464	12,848,286
Revaluation surplus (direct cr. to equity)		10,295,611	37,248,492	31,972,330	33,042,587	20,574,470	13,171,324	14,001,543	14,831,763	15,774,175	16,739,025
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,851,710)	(19,939,019)	(11,027,674)	(7,004,201)	(7,912,410)	(8,875,968)	(9,965,753)	(11,133,291)
Dividends declared		0	0	0	0	0	(7,061,054)	(5,914,851)	(5,478,099)	(5,981,232)	(6,424,143)
		1,881,062	1,277,157	(5,359,385)	13,909,343	20,912,699	13,228,177	12,003,984	11,433,894	11,789,654	12,029,877
Analysis of change in long term debt:											
New debt issued		0	5,840,777	21,473,236	21,482,859	8,497,030	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(4,774,492)	(4,774,492)	(4,774,492)	(4,774,492)
		0	5,840,777	21,473,236	21,482,859	8,497,030	0	(4,774,492)	(4,774,492)	(4,774,492)	(4,774,492)

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INCOME STATEMENT
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		462,647	2,754,406	16,210,454	39,325,208	39,399,775	39,345,196	39,277,314	39,195,101	39,894,382	40,595,623
Natural Gas, Other		35,322,305	98,714,334	315,484,742	589,617,070	622,954,522	660,393,778	697,569,809	730,372,388	771,225,928	811,612,076
Natural Gas, Total		35,784,952	101,468,740	331,695,196	628,942,278	662,354,297	699,738,974	736,847,124	769,567,489	811,120,310	852,207,698
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,597,549	35,794,830	101,510,485	331,760,717	629,026,577	662,448,336	699,838,811	736,953,125	769,680,019	811,239,785	852,334,542
Other Revenues	4,020	33,091	139,844	219,495	282,402	315,030	334,455	355,104	376,977	400,240	424,926
TOTAL OPERATING INCOME	**3,601,569**	**35,827,921**	**101,650,329**	**331,980,212**	**629,308,979**	**662,763,366**	**700,173,266**	**737,308,228**	**770,056,996**	**811,640,025**	**852,759,468**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		168,235	991,586	5,835,763	14,157,075	14,183,919	14,164,271	14,139,833	14,110,236	14,361,978	14,614,424
Natural Gas, Other		31,318,318	87,304,029	278,317,081	518,849,886	546,815,636	579,678,983	612,311,277	641,104,651	676,964,981	712,415,044
Natural Gas, Total		31,486,553	88,295,615	284,152,844	533,006,961	560,999,555	593,843,254	626,451,110	655,214,888	691,326,959	727,029,468
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,447,017	31,512,069	88,403,445	284,322,090	533,224,712	561,242,465	594,101,142	626,724,920	655,505,563	691,635,572	727,357,116
Payroll (Wages & Bonus)	123,610	1,141,129	4,822,411	7,569,108	9,738,394	10,863,547	11,533,390	12,245,455	12,999,741	13,801,955	14,653,237
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	107,926	996,339	4,210,529	6,608,718	8,502,758	9,485,149	10,070,000	10,691,715	11,350,206	12,050,722	12,793,991
TOTAL OPERATING EXPENSES	**2,678,553**	**33,649,537**	**97,436,385**	**298,499,916**	**551,465,865**	**581,591,161**	**615,704,531**	**649,662,090**	**679,855,600**	**717,488,248**	**754,804,344**
EARNINGS BEFORE TAXES, SUSBSIDIES AND DEPRECIATION	**923,016**	**2,178,385**	**4,213,944**	**33,480,296**	**77,843,114**	**81,172,205**	**84,468,735**	**87,646,139**	**90,201,397**	**94,151,777**	**97,955,125**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON-OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON-OPERATING INCOME	**0**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		384,878	2,101,165	4,953,467	8,895,499	11,544,144	12,255,952	13,012,627	13,814,169	14,666,641	15,571,256
Value Added Tax (on Sales)	792,292	713,794	2,184,507	7,906,438	15,966,977	16,867,645	17,622,945	18,371,367	19,029,076	19,934,035	20,829,571
Net Value Added Tax (on Projects)		0	2,727,752	8,186,715	8,485,713	(2,634,458)	(12,039,082)	(4,726,640)	0	0	0
Gas Pehabilitation Fund		428,276	1,310,704	4,743,863	9,580,186	10,120,587	10,573,767	11,022,820	11,417,446	11,960,421	12,497,743
TOTAL DEDUCTIONS	**792,292**	**1,526,948**	**8,324,128**	**25,790,482**	**42,928,376**	**35,897,919**	**28,413,582**	**37,680,175**	**44,260,691**	**46,561,098**	**48,898,569**
NET INCOME BEFORE INTEREST and TAXES	**130,724**	**667,075**	**(4,044,099)**	**7,793,538**	**35,048,190**	**45,423,157**	**56,213,203**	**50,133,772**	**46,118,851**	**47,779,017**	**49,257,359**
INTEREST and TAXES											
Interest Expenses		0	601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
Currency fluctuation loss on debt			0	21,327,447	23,380,492	6,582,035	3,687,716	3,262,413	2,864,949	2,676,204	2,457,220
Taxes:											
Corporate Income Tax	41,816	697,083	1,348,462	10,713,695	24,909,796	25,975,106	27,029,995	28,046,764	28,864,447	30,128,569	31,345,640
Excess Payroll Tax	25,586	222,520	940,370	1,475,976	1,898,987	2,118,392	2,249,011	2,387,864	2,534,949	2,691,381	2,857,381
Property Tax		46,974	303,181	500,921	1,242,666	2,170,216	2,545,730	2,915,503	2,982,158	3,004,033	3,042,368
Road Tax		17,131	52,428	189,755	383,207	404,823	422,951	440,913	456,698	478,417	499,910
TOTAL INTEREST and TAXES	**67,402**	**983,708**	**3,245,799**	**37,323,836**	**59,391,549**	**48,733,955**	**48,878,738**	**49,361,652**	**48,941,118**	**49,146,243**	**49,299,881**
NET INCOME	**63,322**	**(316,634)**	**(7,289,898)**	**(29,530,298)**	**(24,343,359)**	**(3,310,798)**	**7,334,466**	**772,120**	**(2,822,267)**	**(1,366,426)**	**(42,522)**
Memo: Weighted Ave Cost of Gas		8,901	26,037	84,443	155,132	160,691	166,163	171,953	178,056	184,127	190,382
Memo: Weighted Ave Sales Price of Gas		10,219	30,132	99,034	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,227	3,912	14,195	27,988	29,032	29,631	30,302	31,076	31,906	32,780
Memo: Cash Flow From Natural Gas		4,298,399	13,173,125	47,542,351	95,935,317	101,354,742	105,895,721	110,396,013	114,352,601	119,793,351	125,178,230
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule

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BALANCE SHEET
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	47,997	443,093	2,315,606	1,595,770	0	0	4,921,438	5,197,928	5,490,812	5,802,307	6,132,855
Short – Term Investments	0	2,732,839	3,044,398	0	(4,525,987)	(7,988,711)	9,049,373	12,313,945	12,272,639	14,178,857	17,800,074
Cash & Short Term Investments	**47,997**	3,175,932	5,360,004	1,595,770	(4,525,987)	(7,988,711)	13,970,810	17,511,873	17 763,451	19,981,164	23,932,929
Accounts receivable – Gross *(See Note C.)*	**179,378**	1,784,772	5,061,431	16,541,977	31,364,001	33,030,449	34,894,782	36,745,345	38,377,146	40,449,364	42,498,397
Materials & equipment	**12,947**	119,523	505,103	792,794	1,020,006	1,137,856	1,208,016	1,282,598	1,361,602	1,445,627	1,534,791
Other assets	**1,533**	14,152	59,807	93,871	120,775	134,729	143,036	151,867	161,222	171,171	181,728
Total Current Assets	241,855	5,094,379	10,986,346	19,024,413	27,978,795	26,314,322	50,216,644	55,691,682	57,663,421	62,047,325	68,147,844
Fixed assets											
Adusted Cost of Fixed Assets	1,250,729	11,546,340	63,034,950	148,604,006	266,864,967	346,324,326	367,678,567	390,378,817	414,425,075	439,999,235	467,137,675
Less: Accumulated Depreciation	983,749	9,466,542	42,106,770	71,042,962	100,299,183	123,431,579	143,298,387	165,158,170	189,145,626	215,484,439	244,346,426
Net Revalued Assets	266,980	2,079,798	20,928,179	77,561,044	166,565,784	222,892,646	224,380,180	225,220,647	225,279,449	224,514,796	222,791,249
TOTAL ASSETS	**508,835**	**7,174,177**	**31,914,525**	**96,585,457**	**194,544,579**	**249,206,968**	**274,596,823**	**280,912,329**	**282,942,870**	**286,562,122**	**290,939,093**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**203,587**	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54 536,773	57,542,719	60,514,681
Total Current Liabilities	203,587	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Long Term Debt		0	12,027,163	50,293,718	101,234,284	128,433,345	128,433,345	117,730,567	107,027,788	96,325,009	85,622,230
Additional debt due to currency rate			0	21,327,447	44,707,933	51,289,973	54,977,690	53,386,761	50,920,876	47,835,942	44,158,984
Other Funds	**287,441**	2,653,566	11,213,968	17,601,101	22,645,529	25,261,944	26,819,587	28,475,412	30,229,419	32,094,876	34,074,436
Total Long Term Liabilities	287,441	2,653,566	23,241,131	89,222,266	168,587,751	204,985,263	210,230,623	199,592,740	188,178,084	176,255,827	163,855,650
Other Liabilities & Equity											
Net Revaluation Surplus		2,197,696	8,907,124	20,827,174	43,055,961	62,300,613	76,044,099	89,897,194	103,770,165	117,672,153	131,519,862
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807
Retained Earnings	0	(316,634)	(7,606,532)	(37,136,830)	(61,480,188)	(64,790,986)	(61,123,753)	(60,737,694)	(63,559,961)	(64,926,387)	(64,968,906)
Net Equity	17,807	1,898,869	1,318,400	(16,291,849)	(18,406,420)	(2,472,566)	14,936,152	29,177,307	40,228,011	52,763,573	66,568,761
TOTAL LIABILITIES & EQUITY	**508,835**	**7,174,177**	**31,914,523**	**96,585,455**	**194,544,578**	**249,206,966**	**274,596,821**	**280,912,328**	**282,942,867**	**286,562,119**	**290,939,092**

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		(316,634)	(7,289,898)	(29,530,298)	(24,343,359)	(3,310,798)	7,334,466	772,120	(2,822,267)	(1,366,426)	(42,522)
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		384,878	2,101,165	4,953,467	8,895,499	11,544,144	12,255,952	13,012,627	13,814,169	14,666,641	15,571,256
Currency fluctuation loss on L/T debt			0	21,327,447	23,380,492	6,582,035	3,687,716	3,262,413	2,864,949	2,676,204	2,457,220
Changes in assets and liabilities:											
Accounts receivable		(1,605,394)	(3,276,659)	(11,480,546)	(14,822,023)	(1,666,448)	(1,864,333)	(1,850,563)	(1,631,801)	(2,072,219)	(2,049,033)
Materials and supplies		(106,576)	(385,580)	(287,691)	(227,213)	(117,849)	(70,160)	(74,582)	(79,004)	(84,024)	(89,164)
Other assets		(12,619)	(45,655)	(34,064)	(26,903)	(13,954)	(8,307)	(8,831)	(9,355)	(9,949)	(10,558)
Accounts payable		2,418,155	4,733,251	16,300,046	20,708,208	2,331,022	2,733,777	2,714,234	2,394,493	3,005,946	2,971,962
Other funds		2,366,125	8,560,403	6,367,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Net cash provided by operations		**3,127,935**	**4,397,027**	**7,635,492**	**18,609,129**	**17,964,568**	**25,626,754**	**19,483,243**	**16,285,191**	**18,681,630**	**20,788,721**
Cash flows from investing activities:											
Note: Does not include internally-funded routine capital expenditures.											
Capital expenditures – Domestic		0	(2,212,955)	(11,399,726)	(24,730,866)	(21,427,292)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(12,027,163)	(38,266,556)	(50,940,565)	(27,199,062)	0	0	0	0	0
Net cash used in investing activities		**0**	**(14,240,118)**	**(49,666,282)**	**(75,671,452)**	**(48,626,354)**	**0**	**0**	**0**	**0**	**0**
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
Loss on Currency Fluctuation		0	0	0	0	0	0	(4,853,342)	(5,330,833)	(5,761,139)	(6,134,178)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(3,667,233)	(386,060)	0	0	0
Net cash provided (used in) financing activities		**0**	**12,027,163**	**38,266,556**	**50,940,565**	**27,199,062**	**(3,667,233)**	**(15,942,180)**	**(16,033,612)**	**(16,463,917)**	**(16,836,957)**
Net increase (decrease) in cash and cash equivalents		3,127,935	2,184,072	(3,764,234)	(6,121,757)	(3,452,724)	21,959,521	3,541,063	251,578	2,217,713	3,951,765
Cash and cash equivalents – beginning		47,997	3,175,932	5,360,004	1,595,770	(4,525,987)	(7,988,711)	13,970,810	17,511,873	17,763,451	19,981,164
Cash and cash equivalents – ending		3,175,932	5,360,004	1,595,770	(4,525,987)	(7,988,711)	13,970,810	17,511,873	17,763,451	19,981,164	23,932,929

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	1,248,789	1,250,729	11,546,340	63,034,950	148,604,006	266,864,967	346,324,326	367,678,567	390,378,817	414,425,075	439,999,235
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,248,789	11,546,340	48,794,832	98,937,724	191,193,516	297,697,972	367,678,567	390,378,817	414,425,075	439,999,235	467,137,675
New Investments (Current Year)	0	0	14,240,118	49,666,282	75,671,452	48,626,354	0	0	0	0	0
Capitalized Costs	1,542										
Work in Progress	398										
Ending Value of Assets (Gross)	1,250,729	11,546,340	63,034,950	148,604,006	266,864,967	346,324,326	367,678,567	390,378,817	414,425,075	439,999,235	467,137,675
Accumulated Depreciation		983,749	9,466,542	42,106,770	71,042,962	100,299,183	123,431,679	143,298,387	165,158,170	189,145,626	215,484,439
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	983,749	9,081,664	40,005,605	66,089,495	91,403,684	111,887,535	131,042,435	152,145,542	175,331,457	200,817,798	228,775,170
Current Depreciation		384,878	2,101,[illegible]5	4,953,467	8,895,499	11,544,144	12,255,952	13,012,627	13,814,169	14,666,641	15,571,256
Net Value of Assets	266,980	2,073,798	20,928,179	77,561,044	166,565,784	222,892,648	224,380,180	225,220,647	225,279,449	224,514,796	222,791,249
Accum. Revaluation Surplus		10,255,611	47,544,102	93,446,877	126,036,336	156,869,391	178,223,632	200,923,882	224,970,140	250,544,300	277,682,740
Accum. Reevaluated Depreciation		8,097,915	38,636,978	62,619,703	82,980,426	94,568,777	102,179,533	111,026,688	121,199,976	132,872,147	146,162,878
Net Reevaluation Surplus		2,197,696	8,907,124	20,827,174	43,055,901	62,300,613	76,044,099	89,897,194	103,770,165	117,672,153	131,519,862

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	239,706	233,660	227,355	220,893	214,325	207,670	200,952	194,197	187,418	184,668	181,911
Other	3,446,800	3,303,620	3,163,797	3,144,133	3,221,506	3,283,495	3,372,901	3,448,962	3,492,399	3,569,945	3,636,874
Total	3,686,506	3,537,280	3,391,152	3,365,028	3,435,831	3,491,165	3,573,853	3,643,159	3,679,817	3,754,613	3,818,785
Losses (%)											
Residential	1.0%	1.0%									
Other	1.0%	1.0%	0.8%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	237,309	231,323	227,355	220,893	214,325	207,670	200,952	194,197	187,418	184,668	181,911
Other	3,412,332	3,270,584	3,140,069	3,128,412	3,213,452	3,283,495	3,372,901	3,448,962	3,492,399	3,569,945	3,636,874
Total	3,649,641	3,501,907	3,367,424	3,349,305	3,427,777	3,491,165	3,573,853	3,643,159	3,679,817	3,754,613	3,818,785
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,503	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,980	5,118	5,255	5,401	5,558
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		−15.2%	−34.8%	−38.1%	−14.6%	−1.5%	3.3%	0.3%	−1.3%	−0.6%	−0.0%
Average over Period 1998–2002							0.3%				
External Financing		0.0%	88.2%	81.9%	75.3%	70.7%	70.7%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993–US$ x 000)			380.00	1954.00	3989.00	3494.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			385	2,024	4,264	3,864	0	0	0	0	0
Duties on Foreign Suppliers			601,358	1,913,328	2,547,028	1,359,953	0	0	0	0	0
Domestic Supplier (Current–Rubles x 000)			1,611,597	9,486,399	22,183,858	20,067,339	0	0	0	0	0
Foreign Supplier (1993–US$ x 000)			4524.00	9992.00	10348.00	5080.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			4,578	10,352	11,062	5,618	0	0	0	0	0
Foreign Supplier (Current–Rubles x 000)			12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		68,244	(5,188,733)	(24,576,831)	(15,447,860)	8,233,346	19,590,418	13,784,747	10,991,902	13,300,215	15,528,734
Less Retirements			0	0	0	0	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
Less Domestic Suppliers		0	(2,212,955)	(11,399,726)	(24,730,886)	(21,427,292)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(3,667,233)	(386,060)	0	0	0
Funds Available/(Required)		68,244	(7,401,688)	(35,976,558)	(40,178,746)	(13,193,946)	15,923,185	2,695,908	289,123	2,597,437	4,825,956
External Sources (Foreign Projects)		0	12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Accumulative Long–Term Debt			12,027,163	50,293,718	101,234,284	128,433,345	128,433,345	117,730,567	107,027,788	96,325,009	85,622,230
Retirements								10,702,779	10,702,779	10,702,779	10,702,779
Interest			601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
Memo: Total Project		0	13,638,760	61,391,714	134,516,138	181,782,539	181,782,539	181,782,539	181,782,539	181,782,539	181,782,539
Memo: % Externally Financed		0.0%	88.2%	81.9%	75.3%	70.7%	70.7%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(316,634)	(7,606,532)	(37,136,830)	(61,480,188)	(64,790,986)	(61,123,753)	(60,737,694)	(63,559,961)	(64,926,387)
adjusted net income		(316,634)	(7,289,898)	(29,530,298)	(24,343,359)	(3,310,798)	7,334,466	772,120	(2,822,267)	(1,366,426)	(42,522)
less: dividends		0	0	0	0	0	(3,667,233)	(386,060)	0	0	0
Ending retained earnings – to B/S		(316,634)	(7,606,532)	(37,136,830)	(61,480,188)	(64,790,986)	(61,123,753)	(60,737,694)	(63,559,961)	(64,926,387)	(64,968,908)

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			13,638,760								
VAT Payment			2,727,752								
VAT Recapture				(1,363,876)	(1,363,876)						
1995 Investment				47,752,955							
VAT Payment				9,550,591							
VAT Recapture					(4,775,295)	(4,775,295)					
1995 Investment					73,124,423						
VAT Payment					14,624,885						
VAT Recapture						(7,312,442)	(7,312,442)				
1996 Investment						47,266,401					
VAT Payment						9,453,280					
VAT Recapture							(4,726,640)	(4,726,640)			
Value Added Tax on Projects		0	2,727,752	9,550,591	14,624,885	9,453,280	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,363,876)	(6,139,171)	(12,087,738)	(12,039,082)	(4,726,640)	0	0	0
Net V.A.T. on Projects		0	2,727,752	8,186,715	8,485,713	(2,634,458)	(12,039,082)	(4,726,640)	0	0	0
On Sales											
(a) GAS & LPG Purchases		31,512,069	88,433,445	284,322,090	533,224,712	561,242,465	594,101,142	626,724,920	655,505,563	691,635,572	727,357,116
(b) Commodity = = Purchases / (1+VAT Rate)		26,260,057	73,694,537	236,935,075	444,353,927	467,702,054	495,084,285	522,270,766	546,254,636	576,362,977	606,130,930
(c) VAT Included = Line (b) – Line (b)		5,252,011	14,733,907	47,387,015	88,870,785	93,540,411	99,016,857	104,454,153	109,250,927	115,272,595	121,226,186
(d) GAS & LPG Sales		35,794,830	101,510,485	331,760,717	629,026,577	662,448,336	699,838,811	736,953,125	769,680,019	811,239,785	852,334,542
(e) Commodity = = Purchases / (1+VAT Rate)		29,829,025	84,592,070	276,467,264	524,188,814	552,040,280	583,199,010	614,127,604	641,400,016	676,033,154	710,278,785
(f) VAT Included = Line (d) – Line (e)		5,965,805	16,918,414	55,293,453	104,837,763	110,408,056	116,639,802	122,825,521	128,280,003	135,206,631	142,055,757
(g) Utility's VAT Liability = Line (f) – Line (c)		713,794	2,184,507	7,906,438	15,966,977	16,867,645	17,622,945	18,371,367	19,029,076	19,934,035	20,829,571
Test											
Margin on GAS & LPG Sales		4,282,761	13,107,040	47,438,626	95,801,865	101,205,871	105,737,670	110,228,205	114,174,456	119,604,213	124,977,426
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			50,293,718	101,234,284	128,433,345	128,433,345	117,730,567	107,027,788	96,325,009	85,622,230
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			5,701	5,077	1,360	741	637	545	496	442
Additional ruble debt/expense to record – in rubles			21,327,447	23,380,492	6,582,035	3,687,716	3,262,413	2,864,949	2,676,204	2,457,220
cumulative			21,327,447	44,707,939	51,289,973	54,977,690	58,240,103	61,105,052	63,781,256	66,238,476
Computation of payment on additional L/T debt – 1/12th							4,853,342	5,330,833	5,761,139	6,134,178
cumulative							4,853,342	10,184,175	15,945,314	22,079,492

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	9.4%	6.2%	7.3%	1.7%	0.0%	0.0%	1.8%	1.9%	1.9%	2.0%	2.1%
Short – Term Investments	0.0%	38.1%	9.5%	0.0%	−2.3%	−3.2%	3.3%	4.4%	4.3%	4.9%	6.1%
Cash & Investments	9.4%	44.3%	16.8%	1.7%	−2.3%	−3.2%	5.1%	6.2%	6.3%	7.0%	8.2%
Accounts receivable	35.3%	24.9%	15.9%	17.1%	16.1%	13.3%	12.7%	13.1%	13.6%	14.1%	14.6%
Materials & equipment	2.5%	1.7%	1.6%	0.8%	0.5%	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%
Other assets	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total Current Assets	47.5%	71.0%	34.4%	19.7%	14.4%	10.6%	18.3%	19.8%	20.4%	21.7%	23.4%
Fixed assets											
Adusted Cost of Fixed Assets	245.8%	160.9%	197.5%	153.9%	137.2%	139.0%	133.9%	139.0%	146.5%	153.5%	160.6%
Less: Accumulated Depraciation	193.3%	132.0%	131.9%	73.6%	51.6%	49.5%	52.2%	58.8%	66.8%	75.2%	84.0%
Net Revalued Assets	52.5%	29.0%	65.6%	80.3%	85.6%	89.4%	81.7%	80.2%	79.6%	78.3%	76.6%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	40.0%	36.5%	23.0%	24.5%	22.8%	18.7%	18.0%	18.6%	19.3%	20.1%	20.8%
Total Current Liabilities	40.0%	36.5%	23.0%	24.5%	22.8%	18.7%	18.0%	18.6%	19.3%	20.1%	20.8%
Long Term Debt	0.0%	0.0%	37.7%	52.1%	52.0%	51.5%	46.8%	41.9%	37.8%	33.6%	29.4%
Additional debt due to currency rate	0.0%	0.0%	0.0%	22.1%	23.0%	20.6%	20.0%	19.0%	18.0%	16.7%	15.2%
Other Funds	56.5%	37.0%	35.1%	18.2%	11.6%	10.1%	9.8%	10.1%	10.7%	11.2%	11.7%
Total Long Term Liabilities	56.5%	37.0%	72.8%	92.4%	86.7%	82.3%	76.6%	71.1%	66.5%	61.5%	56.3%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	30.6%	27.9%	21.6%	22.1%	25.0%	27.7%	32.0%	36.7%	41.1%	45.2%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	3.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	−4.4%	−23.8%	−38.4%	−31.6%	−26.0%	−22.3%	−21.6%	−22.5%	−22.7%	−22.3%
Net Equity	3.5%	26.5%	4.1%	−16.9%	−9.5%	−1.0%	5.4%	10.4%	14.2%	18.4%	22.9%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	241,855	5,094,379	10,986,346	19,024,413	27,978,795	26,314,322	50,216,644	55,691,682	57,663,421	62,047,325	68,147,844
Current liabilities	203,587	2,621,742	7,354,993	23,655,039	44,363,247	46,694,269	49,428,046	52,142,280	54,536,773	57,542,719	60,514,681
Working capital	38,268	2,472,637	3,631,353	(4,630,626)	(16,384,452)	(20,379,947)	788,598	3,549,402	3,126,648	4,504,607	7,633,163
Change in working capital		2,434,369	1,158,716	(8,261,979)	(11,753,826)	(3,995,495)	21,168,544	2,760,804	(422,754)	1,377,959	3,128,557
Current ratio	1.19	1.94	1.49	0.80	0.63	0.56	1.02	1.07	1.06	1.08	1.13
Capitalization Table.											
Debt	287,441	2,653,566	23,241,131	89,222,266	168,587,751	204,985,263	210,230,623	199,592,740	188,178,084	176,255,827	163,855,650
Equity	17,807	1,898,869	1,318,400	(16,291,849)	(18,406,420)	(2,472,566)	14,938,152	29,177,307	40,228,011	52,763,573	66,568,761
Percent debt	94.2%	58.3%	94.5%	122.3%	112.3%	101.2%	93.4%	87.2%	82.4%	77.0%	71.1%
Percent equity	5.8%	41.7%	5.4%	−22.3%	−12.3%	−1.2%	6.6%	12.8%	17.6%	23.0%	28.9%
Times Interest Earned:											
Net income	63,322	(316,634)	(7,289,898)	(29,530,298)	(24,343,359)	(3,310,798)	7,334,466	772,120	(2,822,267)	(1,366,426)	(42,522)
Add back: interest expense	0	0	601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
depreciation	0	384,878	2,101,165	4,953,467	8,895,499	11,544,144	12,255,952	13,012,627	13,814,169	14,666,641	15,571,256
taxes	67,402	983,708	3,245,799	37,323,836	59,391,549	48,733,955	48,878,738	49,361,652	48,941,118	49,146,243	49,299,881
total	130,724	1,051,953	(1,341,576)	15,863,049	51,520,089	68,450,683	81,312,490	75,454,595	71,170,938	72,614,098	73,925,977
Interest	0	0	601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
Time interest earned			−2.2	5.1	6.8	6.0	6.3	6.1	6.3	7.1	8.1
Operating revenue	3,597,549	35,794,830	101,510,485	331,760,717	629,026,577	662,448,336	699,838,011	736,953,125	769,680,019	811,239,785	852,334,542
Operating expenses (B4 depr, tax)	2,678,553	33,649,537	97,436,385	298,499,916	551,455,865	581,591,161	615,704,531	649,662,090	679,855,600	717,488,248	754,804,344
Operating margin	918,996	2,145,293	4,074,100	33,260,800	77,560,712	80,857,175	84,134,280	87,291,035	89,824,420	93,751,536	97,530,196
Percent	25.5%	6.0%	4.0%	10.0%	12.3%	12.2%	12.0%	11.8%	11.7%	11.6%	11.4%
Net income to total revenue	1.8%	−0.9%	−7.2%	−8.9%	−3.9%	−0.5%	1.0%	0.1%	−0.4%	−0.2%	−0.0%
Return on total assets	12.4%	−4.4%	−22.8%	−30.6%	−12.5%	−1.3%	2.7%	0.3%	−1.0%	−0.5%	−0.0%
Return on beginning equity		−1778.1%	−383.9%	−2239.9%	149.4%	18.0%	−296.6%	5.2%	−9.7%	−3.4%	−0.1%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%
Accum. Deprec / Assets	78.7%	82.0%	66.8%	47.8%	37.6%	35.6%	39.0%	42.3%	45.6%	49.0%	52.3%
Receivables / Sales	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Worksheet for Cash Flow Statement:	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Debits											
Cash and investments		3,127,935	2,184,072	(3,764,234)	(6,121,757)	(3,462,724)	21,959,522	3,541,062	251,579	2,217,712	3,951,765
Accounts receivable		1,605,394	3,276,659	11,480,546	14,822,023	1,666,448	1,864,333	1,850,563	1,631,801	2,072,219	2,049,033
Materials & equipment		106,576	385,580	287,691	227,213	117,849	70,160	74,582	79,004	84,024	89,164
Other assets		12,619	45,655	34,064	26,903	13,954	8,307	8,831	9,355	9,949	10,558
Net fixed assets		1,812,818	18,848,381	56,632,865	89,004,740	56,326,862	1,487,533	840,468	58,801	(764,653)	(1,723,547)
		6,665,342	24,740,347	64,670,932	97,959,122	54,662,389	25,389,855	6,315,506	2,030,540	3,619,251	4,376,973
Credits:											
Accounts payable		2,418,155	4,733,251	16,300,046	20,708,208	2,331,022	2,733,777	2,714,234	2,394,493	3,005,946	2,971,962
Long term debt		0	12,027,163	38,266,556	50,940,565	27,199,062	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
Currency fluctuation on L/T debt			0	21,327,447	23,380,492	6,582,035	3,687,716	(1,590,929)	(2,465,885)	(3,084,935)	(3,676,958)
Other funds		2,366,125	8,560,403	6,387,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Equity/retained earnings		1,881,062	(580,469)	(17,610,249)	(2,114,572)	15,933,854	17,410,719	14,239,155	11,050,703	12,535,563	13,805,187
		6,665,342	24,740,348	64,670,932	97,959,121	54,662,369	25,389,855	6,315,506	2,030,539	3,619,252	4,376,972
check: net change debits and credits		0	1	0	(1)	0	0	0	(1)	1	(1)
Does balance sheet balance?		(0)	(2)	(1)	(1)	(2)	(2)	(2)	(2)	(3)	(2)
check: analysis of change in fixed assets		(0)	(0)	0	0	(0)	(0)	0	(0)	(0)	0
check: analysis of change in equity/RE		(0)	0	(0)	(0)	(0)	0	0	(0)	0	(0)
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	0	0	(0)	0	0	0
Analysis of change in net fixed assets:											
Revaluation write up of assets		10,295,611	37,248,492	35,902,774	42,589,509	30,833,004	21,354,242	22,700,250	24,046,258	25,574,160	27,138,440
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,982,725)	(20,360,722)	(11,588,352)	(7,610,756)	(8,847,155)	(10,173,288)	(11,672,171)	(13,290,731)
Current depreciation		(384,878)	(2,101,165)	(4,953,467)	(8,895,499)	(11,544,144)	(12,255,952)	(13,012,627)	(13,814,169)	(14,656,641)	(15,571,256)
New capital expenditures, net		0	14,240,118	49,666,282	75,671,452	48,626,354	0	0	0	0	0
		1,812,818	18,848,381	56,632,865	89,004,740	56,326,862	1,487,533	840,468	58,801	(764,653)	(1,723,547)
Analysis of change in net equity/RE											
Net income		(316,634)	(7,289,898)	(29,530,298)	(24,343,359)	(3,310,798)	7,334,468	772,120	(2,822,267)	(1,366,426)	(42,522)
Revaluation surplus (direct cr to equity)		10,295,611	37,248,492	35,902,774	42,589,509	30,833,004	21,354,242	22,700,250	24,046,258	25,574,160	27,138,440
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,982,725)	(20,360,722)	(11,588,352)	(7,610,756)	(8,847,155)	(10,173,288)	(11,672,171)	(13,290,731)
Dividends declared		0	0	0	0	0	(3,667,233)	(386,060)	0	0	0
		1,881,062	(580,469)	(17,610,249)	(2,114,572)	15,933,854	17,410,719	14,239,155	11,050,703	12,535,563	13,805,187
Analysis of change in long term debt:											
New debt issued		0	12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
		0	12,027,163	38,266,556	50,940,565	27,199,062	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)

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INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		462,647	2,754,406	16,857,938	42,469,390	44,131,657	45,656,615	47,169,304	47,089,416	47,722,122	48,344,254
Natural Gas, Other		35,322,305	98,714,334	306,360,254	571,445,038	602,704,437	637,852,798	672,751,907	704,054,589	742,763,148	780,980,190
Natural Gas, Total		35,784,952	101,468,740	323,218,192	613,914,428	646,836,094	683,509,414	719,921,212	751,144,005	790,485,270	829,324,444
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,597,549	35,794,830	101,510,485	323,283,713	613,998,727	646,930,133	683,609,251	720,027,213	751,256,536	790,604,745	829,451,287
Other Revenues	4,020	33,091	139,844	219,495	282,402	315,030	334,455	355,104	376,977	400,240	424,926
TOTAL OPERATING INCOME	**3,601,569**	**35,827,921**	**101,650,329**	**323,503,208**	**614,281,129**	**647,245,163**	**683,943,706**	**720,382,316**	**751,633,513**	**791,004,985**	**829,876,214**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		168,235	991,586	6,068,858	15,288,980	15,887,396	16,436,382	16,980,950	16,952,190	17,179,964	17,403,931
Natural Gas, Other		31,318,318	87,304,029	270,267,560	502,858,903	529,040,562	559,893,012	590,526,674	618,003,473	651,980,986	685,527,056
Natural Gas, Total		31,486,553	88,295,615	276,336,418	518,147,883	544,927,958	576,329,393	607,507,624	634,955,663	669,160,950	702,930,987
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,447,017	31,512,069	88,403,445	276,505,664	518,365,635	545,170,868	576,587,281	607,781,433	635,246,338	669,469,563	703,258,635
Payroll (Wages & Bonus)	123,610	1,141,129	4,822,411	7,569,108	9,738,394	10,863,547	11,533,390	12,245,455	12,999,741	13,801,955	14,653,237
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	107,926	996,339	4,210,529	6,608,718	8,502,758	9,485,149	10,070,000	10,691,715	11,350,296	12,050,722	12,793,991
TOTAL OPERATING EXPENSES	**2,678,553**	**33,649,537**	**97,436,385**	**290,683,490**	**536,606,787**	**565,519,564**	**596,190,671**	**630,718,603**	**659,596,375**	**695,322,239**	**730,705,862**
EARNINGS BEFORE TAXES, SUSBSIDIES AND DEPRECIATION	**923,016**	**2,178,385**	**4,213,944**	**32,819,718**	**77,674,342**	**81,725,599**	**85,753,035**	**89,663,713**	**92,037,138**	**95,682,746**	**99,170,351**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON-OPERATING INCOME											
Subsidies for Losses on LPG	0	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON-OPERATING INCOME	**0**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		384,878	2,101,165	4,953,467	8,895,499	11,544,144	12,255,952	13,012,627	13,814,169	14,666,641	15,571,256
Value Added Tax (on Sales)	792,292	713,794	2,184,507	7,796,341	15,938,849	16,959,877	17,836,995	18,707,630	19,335,033	20,189,197	21,032,109
Net Value Added Tax (on Projects)		0	2,727,752	8,186,715	8,485,713	(2,634,458)	(12,039,082)	(4,726,640)	0	0	0
Gas Rehabilitation Fund		428,276	1,310,704	4,677,805	9,563,309	10,175,926	10,702,197	11,224,578	11,601,020	12,113,518	12,619,265
TOTAL DEDUCTIONS	**792,292**	**1,526,948**	**8,324,128**	**25,614,328**	**42,883,370**	**36,045,491**	**28,756,062**	**38,218,195**	**44,750,222**	**46,969,356**	**49,222,630**
NET INCOME BEFORE INTEREST and TAXES	**130,724**	**667,075**	**(4,044,099)**	**7,309,115**	**34,924,424**	**45,828,979**	**57,155,023**	**51,613,327**	**47,465,061**	**48,902,528**	**50,148,526**
INTEREST and TAXES											
Interest Expenses		0	601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
Currency fluctuation loss on debt			0	21,327,447	23,380,492	6,582,035	3,697,716	3,262,413	2,864,949	2,676,204	2,457,220
Taxes:											
Corporate Income Tax	41,816	697,083	1,348,462	10,502,310	24,855,789	26,152,192	27,440,971	28,692,388	29,451,884	30,618,479	31,734,512
Excess Payroll Tax	25,586	222,520	940,370	1,475,976	1,898,987	2,118,392	2,249,011	2,387,864	2,534,949	2,691,381	2,857,381
Property Tax		46,974	303,181	500,921	1,230,820	2,152,773	2,630,646	2,902,014	2,971,864	3,000,663	3,044,003
Road Tax		17,131	52,428	187,112	382,532	407,037	428,088	448,983	464,041	484,541	504,771
TOTAL INTEREST and TAXES	**67,402**	**983,708**	**3,245,799**	**37,109,809**	**59,325,021**	**48,895,809**	**49,279,767**	**50,001,858**	**49,525,605**	**49,638,907**	**49,695,249**
NET INCOME	**63,322**	**(316,634)**	**(7,289,898)**	**(29,800,694)**	**(24,400,597)**	**(3,066,830)**	**7,875,256**	**1,611,468**	**(2,060,543)**	**(736,379)**	**453,276**
Memo: Weighted Ave Cost of Gas		8,901	26,037	84,174	154,501	159,832	165,092	170,673	176,783	182,876	189,151
Memo: Weighted Ave Sales Price of Gas		10,219	30,132	98,915	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,227	3,912	14,347	28,622	29,891	30,702	31,582	32,349	33,157	34,011
Memo: Cash Flow From Natural Gas		4,298,399	13,173,125	46,881,774	95,766,545	101,908,136	107,180,020	112,413,588	116,188,343	121,324,321	126,393,457
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	47,997	443,093	2,315,606	1,097,736	0	0	4,921,438	5,197,928	5,490,812	5,802,307	6,132,855
Short – Term Investments	0	2,732,839	3,044,398	0	(5,340,562)	(8,635,747)	8,588,208	12,188,234	12,873,855	15,361,750	19,203,448
Cash & Short Term Investments	**47,997**	3,175,932	5,360,004	1,097,736	(5,340,562)	(8,635,747)	13,509,646	17,386,162	18,364,668	21,164,057	25,336,302
Accounts receivable – Gross *(See Note C)*	**179,378**	1,784,772	5,061,431	16,119,304	30,614,695	32,256,693	34,085,557	35,901,399	37,458,529	39,420,477	41 357,411
Materials & equipment	**12,947**	119,523	505,103	792,794	1,020,006	1,137,856	1,208,016	1,282,598	1,361,602	1,445,627	1,534,791
Other assets	**1,533**	14,152	59,807	93,871	120,775	134,729	143,036	151,867	161,222	171,171	181,728
Total Current Assets	241,855	5,094,379	10,986,346	18,103,705	26,414,914	24,893,530	48,946,254	54,722,025	57,346,021	62,201,332	68,410,232
Fixed assets											
Adusted Cost of Fixed Assets	1,250,729	11,546,340	63,034,950	148,604,006	266,864,967	346,324,326	367,678,567	390,378,817	414,425,075	439,999,235	467,137,675
Less: Accumulated Depreciation	983,749	9,466,542	42,106,770	71,042,962	100,299,183	123,431,679	143,298,387	165,158,170	189,145,626	215,484,439	244,346,426
Net Revalued Assets	266,980	2,079,798	20,928,179	77,561,044	166,565,784	222,892,646	224,380,180	225,220,647	225,279,449	224,514,796	222 791,249
TOTAL ASSETS	**506,835**	**7,174,177**	**31,914,525**	**95,664,749**	**192,980,698**	**247,786,177**	**273,326,434**	**279,942,673**	**282,625,470**	**286,716,128**	**291,201,481**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**203,587**	2,621,742	7,354,993	23,004,727	43,127,001	45,357,144	47,970,927	50,566,219	52,851,246	55,698,550	58,509,735
Total Current Liabilities	203,587	2,621,742	7,354,993	23,004,727	43,127,001	45,357,144	47,970,927	50,566,219	52,851,246	55,698,550	58,509,735
Long Term Debt		0	12,027,163	50,293,718	101,234,284	128,433,345	128,433,345	117,730,567	107,027,788	96,325,009	85,622,230
Additional debt due to currency rate			0	21,327,447	44,707,939	51,289,973	54,977,690	53,386,761	50,920,876	47,835,942	44,158,984
Other Funds	**287,441**	2,653,566	11,213,968	17,601,101	22,645,529	25,261,944	26,819,587	23,475,412	30,229 419	32,094,876	34,074,436
Total Long Term Liabilities	287,441	2,653,566	23,241,131	89,222,266	168,387,751	204,985,263	210,230,623	199,592,740	188,178,084	176,255,827	163,855,650
Other Liabilities & Equity											
Net Revaluation Surplus		2,197,696	8,907,124	20,827,174	43,055,961	62,300,613	76,044,099	89 897,194	103,770,165	117,672,153	131,519,862
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807
Retained Earnings	0	(316,634)	(7,606,532)	(37,407,225)	(61,807,823)	(64,874,653)	(60,937,025)	(60,131,290)	(62,191,834)	(62,928,213)	(62,701,575)
Net Equity	17,807	1,898,869	1,318,400	(16,562,245)	(18,734,055)	(2,556,233)	15,124,881	29,783,710	41,596,138	54,761,747	68,836,094
TOTAL LIABILITIES & EQUITY	**506,835**	**7,174,177**	**31,914,523**	**95,664,748**	**192,980,697**	**247,786,174**	**273,326,431**	**279,942,670**	**282,625,467**	**286,716,124**	**291,201,479**

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities											
Net income		(316,634)	(7,289,898)	(29,800,694)	(24,400,597)	(3,066,830)	7,875,256	1,511,468	(2,060,543)	(736,379)	453,276
Adjustments to reconcile net income to cash provided by operating activities											
Depreciation		384,878	2,101,165	4,953,467	8,895,499	11,544,144	12,255,952	13,012,627	13,814,169	14,666,641	15,571,256
Currency fluctuation loss on L/T debt			0	21,327 447	23,380,492	6,582,035	3,687,716	3,262,413	2,864,949	2,676,204	2,457,220
Changes in assets and liabilities:											
Accounts receivable		(1,605,394)	(3,276,659)	(11,057,873)	(14,495,391)	(1,641,998)	(1,828,864)	(1,815,842)	(1,557,131)	(1,951,948)	(1,936,934)
Materials and supplies		(106,576)	(385,580)	(287,691)	(227,213)	(117,849)	(70,160)	(74,582)	(79,004)	(84,024)	(89,164)
Other assets		(12,619)	(45,655)	(34,064)	(26,903)	(13,954)	(8,307)	(8,831)	(9,355)	(9,949)	(10,558)
Accounts payable		2,418,155	4,733,251	15,649,735	20,122,274	2,230,143	2,613,784	2,595,292	2,285,026	2,847,305	2,811,184
Other funds		2,366,125	8,560,403	6,387,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Net cash provided by operations		3,127,935	4,397,027	7,137,458	18,292,589	18,132,107	26,083,021	20,238,371	17,012,118	19,263,307	21,235,840
Cash flows from investing activities:											
Note: Does not include internally – funded routine capital expenditures											
Capital expenditures – Domestic		0	(2,212,955)	(11,399,726)	(24,730,866)	(21,427,292)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(12,027,163)	(38,266,556)	(50,940,565)	(27,199,062)	0	0	0	0	0
Net cash used in investing activities		0	(14,240,118)	(49,666,282)	(75,671,452)	(48,626,354)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
Loss on Currency Fluctuation		0	0	0	0	0	0	(4,853,342)	(5,330,833)	(5,761,139)	(6,134,178)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(3,937,628)	(805,734)	0	0	(226,638)
Net cash provided (used in) financing activities		0	12,027,163	38,266,556	50,940,565	27,199,062	(3,937,628)	(16,361,855)	(16,033,612)	(16,463,917)	(17,063,595)
Net increase (decrease) in cash and cash equivalents		3,127,935	2,184,072	(4,262,268)	(6,438,298)	(3,295,185)	22,145,393	3,876,516	978,506	2,799,389	4,172,245
Cash and cash equivalents – beginning		47,997	3,175,932	5,360,004	1,097,736	(5,340,562)	(8,635,747)	13,509,646	17,386,162	18,364,668	21,164,057
Cash and cash equivalents – ending		3,175,932	5,360,004	1,097,736	(5,340,562)	(8,635,747)	13,509,646	17,386,162	18,364,668	21,164,057	25,336,302

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	**1,248,789**	1,250,729	11,546,340	63,034,950	148,604,006	266,864,967	346,324,326	367,678,567	390,378,817	414,425,075	439,999,235
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,248,789	11,546,340	48,794,832	98,937,724	191,193,516	297,607,972	367,678,567	390,378,817	414,425,075	439,999,235	467,137,675
New Investments (Current Year)	**0**	0	14,240,118	49,666,282	75,671,452	48,626,354	0	0	0	0	0
Capitalized Costs	**1,542**										
Work in Progress	**396**										
Ending Value of Assets (Gross)	1,250,729	11,546,340	63,034,950	148,604,006	266,864,967	346,324,326	367,678,567	390,378,817	414,425,075	439,999,235	467,137,675
Accumulated Depreciation		983,749	9,466,542	42,106,770	71,042,962	100,299,183	123,431,679	143,298,387	165,158,170	189,145,626	215,484,439
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	**983,749**	9,081,664	40,005,605	66,089,495	91,403,684	111,687,535	131,042,435	152,145,542	175,331,457	200,817,798	228,775,170
Current Depreciation		384,878	2,101,165	4,953,467	8,895,499	11,544,144	12,255,952	13,012,527	13,814,169	14,666,641	15,571,256
Net Value of Assets	266,980	2,079,798	20,928,179	77,561,044	166,565,784	222,892,646	224,380,180	225,220,647	225,279,449	224,514,796	222,791,249
Accum. Revaluation Surplus		10,295,611	47,544,103	83,445,877	126,036,386	156,869,391	178,223,632	200,923,882	224,970,140	250,544,300	277,682,740
Accum. Reevaluated Depreciation		8,097,915	38,636,978	62,619,703	82,980,426	94,568,777	102,179,533	111,026,688	121,199,976	132,872,147	146,162,878
Net Reevaluation Surplus		2,197,696	8,907,124	20,827,174	43,055,961	62,300,613	76,044,099	89,897,194	103,770,165	117,672,153	131,519,862

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	239,706	233,660	227,355	229,716	231,461	232,611	233,187	233,217	225,166	220,902	216,633
Other	3,446,800	3,303,620	3,163,797	3,053,198	3,122,219	3,176,760	3,257,775	3,326,256	3,366,556	3,438,193	3,499,611
Total	3,686,506	3,537,280	3,391,152	3,282,914	3,353,680	3,409,371	3,490,962	3,559,473	3,591,722	3,659,095	3,716,244
Losses (%)											
Residential	1.0%	1.0%									
Other	1.0%	1.0%	0.8%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	237,309	231,323	227,355	229,715	231,461	232,611	233,187	233,217	225,166	220,902	216,633
Other	3,412,332	3,270,584	3,140,069	3,037,932	3,114,413	3,176,760	3,257,775	3,326,256	3,366,556	3,438,193	3,499,611
Total	3,649,641	3,501,907	3,367,424	3,267,648	3,345,874	3,409,371	3,490,962	3,559,473	3,591,722	3,659,095	3,716,244
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 500 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	62%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,196	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,980	5,118	5,255	5,401	5,558
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		–15.2%	–34.8%	–38.4%	–14.6%	–1.4%	3.5%	0.7%	–0.9%	–0.3%	0.2%
Average over Period 1998–2002							0.6%				
External Financing		0.0%	88.2%	81.9%	75.3%	70.7%	70.7%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993 – US$ x 000)			380.00	1954.00	3989.00	3494.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			385	2,024	4,264	3,864	0	0	0	0	0
Duties on Foreign Suppliers			601,358	1,913,328	2,547,028	1,359,953	0	0	0	0	0
Domestic Supplier (Current – Rubles x 000)			1,611,597	9,486,399	22,183,858	20,067,339	0	0	0	0	0
Foreign Supplier (1993 – US$ x 000)			4524.00	9992.00	10348.00	5080.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			4,578	10,352	11,062	5,618	0	0	0	0	0
Foreign Supplier (Current – Rubles x 000)			12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		68,244	(5,188,733)	(24,847,228)	(15,505,098)	8,477,314	20,131,209	14,624,096	11,753,626	13,930,262	16,024,532
Less Retirements			0	0	0	0	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
Less Domestic Suppliers		0	(2,212,955)	(11,399,726)	(24,730,886)	(21,427,292)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(3,937,628)	(805,734)	0	0	(226,638)
Funds Available/(Required)		68,244	(7,401,688)	(36,246,954)	(40,235,984)	(12,949,978)	16,193,580	3,115,583	1,050,847	3,227,483	5,095,115
External Sources (Foreign Projects)		0	12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Accumulative Long – Term Debt			12,027,163	50,293,718	101,234,284	128,433,345	128,433,345	117,730,567	107,027,788	96,325,009	85,622,230
Retirements								10,702,779	10,702,779	10,702,779	10,702,779
Interest			601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
Memo: Total Project		0	13,638,760	61,391,714	134,516,138	181,782,539	181,782,539	181,782,539	181,782,539	181,782,539	181,782,539
Memo: % Externally Financed		0.0%	88.2%	81.9%	75.3%	70.7%	70.7%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(316,634)	(7,606,532)	(37,407,226)	(61,807,823)	(64,874,653)	(60,937,025)	(60,131,290)	(62,191,834)	(62,928,213)
adjusted net income		(316,634)	(7,289,898)	(29,800,694)	(24,400,597)	(3,066,830)	7,875,250	1,611,468	(2,060,543)	(736,379)	453,276
less: dividends		0	0	0	0	0	(3,937,628)	(805,734)	0	0	(226,638)
Ending retained earnings – to B/S		(316,634)	(7,606,532)	(37,407,226)	(61,807,823)	(64,874,653)	(60,937,025)	(60,131,290)	(62,191,834)	(62,928,213)	(62,701,575)

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			13,638,760								
VAT Payment			2,727,752								
VAT Recapture				(1,363,876)	(1,363,876)						
1995 Investment				47,752,955							
VAT Payment				9,550,591							
VAT Recapture					(4,775,295)	(4,775,295)					
1995 Investment					73,124,423						
VAT Payment					14,624,885						
VAT Recapture						(7,312,442)	(7,312,442)				
1996 Investment						47,266,401					
VAT Payment						9,453,280					
VAT Recapture							(4,726,640)	(4,726,640)			
Value Added Tax on Projects		0	2,727,752	9,550,591	14,624,885	9,453,280	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,363,876)	(6,139,171)	(12,087,738)	(12,039,082)	(4,726,640)	0	0	0
Net V.A.T. on Projects		0	2,727,752	8,186,715	8,485,713	(2,634,458)	(12,039,082)	(4,726,640)	0	0	0
On Sales											
(a) GAS & LPG Purchases		31,512,069	88,403,445	276,505,664	518,365,635	545,170,868	576,587,281	607,781,433	635,246,338	669,469,563	703,258,635
(b) Commodity = = Purchases / (1+VAT Rate)		26,260,057	73,669,537	230,421,387	431,971,362	454,309,057	480,489,401	506,484,528	529,371,948	557,891,302	586,048,862
(c) VAT Included = Line (b) – Line (b)		5,252,011	14,733,907	46,084,277	86,394,272	90,861,811	96,097,880	101,296,906	105,874,390	111,578,260	117,209,772
(d) GAS & LPG Sales		35,794,830	101,510,485	323,283,713	613,998,727	646,930,133	683,609,251	720,027,213	751,256,536	790,604,745	829,451,287
(e) Commodity = = Purchases / (1+VAT Rate)		29,829,025	84,592,070	269,403,094	511,665,606	539,108,444	569,674,376	600,022,677	626,047,113	658,837,287	691,209,406
(f) VAT Included = Line (d) – Line (e)		5,965,805	16 918,414	53,880,619	102,333,121	107,821,689	113,934,875	120,004,535	125,209,423	131,767,457	138,241,881
(g) Utility's VAT Liability = Line (f) – Line (c)		713,794	2,184,507	7,796,341	15,938,849	16,959,877	17,836,995	13,707,630	19,335,033	20,189,197	21,032,109
Test											
Margin on GAS & LPG Sales		4,282,761	13,107,040	46,778,049	95,633,092	101,759,265	107,021,970	112,245,779	116,010,198	121,135,182	126,192,653
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			50,293,718	101,234,284	128,433,345	128,433,345	117,730,567	107,027,788	96,325,009	85,622,230
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			5,701	5,077	1,360	741	637	545	496	442
Additional ruble debt/expense to record – in rubles			21,327,447	23,380,492	6,582,035	3,687,716	3,262,413	2,864,949	2,676,204	2,457,220
cumulative			21,327,447	44,707,939	51,289,973	54,977,690	58,240,103	61,105,052	63,781,256	66,238,476
Computation of payment on additional L/T debt – 1/12th							4,853,342	5,330,833	5,761,139	6,134,178
cumulative							4,853,342	10,184,175	15,945,314	22,079,492

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	9.4%	6.2%	7.3%	1.1%	0.0%	0.0%	1.8%	1.9%	1.9%	2.0%	2.1%
Short – Term Investments	0.0%	38.1%	9.5%	0.0%	−2.8%	−3.5%	3.1%	4.4%	4.6%	5.4%	6.6%
Cash & Investments	9.4%	44.3%	16.8%	1.1%	−2.8%	−3.5%	4.9%	6.2%	6.5%	7.4%	8.7%
Accounts receivable	35.3%	24.9%	15.9%	16.8%	15.9%	13.0%	12.5%	12.8%	13.3%	13.7%	14.2%
Materials & equipment	2.5%	1.7%	1.6%	0.8%	0.5%	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%
Other assets	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total Current Assets	47.5%	71.0%	34.4%	18.9%	13.7%	10.0%	17.9%	19.5%	20.3%	21.7%	23.5%
Fixed assets											
Adusted Cost of Fixed Assets	245.8%	160.9%	197.5%	155.3%	138.3%	139.8%	134.5%	139.4%	146.6%	153.5%	160.4%
Less: Accumulated Depreciation	193.3%	132.0%	131.9%	74.3%	52.0%	49.8%	52.4%	59.0%	66.9%	75.2%	83.9%
Net Revalued Assets	52.5%	29.0%	65.6%	81.1%	86.3%	90.0%	82.1%	80.5%	79.7%	78.3%	76.5%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	40.0%	36.5%	23.0%	24.0%	22.3%	18.3%	17.6%	18.1%	18.7%	19.4%	20.1%
Total Current Liabilities	40.0%	36.5%	23.0%	24.0%	22.3%	18.3%	17.6%	18.1%	18.7%	19.4%	20.1%
Long Term Debt	0.0%	0.0%	37.7%	52.6%	52.5%	51.8%	47.0%	42.1%	37.9%	33.6%	29.4%
Additional debt due to currency rate	0.0%	0.0%	0.0%	22.3%	23.2%	20.7%	20.1%	19.1%	18.0%	16.7%	15.2%
Other Funds	56.5%	37.0%	35.1%	18.4%	11.7%	10.2%	9.8%	10.2%	10.7%	11.2%	11.7%
Total Long Term Liabilities	56.5%	37.0%	72.8%	93.3%	87.4%	82.7%	76.9%	71.3%	66.6%	61.5%	56.3%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	30.6%	27.9%	21.8%	22.3%	25.1%	27.8%	32.1%	36.7%	41.0%	45.2%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	3.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	−4.4%	−23.8%	−39.1%	−32.0%	−26.2%	−22.3%	−21.5%	−22.0%	−21.9%	−21.5%
Net Equity	3.5%	26.5%	4.1%	−17.3%	−9.7%	−1.0%	5.5%	10.6%	14.7%	19.1%	23.6%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	241,855	5,094,379	10,986,346	18,103,705	26,414,914	24,893,530	48,946,254	54,722,025	57,346,021	62,201,332	68,410,232
Current liabilities	203,587	2,621,742	7,354,993	23,004,727	43,127,001	45,357,144	47,970,927	50,566,219	52,851,246	55,698,550	58,509,735
Working capital	38,268	2,472,637	3,631,353	(4,901,022)	(16,712,087)	(20,463,613)	975,327	4,155,806	4,494,775	6,502,781	9,900,497
Change in working capital		2,434,369	1,158,716	(8,532,375)	(11,811,064)	(3,751,526)	21,438,940	3,180,479	338,969	2,008,006	3,397,716
Current ratio	1.19	1.94	1.49	0.79	0.61	0.55	1.02	1.08	1.09	1.12	1.17
Capitalization Table:											
Debt	287,441	2,653,563	23,241,131	89,222,266	168,587,751	204,985,263	210,230,623	199,592,740	188,178,084	176,255,827	163,855,650
Equity	17,807	1,898,869	1,318,400	(16,562,245)	(18,734,055)	(2,556,233)	15,124,881	29,783,710	41,596,138	54,761,747	68,836,094
Percent debt	94.2%	58.3%	94.6%	122.8%	112.5%	101.3%	93.3%	87.0%	81.9%	76.3%	70.4%
Percent equity	5.8%	41.7%	5.4%	−22.8%	−12.5%	−1.3%	6.7%	13.0%	18.1%	23.7%	29.6%
Times Interest Earned:											
Net income	63,322	(316,634)	(7,289,898)	(29,800,694)	(24,400,597)	(3,066,830)	7,875,256	1,611,468	(2,060,543)	(736,379)	453,276
Add back: interest expense	0	0	601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
depreciation	0	384,878	2,101,165	4,953,467	6,895,499	11,544,144	12,255,952	13,012,627	13,814,169	14,666,641	15,571,256
taxes	67,402	983,708	3,245,799	37,109,809	59,325,021	48,895,809	49,279,767	50,001,858	49,525,605	49,638,007	49,695,249
total	130,724	1,051,953	(1,341,576)	15,378,626	51,396,323	68,856,505	82,254,310	76,934,149	72,517,148	73,736,809	74,817,143
Interest	0	0	601,358	3,116,044	7,576,400	11,483,381	12,843,335	12,308,196	11,237,918	10,167,640	9,097,362
Time interest earned			−2.2	4.9	6.8	6.0	6.4	6.3	6.5	7.3	8.2
Operating revenue	3,597,549	35,794,830	101,510,485	323,283,713	613,998,727	646,930,133	683,609,251	720,027,213	751,256,536	790,604,745	829,451,287
Operating expenses (B4 depr, tax)	2,678,553	33,649,537	97,436,385	290,683,490	536,606,787	565,519,564	598,190,671	630,718,603	659,596,375	695,322,239	730,705,862
Operating margin	918,996	2,145,293	4,074,100	32,600,223	77,391,940	81,410,569	85,418,580	89,308,609	91,660,161	95,282,506	98,745,425
Percent	25.5%	6.0%	4.0%	10.1%	12.6%	12.6%	12.5%	12.4%	12.2%	12.1%	11.9%
Net income to total revenue	1.8%	−0.9%	−7.2%	−9.2%	−4.0%	−0.5%	1.2%	0.2%	−0.3%	−0.1%	0.1%
Return on total assets	12.4%	−4.4%	−22.8%	−31.2%	−12.6%	−1.2%	2.9%	0.6%	−0.7%	−0.3%	0.2%
Return on beginning equity		−1778.1%	−383.9%	−2260.4%	147.3%	16.4%	−308.1%	10.7%	−6.9%	−1.8%	0.8%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%	50.0%
Accum. Deprec. / Assets	78.7%	82.0%	66.8%	47.8%	37.6%	35.6%	39.0%	42.3%	45.6%	49.0%	52.3%
Receivables / Sales	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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VOLGOGRAD
Case – VL – 4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		3,127,935	2,184,072	(4,262,268)	(6,438,297)	(3,295,186)	22,145,393	3,876,516	978,506	2,799,390	4,172,245
Accounts receivable		1,605,394	3,276,659	11,057,873	14,495,391	1,641,998	1,828,864	1,815,842	1,557,131	1,961,948	1,936,934
Materials & equipment		106,576	385,580	287,691	227,213	117,849	70,160	74,582	79,004	84,024	89,164
Other assets		12,619	45,655	34,064	26,903	13,954	8,307	8,831	9,355	9,949	10,558
Net fixed assets		1,812,818	18,848,381	56,632,865	89,004,740	56,326,862	1,487,533	840,468	58,801	(764,653)	(1,723,547)
		6,665,342	24,740,347	63,750,225	97,315,950	54,805,477	25,540,257	6,616,239	2,682,797	4,090,658	4,485,354
Credits:											
Accounts payable		2,418,155	4,733,251	15,649,735	20,122,274	2,230,143	2,613,784	2,595,292	2,285,026	2,847,305	2,811,184
Long term debt		0	12,027,163	38,266,556	50,940,565	27,199,062	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
Currency fluctuation on L/T debt			0	21,327,447	23,380,492	6,582,035	3,687,716	(1,590,929)	(2,465,885)	(3,084,935)	(3,676,958)
Other funds		2,366,125	8,560,403	6,387,132	5,044,428	2,616,416	1,557,643	1,655,825	1,754,007	1,865,457	1,979,560
Equity/retained earnings		1,881,062	(580,469)	(17,880,645)	(2,171,810)	16,177,822	17,681,114	14,658,829	11,812,428	13,165,609	14,074,347
		6,665,342	24,740,348	63,750,225	97,315,949	54,805,478	25,540,257	6,616,238	2,682,797	4,090,657	4,485,354
check: net change debits and credits		0	1	0	(1)	1	0	(1)	0	(1)	0
Does balance sheet balance?		(0)	(2)	(1)	(1)	(2)	(2)	(3)	(2)	(4)	(2)
check. analysis of change in fixed assets		(0)	(0)	0	0	(0)	(0)	0	(0)	(0)	0
check: analysis of change in equity/RE		(0)	0	0	(0)	(0)	0	(0)	0	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	0	0	(0)	0	0	0
Analysis of change in net fixed assets:											
Revaluation write up of assets		10,295,611	37,248,492	35,902,774	42,589,509	30,833,004	21,354,242	22,700,250	24,046,258	25,574,160	27,138,440
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,982,725)	(20,360,722)	(11,588,352)	(7,610,756)	(8,847,155)	(10,173,288)	(11,672,171)	(13,290,731)
Current depreciation		(384,878)	(2,101,165)	(4,953,467)	(8,895,499)	(11,544,144)	(12,255,952)	(13,012,627)	(13,814,169)	(14,666,641)	(15,571,256)
New capital expenditures, net		0	14,2[illegible]3,118	49,666,282	75,671,452	48,626,354	0	0	0	0	0
		1,812,818	18,848,381	56,632,865	69,004,740	56,326,862	1,487,533	840,468	58,801	(764,653)	(1,723,547)
Analysis of change in net equity/RE											
Net income		(316,634)	(7,289,898)	(29,800,694)	(24,400,597)	(3,066,830)	7,875,256	1,611,468	(2,060,543)	(736,379)	453,276
Revaluation surplus (direct cr. to equity)		10,295,611	37,248,492	35,902,774	42,589,509	30,833,004	21,354,242	22,700,250	24,046,258	25,574,160	27,138,440
Revaluation of accum depreciation		(8,097,915)	(30,539,064)	(23,982,725)	(20,360,722)	(11,588,352)	(7,610,756)	(8,847,155)	(10,173,288)	(11,672,171)	(13,290,731)
Dividends declared		0	0	0	0	0	(3,937,628)	(805,734)	0	0	(226,638)
		1,881,062	(580,469)	(17,880,645)	(2,171,810)	16,177,822	17,681,114	14,658,829	11,812,428	13,165,609	14,074,347
Analysis of change in long term debt:											
New debt issued		0	12,027,163	38,266,556	50,940,565	27,199,062	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)
		0	12,027,163	38,266,556	50,940,565	27,199,062	0	(10,702,779)	(10,702,779)	(10,702,779)	(10,702,779)

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VORONEZH

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INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		593,732	3,584,853	21,295,443	52,128,905	52,691,959	53,087,194	53,480,065	53,876,586	55,300,343	56,754,560
Natural Gas, Other		40,621,818	113,013,051	360,182,439	671,521,128	707,640,702	750,378,606	792,713,918	829,924,079	876,666,672	922,805,462
Natural Gas, Total		41,215,549	116,597,904	381,477,882	723,650,034	760,332,660	803,465,800	846,193,982	883,800,664	931,967,016	979,560,022
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,525,955	41,225,427	116,639,648	381,543,403	723,734,333	760,426,699	803,565,637	846,299,983	883,913,195	932,086,490	979,686,866
Other Revenues	19,101	157,233	664,469	1,042,930	1,341,830	1,496,863	1,589,159	1,687,272	1,791,204	1,901,739	2,019,035
TOTAL OPERATING INCOME	**3,545,056**	**41,382,661**	**117,304,117**	**382,586,333**	**725,076,163**	**761,923,562**	**805,154,796**	**847,987,256**	**885,704,399**	**933,988,229**	**981,705,901**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		216,778	1,290,547	7,666,359	18,766,406	18,969,105	19,111,390	19,252,823	19,395,571	19,908,124	20,431,642
Natural Gas, Other		36,163,214	100,608,869	320,649,230	597,815,744	629,970,875	668,017,916	705,706,553	738,832,569	780,444,750	821,519,400
Natural Gas, Total		36,379,992	101,899,416	328,315,590	616,582,150	648,939,980	687,129,306	724,959,376	758,228,140	800,352,874	841,951,041
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,395,496	36,405,508	102,007,245	328,484,836	616,799,902	649,182,890	687,387,194	725,233,186	758,518,816	800,661,487	842,278,639
Payroll (Wages & Bonus)	201,650	1,861,570	7,866,994	12,347,793	15,886,637	17,722,145	18,814,887	19,976,506	21,207,004	22,515,687	23,904,419
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	176,298	1,627,528	6,877,934	10,795,394	13,889,325	15,494,068	16,449,427	17,465,004	18,540,800	19,684,952	20,899,088
TOTAL OPERATING EXPENSES	**2,773,444**	**39,894,606**	**116,752,173**	**351,628,023**	**646,575,864**	**682,399,102**	**722,651,507**	**762,674,696**	**798,266,620**	**842,862,127**	**887,082,196**
EARNINGS BEFORE TAXES, SUSBSIDIES AND DEPRECIATION	**771,612**	**1,488,055**	**551,943**	**30,958,310**	**78,500,300**	**79,524,459**	**82,503,289**	**85,312,560**	**87,437,779**	**91,126,103**	**94,623,705**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	128,747	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	**128,747**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		612,911	2,791,651	5,153,567	8,145,802	10,031,190	10,649,710	11,307,217	12,003,710	12,744,459	13,530,516
Value Added Tax (on Sales)	771,303	803,220	2,438,734	8,843,095	17,822,405	18,540,635	19,363,074	20,177,800	20,899,063	21,904,167	22,901,363
Net Value Added Tax (on Projects)		0	1,154,783	3,879,123	6,011,037	(1,108,605)	(7,172,340)	(2,763,998)	0	0	0
Gas Rehabilitation Fund		481,992	1,463,240	5,305,857	10,693,443	11,124,381	11,617,844	12,106,680	12,539,438	13,142,500	13,740,818
TOTAL DEDUCTIONS	**771,303**	**1,898,223**	**7,848,408**	**23,181,641**	**42,672,688**	**38,587,601**	**34,458,288**	**40,827,699**	**45,442,211**	**47,791,126**	**50,172,697**
NET INCOME BEFORE INTEREST and TAXES	**129,056**	**(391,530)**	**(7,230,379)**	**7,880,394**	**35,961,064**	**41,085,729**	**48,203,051**	**44,652,670**	**42,173,713**	**43,524,115**	**44,651,812**
INTEREST and TAXES											
Interest Expenses		0	270,771	1,415,292	3,662,734	5,723,631	6,410,836	6,143,717	5,609,481	5,075,245	4,541,009
Currency fluctuation loss on debt			0	9,706,864	11,631,843	3,285,466	1,840,748	1,628,455	1,430,058	1,335,845	1,226,538
Taxes:											
Corporate Income Tax	41,298	476,178	176,622	9,906,559	25,120,096	25,447,827	26,401,052	27,300,019	27,980,089	29,160,353	30,279,586
Excess Payroll Tax	33,267	363,006	1,534,064	2,407,820	3,097,894	3,455,818	3,663,903	3,895,419	4,135,366	4,390,559	4,661,362
Property Tax		225,807	1,604,599	2,089,770	4,065,887	6,078,228	6,409,919	6,853,039	7,180,076	7,449,814	7,773,635
Road Tax		19,280	58,530	212,234	427,738	444,975	464,714	484,267	501,578	525,700	549,633
TOTAL INTEREST and TAXES	**74,565**	**1,084,270**	**3,644,585**	**25,738,638**	**48,006,192**	**44,435,945**	**45,196,172**	**46,304,917**	**46,836,647**	**47,937,516**	**49,031,761**
NET INCOME	**54,491**	**(1,476,800)**	**(10,874,965)**	**(17,858,244)**	**(12,045,128)**	**(3,350,217)**	**3,006,879**	**(1,652,247)**	**(4,662,935)**	**(4,413,401)**	**(4,379,949)**
Memo: Weighted Ave Cost of Gas		8,839	25,851	83,914	154,303	159,816	165,253	171,003	177,057	183,079	189,280
Memo: Weighted Ave Sales Price of Gas		10,156	29,968	98,782	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,192	3,778	13,765	27,147	27,795	28,350	28,977	29,714	30,509	31,350
Memo: Cash Flow From Natural Gas		4,835,557	14,698,488	53,162,292	107,067,884	111,392,680	116,336,494	121,234,606	125,572,524	131,614,142	137,608,981
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	95	877	4,583	6,694	8,361	9,226	9,741	10,288	10,868	11,484	12,139
Short–Term Investments	48,377	13,633,700	45,728,351	96,413,649	149,462,738	159,603,426	185,772,731	201,823,598	214,642,656	229,921,649	246,018,815
Cash & Short Term Investments	**48,472**	13,634,577	45,732,934	96,420,343	149,471,100	159,612,652	185,782,472	201,833,886	214,653,524	229,933,134	246,030,954
Accounts receivable – Gross *(See Note C.)*	**1,144,106**	13,376,875	37,847,369	123,803,650	234,838,162	246,744,144	260,741,917	274,608,408	286,813,187	302,444,514	317,889,939
Materials & equipment	**67,033**	619,105	2,616,336	4,106,521	5,283,439	5,893,877	6,257,291	6,643,612	7,052,841	7,488,071	7,949,923
Other assets	**40,905**	377,622	1,595,831	2,504,768	3,222,628	3,594,963	3,816,627	4,052,264	4,301,872	4,567,340	4,849,047
Total Current Assets	1,300,546	28,008,179	87,792,471	226,835,282	392,815,329	415,845,636	456,598,308	487,138,170	512,821,423	544,433,059	576,719,863
Fixed assets											
Adusted Cost of Fixed Assets	1,991,762	18,387,323	83,749,522	154,607,003	244,374,074	300,935,709	319,491,304	339,216,502	360,111,303	382,333,761	405,915,488
Less: Accumulated Depreciation	846,313	8,425,808	38,399,117	65,423,643	92,319,685	113,017,294	130,635,612	150,008,192	171,251,992	194,564,407	220,095,340
Net Revalued Assets	1,145,449	9,961,517	45,350,405	89,183,360	152,054,389	187,918,416	188,855,692	189,208,310	188,859,310	187,769,354	185,820,148
TOTAL ASSETS	**2,445,995**	**37,969,695**	**133,142,876**	**316,018,642**	**544,869,718**	**603,764,052**	**645,454,000**	**676,346,480**	**701,680,733**	**732,202,414**	**762,540,011**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**1,303,664**	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Total Current Liabilities	1,303,664	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Long Term Debt		0	5,415,413	22,890,423	50,364,263	64,108,355	64,108,355	58,765,993	53,423,630	48,081,267	42,738,904
Additional debt due to currency rate			0	9,706,864	21,338,706	24,624,173	26,464,921	25,752,261	24,602,862	23,144,459	21,390,544
Other Funds	**1,101,205**	10,165,981	42,961,435	67,430,951	86,756,481	96,780,138	102,747,568	109,091,140	115,810,854	122,957,538	130,541,360
Total Long Term Liabilities	1,101,205	10,165,981	48,376,848	100,028,238	158,459,450	185,512,666	193,320,644	193,009,394	193,837,345	194,183,264	194,670,808
Other Liabilities & Equity											
Net Revaluation Surplus		9,428,979	41,564,832	67,395,032	92,954,744	110,522,781	122,109,767	133,769,602	145,424,312	157,078,815	168,660,124
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126
Retained Earnings	0	(1,478,800)	(12,353,765)	(30,212,009)	(42,257,137)	(45,607,353)	(44,103,913)	(45,756,161)	(50,419,095)	(54,832,497)	(59,212,445)
Net Equity	41,126	7,991,305	29,252,193	37,224,149	50,738,733	64,956,554	78,046,980	88,054,567	95,046,343	102,287,444	109,488,805
TOTAL LIABILITIES & EQUITY	**2,445,995**	**37,969,696**	**133,142,878**	**316,018,644**	**544,869,721**	**603,764,054**	**645,454,000**	**676,346,480**	**701,680,734**	**732,202,413**	**762,540,009**

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		(1,478,800)	(10,874,965)	(17,858,244)	(12,045,128)	(3,350,217)	3,006,879	(1,652,247)	(4,662,935)	(4,413,401)	(4,379,949)
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		612,911	2,791,651	5,153,567	8,145,802	10,031,190	10,649,710	11,307,217	12,003,710	12,744,459	13,530,516
Currency fluctuation loss on L/T debt			0	9,706,864	11,631,843	3,285,456	1,840,748	1,628,455	1,430,058	1,335,845	1,226,538
Changes in assets and liabilities:											
Accounts receivable		(12,232,769)	(24,470,495)	(85,956,280)	(111,034,513)	(11,905,982)	(13,997,773)	(13,866,491)	(12,204,779)	(15,631,327)	(15,445,425)
Materials and supplies		(552,042)	(1,997,232)	(1,490,185)	(1,176,918)	(610,437)	(363,414)	(386,321)	(409,228)	(435,231)	(461,852)
Other assets		(336,717)	(1,218,209)	(908,937)	(717,860)	(372,335)	(221,664)	(235,636)	(249,608)	(265,468)	(281,706)
Accounts payable		18,508,746	35,701,426	123,252,421	156,905,280	17,623,296	20,791,342	20,596,343	18,114,527	22,934,659	22,648,691
Other funds		9,064,776	32,795,454	24,469,516	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,146,685	7,583,822
Net cash provided by operations		**13,586,105**	**32,727,630**	**56,368,722**	**71,034,036**	**24,724,639**	**27,673,259**	**23,734,892**	**20,741,459**	**23,416,220**	**24,420,635**
Cash flows from investing activities:											
Note: Does not include internally-funded routine capital expenditures											
Capital expenditures – Domestic		0	(629,273)	(5,681,312)	(17,983,280)	(14,583,087)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(5,415,413)	(17,475,009)	(27,473,840)	(13,744,093)	0	0	0	0	0
Net cash used in investing activities		**0**	**(6,044,686)**	**(23,156,322)**	**(45,457,120)**	**(28,327,180)**	**0**	**0**	**0**	**0**	**0**
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	5,415,413	17,475,009	27,473,840	13,744,093	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(5,342,363)	(5,342,363)	(5,342,363)	(5,342,363)
Loss on Currency Fluctuation		0	0	0	0	0	0	(2,341,115)	(2,579,458)	(2,794,247)	(2,980,452)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(1,503,440)	0	0	0	0
Net cash provided (used in) financing activities		**0**	**5,415,413**	**17,475,009**	**27,473,840**	**13,744,093**	**(1,503,440)**	**(7,683,478)**	**(7,921,821)**	**(8,136,610)**	**(8,322,815)**
Net increase (decrease) in cash and cash equivalents		13,586,105	32,098,357	50,687,409	53,050,757	10,141,552	26,169,820	16,051,414	12,819,638	15,279,610	16,097,820
Cash and cash equivalents – beginning		48,472	13,634,577	45,732,934	96,420,343	149,471,100	159,612,652	185,782,472	201,833,886	214,653,524	229,933,134
Cash and cash equivalents – ending		13,634,577	45,732,934	96,420,343	149,471,100	159,612,652	185,782,472	201,833,886	214,653,524	229,933,134	246,030,954

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	**1,919,208**	1,991,762	18,387,325	83,749,522	154,607,003	244,374,074	300,935,709	319,491,304	339,216,502	360,111,303	382,333,761
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,919,208	18,387,325	77,704,836	131,450,681	198,916,955	272,608,529	319,491,304	339,216,502	360,111,303	382,333,761	405,915,488
New Investments (Current Year)	**0**	0	6,044,686	23,153,322	45,457,120	28,327,180	0	0	0	0	0
Capitalized Costs	**72,537**										
Work in Progress	**17**										
Ending Value of Assets (Gross)	1,991,762	18,387,325	83,749,522	154,607,003	244,374,074	300,935,709	319,491,304	339,216,502	360,111,303	382,333,761	405,915,488
Accumulated Depreciation		846,313	8,425,808	38,399,117	65,423,643	92,319,685	113,017,294	130,635,612	150,008,132	171,251,992	194,564,407
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	**846,313**	7,812,897	35,607,466	60,270,076	84,173,883	102,986,103	119,985,902	138,700,975	159,248,282	181,819,948	206,564,824
Current Depreciation		612,911	2,791,651	5,153,567	8,145,802	10,031,190	10,649,710	11,307,217	12,003,710	12,744,459	13,530,516
Net Value of Assets	1,145,449	9,961,517	45,350,405	89,183,360	152,054,389	187,918,416	188,855,692	189,208,310	188,859,310	187,769,354	185,820,148
Accum. Revaluation Surplus		16,395,563	75,713,074	123,414,233	167,724,185	195,958,640	214,514,235	234,239,433	255,134,233	277,356,692	300,938,419
Accum. Reevaluated Depreciation		6,966,584	34,148,242	56,019,201	74,769,442	85,435,959	92,404,468	100,469,831	109,709,921	120,277,877	132,278,294
Net Reevaluation Surplus		9,428,979	41,564,832	67,395,032	92,954,744	110,522,781	122,109,767	133,769,602	145,424,312	157,078,815	168,660,124

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	305,375	301,081	295,902	290,184	284,106	277,731	271,138	264,419	257,620	255,981	254,320
Other	3,986,282	3,814,685	3,645,949	3,622,357	3,711,800	3,782,822	3,886,907	3,975,029	4,024,769	4,115,641	4,193,851
Total	4,291,657	4,115,766	3,941,851	3,912,541	3,995,906	4,060,553	4,158,045	4,239,448	4,282,389	4,371,622	4,448,171
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Natural Gas – Sales											
Residential	301,100	296,866	295,902	290,184	284,106	277,731	271,138	264,419	257,620	255,981	254,320
Other	3,930,474	3,761,279	3,594,906	3,571,644	3,659,835	3,729,862	3,832,490	3,919,379	3,968,422	4,058,022	4,135,137
Total	4,231,574	4,058,145	3,890,808	3,861,828	3,943,941	4,007,593	4,103,628	4,183,798	4,226,042	4,314,003	4,389,457
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	2%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.00%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,980	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		−14.8%	−24.0%	−20.0%	−7.9%	−1.8%	1.6%	−0.9%	−2.5%	−2.4%	−2.4%
Average over Period 1998–2002							−1.3%				
External Financing		0.0%	93.8%	81.6%	69.8%	64.2%	64.2%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993-US$ x 000)			33.00	1015.00	3095.00	2467.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			33	1,052	3,309	2,729	0	0	0	0	0
Duties on Foreign Suppliers			270,771	873,750	1,373,692	687,205	0	0	0	0	0
Domestic Supplier (Current-Rubles x 000)			358,502	4,807,562	16,609,588	13,896,883	0	0	0	0	0
Foreign Supplier (1993-US$ x 000)			2037.00	4563.00	5581.00	2567.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			2,061	4,727	5,966	2,839	0	0	0	0	0
Foreign Supplier (Current-Rubles x 000)			5,415,413	17,475,009	27,473,840	13,744,093	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		(865,889)	(8,083,314)	(12,704,677)	(3,899,325)	6,680,974	13,656,589	9,654,970	7,340,775	8,331,057	9,150,568
Less Retirements			0	0	0	0	0	(5,342,363)	(5,342,363)	(5,342,363)	(5,342,363)
Less Domestic Suppliers		0	(629,273)	(5,681,312)	(17,983,280)	(14,583,087)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(1,503,440)	0	0	0	0
Funds Available/(Required)		(865,889)	(8,712,587)	(18,385,989)	(21,882,605)	(7,902,114)	12,153,150	4,312,607	1,998,412	2,988,694	3,808,205
External Sources (Foreign Projects)		0	5,415,413	17,475,009	27,473,840	13,744,093	0	0	0	0	0
Accumulative Long-Term Debt			5,415,413	22,890,423	50,364,263	64,108,355	64,108,355	58,765,993	53,423,630	48,081,267	42,738,904
Retirements								5,342,363	5,342,363	5,342,363	5,342,363
Interest			270,771	1,415,292	3,662,734	5,723,631	6,410,836	6,143,717	5,609,481	5,075,245	4,541,009
Memo: Total Project		0	5,773,915	28,056,486	72,139,914	99,779,890	99,779,890	99,779,890	99,779,890	99,779,890	99,779,890
Memo: % Externally Financed		0.0%	93.8%	81.6%	69.8%	64.2%	64.2%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(1,478,800)	(12,353,765)	(30,212,009)	(42,257,137)	(45,607,353)	(44,103,913)	(45,756,161)	(50,419,095)	(54,832,497)
adjusted net income		(1,478,800)	(10,874,965)	(17,858,244)	(12,045,128)	(3,350,217)	3,006,879	(1,652,247)	(4,662,935)	(4,413,401)	(4,379,949)
less: dividends		0	0	0	0	0	(1,503,440)	0	0	0	0
Ending retained earnings - to B/S		(1,478,800)	(12,353,765)	(30,212,009)	(42,257,137)	(45,607,353)	(44,103,913)	(45,756,161)	(50,419,095)	(54,832,497)	(59,212,445)

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			5,773,915								
VAT Payment			1,154,783								
VAT Recapture				(577,392)	(577,392)						
1995 Investment				22,262,571							
VAT Payment				4,456,514							
VAT Recapture					(2,228,257)	(2,228,257)					
1995 Investment					44,083,428						
VAT Payment					8,816,686						
VAT Recapture						(4,408,343)	(4,408,343)				
1996 Investment						27,639,976					
VAT Payment						5,527,995					
VAT Recapture							(2,763,998)	(2,763,998)			
Value Added Tax on Projects		0	1,154,783	4,456,514	8,816,686	5,527,995	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(577,392)	(2,805,649)	(6,636,600)	(7,172,340)	(2,763,998)	0	0	0
Net V.A.T. on Projects		0	1,154,783	3,879,123	6,011,037	(1,108,605)	(7,172,340)	(2,763,998)	0	0	0
On Sales											
(a) GAS & LPG Purchases		36,405,508	102,007,245	328,484,836	616,799,902	649,182,890	687,387,194	725,233,186	758,518,616	800,661,487	842,278,689
(b) Commodity = = Purchases / (1 + VAT Rate)		30,337,923	85,006,038	273,737,363	513,999,910	540,985,741	572,822,661	604,360,988	632,099,013	667,217,906	701,898,908
(c) VAT Included = Line (b) – Line (b)		6,067,585	17,001,208	54,747,473	102,799,984	108,197,148	114,564,532	120,872,198	126,419,603	133,443,581	140,379,782
(d) GAS & LPG Sales		41,225,427	116,639,648	381,543,403	723,734,333	760,426,699	803,565,637	846,299,983	883,913,195	932,086,490	979,686,866
(e) Commodity = = Purchases / (1 + VAT Rate)		34,354,523	97,199,707	317,952,836	603,111,944	633,688,916	669,638,031	705,249,986	736,594,329	776,738,742	816,405,722
(f) VAT Included = Line (d) – Line (e)		6,870,905	19,439,941	63,590,567	120,622,389	126,737,783	133,927,606	141,049,997	147,318,866	155,347,748	163,281,144
(g) Utility's VAT Liability = Line (f) – Line (c)		803,320	2,438,734	8,843,095	17,822,405	18,540,635	19,363,074	20,177,800	20,899,063	21,904,167	22,901,363
Test											
Margin on GAS & LPG Sales		4,819,920	14,632,403	53,058,567	106,934,431	111,243,809	116,178,443	121,066,798	125,394,379	131,425,004	137,408,177
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			22,890,423	50,364,263	64,108,355	64,108,355	58,765,993	53,423,630	48,081,267	42,738,904
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			2,595	2,526	679	370	318	272	247	221
Additional ruble debt/expense to record – in rubles			9,706,864	11,631,843	3,285,466	1,840,748	1,528,455	1,430,058	1,335,845	1,226,538
cumulative			9,706,864	21,338,706	24,624,173	26,464,921	28,093,376	29,523,434	30,859,279	32,085,816
Computation of payment on additional L/T debt – 1/12th							2,341,115	2,579,458	2,794,247	2,980,452
cumulative							2,341,115	4,920,572	7,714,820	10,695,272

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short–Term Investments	2.0%	35.9%	34.3%	30.5%	27.4%	26.4%	28.8%	29.8%	30.6%	31.4%	32.3%
Cash & Investments	2.0%	35.9%	34.3%	30.5%	27.4%	26.4%	28.8%	29.8%	30.6%	31.4%	32.3%
Accounts receivable	46.8%	35.2%	28.4%	39.2%	43.1%	40.9%	40.4%	40.6%	40.9%	41.3%	41.7%
Materials & equipment	2.7%	1.6%	2.0%	1.3%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Other assets	1.7%	1.0%	1.2%	0.8%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Total Current Assets	53.2%	73.8%	65.9%	71.8%	72.1%	68.9%	70.7%	72.0%	73.1%	74.4%	75.6%
Fixed assets											
Adusted Cost of Fixed Assets	81.4%	48.4%	62.9%	48.9%	44.9%	49.8%	49.5%	50.2%	51.3%	52.2%	53.2%
Less: Accumulated Depreciation	34.6%	22.2%	28.8%	20.7%	16.9%	18.7%	20.2%	22.2%	24.4%	26.6%	28.9%
Net Revalued Assets	46.8%	26.2%	34.1%	28.2%	27.9%	31.1%	29.3%	28.0%	26.9%	25.6%	24.4%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	53.3%	52.2%	41.7%	56.6%	61.6%	58.5%	58.0%	58.4%	58.8%	59.5%	60.1%
Total Current Liabilities	53.3%	52.2%	41.7%	56.6%	61.6%	58.5%	58.0%	58.4%	58.8%	59.5%	60.1%
Long Term Debt	0.0%	0.0%	4.1%	7.2%	9.2%	10.6%	9.9%	8.7%	7.6%	6.6%	5.6%
Additional debt due to currency rate	0.0%	0.0%	0.0%	3.1%	3.9%	4.1%	4.1%	3.8%	3.5%	3.2%	2.8%
Other Funds	45.0%	26.8%	32.3%	21.3%	15.9%	16.0%	15.9%	16.1%	16.5%	16.8%	17.1%
Total Long Term Liabilities	45.0%	26.8%	36.3%	31.7%	29.1%	30.7%	30.0%	28.6%	27.6%	26.5%	25.5%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	24.8%	31.2%	21.3%	17.1%	18.3%	18.9%	19.8%	20.7%	21.5%	22.1%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	−3.9%	−5.3%	−9.6%	−7.8%	−7.0%	−6.8%	−6.8%	−7.2%	−7.5%	−7.8%
Net Equity	1.7%	21.0%	22.0%	11.8%	9.3%	10.8%	12.1%	13.0%	13.5%	14.0%	14.4%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
RATIOS											
Current assets	1,300,546	28,008,179	87,792,471	226,835,282	392,815,329	415,845,636	456,598,308	487,138,170	512,821,423	544,433,059	576,719,863
Current liabilities	1,303,664	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Working capital	(3,118)	8,195,768	32,278,634	48,069,024	57,143,791	62,550,801	82,512,131	92,455,651	100,024,377	108,701,354	118,339,467
Change in working capital		8,198,886	24,082,866	15,790,390	9,074,767	5,407,010	19,961,330	9,943,520	7,568,726	8,676,978	9,638,113
Current ratio	1.00	1.41	1.58	1.27	1.17	1.18	1.22	1.23	1.24	1.25	1.26
Capitalization Table:											
Debt	1,101,205	10,165,981	48,376,848	100,028,238	158,459,450	185,512,666	193,320,844	193,309,394	193,837,345	194,183,264	194,670,808
Equity	41,126	7,991,305	29,252,193	37,224,149	50,738,733	64,956,554	78,046,980	88,054,567	95,046,343	102,287,444	109,488,805
Percent debt	96.4%	56.0%	62.3%	72.9%	75.7%	74.1%	71.2%	68.7%	67.1%	65.5%	64.0%
Percent equity	3.6%	44.0%	37.7%	27.1%	24.3%	25.9%	28.8%	31.3%	32.9%	34.5%	36.0%
Times Interest Earned:											
Net income	54,491	(1,478,800)	(10,874,965)	(17,858,244)	(12,045,128)	(3,350,217)	3,006,879	(1,652,247)	(4,662,935)	(4,413,401)	(4,379,949)
Add back: interest expense	0	0	270,771	1,415,292	3,662,734	5,723,631	6,410,836	6,143,717	5,609,481	5,075,245	4,541,009
depreciation	0	612,911	2,791,651	5,153,567	8,145,802	10,031,190	10,649,710	11,307,217	12,003,710	12,744,459	13,530,516
taxes	74,565	1,084,270	3,644,565	25,738,638	48,006,192	44,435,945	45,196,172	46,304,917	46,836,647	47,937,516	49,031,761
total	129,056	218,381	(4,167,958)	14,449,253	47,769,601	56,840,550	65,263,597	62,103,604	59,705,904	61,343,818	62,723,337
Interest	0	0	270,771	1,415,292	3,662,734	5,723,631	6,410,836	6,143,717	5,609,481	5,075,245	4,541,009
Time interest earned			−15.4	10.2	13.0	9.9	10.2	10.1	10.7	12.1	13.8
Operating revenue	3,525,955	41,225,427	116,639,648	381,543,403	723,734,333	760,426,699	803,565,637	846,299,983	883,913,195	932,086,490	979,686,866
Operating expenses (B4 depr, tax)	2,773,444	39,894,606	116,752,173	351,628,023	646,575,864	682,399,102	722,651,507	762,674,696	798,266,620	842,862,127	887,082,196
Operating margin	752,511	1,330,822	(112,525)	29,915,381	77,158,469	78,027,596	80,914,130	83,625,288	85,646,575	89,224,364	92,604,670
Percent	21.3%	3.2%	−0.1%	7.8%	10.7%	10.3%	10.1%	9.9%	9.7%	9.6%	9.5%
Net income to total revenue	1.5%	−3.6%	−9.3%	−4.7%	−1.7%	−0.4%	0.4%	−0.2%	−0.5%	−0.5%	−0.4%
Return on total assets	2.2%	−3.9%	−8.2%	−5.7%	−2.2%	−0.6%	0.5%	−0.2%	−0.7%	−0.6%	−0.6%
Return on beginning equity		−3595.8%	−138.1%	−61.0%	−32.4%	−6.6%	4.6%	−2.1%	−5.3%	−4.6%	−4.3%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
Accum. Deprec. / Assets	42.5%	45.8%	45.8%	42.3%	37.8%	37.6%	40.9%	44.2%	47.6%	50.9%	54.2%
Receivables / Sales	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		13,586,105	32,098,357	50,687,409	53,050,757	10,141,552	26,169,820	16,051,414	12,819,638	15,279,610	16,097,820
Accounts receivable		12,232,769	24,470,495	85,956,280	111,034,513	11,905,982	13,997,773	13,866,491	12,204,779	15,631,327	15,445,425
Materials & equipment		552,042	1,997,232	1,490,185	1,176,918	610,437	363,414	386,321	409,228	435,231	461,852
Other assets		336,717	1,218,209	908,937	717,860	372,335	221,664	235,636	249,608	265,468	281,706
Net fixed assets		8,816,068	35,388,888	43,832,955	62,871,029	35,864,027	937,276	352,518	(349,000)	(1,089,956)	(1,949,207)
		35,523,701	95,173,181	182,875,766	228,851,077	58,894,333	41,689,947	30,892,480	25,334,253	30,521,680	30,337,596
Credits:											
Accounts payable		18,508,746	35,701,426	123,252,421	156,905,280	17,623,296	20,791,342	20,596,343	18,114,527	22,934,659	22,648,691
Long term debt		0	5,415,413	17,475,009	27,473,840	13,744,093	0	(5,342,363)	(5,342,363)	(5,342,363)	(5,342,363)
Currency fluctuation on L/T debt			0	9,706,864	11,631,843	3,285,466	1,840,748	(712,659)	(1,149,400)	(1,458,402)	(1,753,915)
Other funds		9,064,776	32,795,454	24,469,516	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,146,685	7,583,822
Equity/retained earnings		7,950,179	21,260,888	7,971,956	13,514,584	14,217,820	13,090,426	10,007,588	6,991,775	7,241,101	7,201,361
		35,523,701	95,173,181	182,875,766	228,851,077	58,894,332	41,689,947	30,892,481	25,334,252	30,521,680	30,337,596
check: net change debits and credits		0	0	0	0	(1)	0	1	(1)	0	0
Does balance sheet balance?		1	2	2	3	2	0	(0)	0	(1)	(2)
check: analysis of change in fixed assets		0	(0)	0	0	0	(0)	(0)	0	(0)	(0)
check: analysis of change in equity/RE		0	(0)	(0)	0	(0)	0	0	(0)	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	(0)	(0)	0	0	0	(0)	0	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		16,395,563	59,317,511	47,701,159	44,309,952	28,234,455	18,555,595	19,725,198	20,894,801	22,222,458	23,581,727
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(21,870,959)	(18,750,240)	(10,656,418)	(6,968,608)	(8,065,363)	(9,240,091)	(10,567,956)	(12,000,417)
Current depreciation		(612,911)	(2,791,651)	(5,153,567)	(8,145,802)	(10,031,190)	(10,649,710)	(11,307,217)	(12,003,710)	(12,744,459)	(13,530,516)
New capital expenditures, net		0	6,044,686	23,156,322	45,457,120	28,327,180	0	0	0	0	0
		8,816,068	35,388,888	43,832,955	62,871,029	35,864,027	937,276	352,618	(349,000)	(1,089,956)	(1,949,207)
Analysis of change in net equity/RE											
Net income		(1,478,800)	(10,874,965)	(17,858,244)	(12,045,128)	(3,350,217)	3,006,879	(1,652,247)	(4,662,935)	(4,413,401)	(4,379,949)
Revaluation surplus (direct cr. to equity)		16,395,563	59,317,511	47,701,159	44,309,952	28,234,455	18,555,595	19,725,198	20,894,801	22,222,458	23,581,727
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(21,870,959)	(18,750,240)	(10,656,418)	(6,968,608)	(8,065,363)	(9,240,091)	(10,567,956)	(12,000,417)
Dividends declared		0	0	0	0	0	(1,503,440)	0	0	0	0
		7,950,179	21,260,888	7,971,956	13,514,584	14,217,820	13,090,426	10,007,588	6,991,775	7,241,101	7,201,361
Analysis of change in long term debt:											
New debt issued		0	5,415,413	17,475,009	27,473,840	13,744,093	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(5,342,363)	(5,342,363)	(5,342,363)	(5,342,363)
		0	5,415,413	17,475,009	27,473,840	13,744,093	0	(5,342,363)	(5,342,363)	(5,342,363)	(5,342,363)

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INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		593,732	3,584,853	21,295,443	52,128,905	52,691,959	53,087,194	53,480,065	53,876,586	55,300,343	56,754,560
Natural Gas, Other		40,621,818	113,414,213	362,739,516	678,672,216	717,688,338	761,033,069	803,969,490	841,707,991	889,114,272	935,908,177
Natural Gas, Total		41,215,549	116,999,066	384,034,959	730,801,121	770,380,297	814,120,263	857,449,555	895,584,576	944,414,616	992,662,737
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,525,955	41,225,427	117,040,810	384,100,479	730,885,420	770,474,336	814,220,100	857,555,556	895,697,107	944,534,090	992,789,580
Other Revenues	19,101	157,233	664,469	1,042,930	1,341,830	1,496,863	1,589,159	1,687,272	1,791,204	1,901,739	2,019,035
TOTAL OPERATING INCOME	**3,545,056**	**41,382,661**	**117,705,279**	**385,143,409**	**732,227,250**	**771,971,198**	**815,809,259**	**859,242,829**	**897,488,311**	**946,435,829**	**994,808,615**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		216,778	1,290,547	7,666,359	18,766,406	18,969,105	19,111,390	19,252,823	19,395,571	19,908,124	20,431,642
Natural Gas, Other		36,163,214	100,608,869	320,649,230	597,815,744	629,970,875	668,017,916	705,706,553	738,832,569	780,444,750	821,519,400
Natural Gas, Total		36,379,992	101,899,416	328,315,590	616,582,150	648,939,980	687,129,306	724,959,376	758,228,140	800,352,874	841,951,041
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,395,496	36,405,508	102,007,245	328,484,836	616,799,902	649,182,890	687,387,194	725,233,186	758,518,816	800,661,487	842,278,689
Payroll (Wages & Bonus)	201,650	1,861,570	7,866 994	12,347,793	15,886,637	17,722,145	18,814,887	19,976,506	21,207,004	22,515,687	23,904,419
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	176,298	1,627,528	6,877,934	10,795,394	13,889,325	15,494,068	16,449,427	17,465,004	18,540,800	19,684,952	20,899,088
TOTAL OPERATING EXPENSES	**2,773,444**	**39,894,606**	**116,752,173**	**351,628,023**	**646,575,864**	**682,399,102**	**722,651,507**	**762,674,696**	**798,266,620**	**842,862,127**	**887,082,196**
EARNINGS BEFORE TAXES, SUSBSIDIES AND DEPRECIATION	**771,612**	**1,488,055**	**953,105**	**33,515,386**	**85,651,387**	**89,572,096**	**93,157,752**	**96,568,133**	**99,221,691**	**103,573,702**	**107,726,419**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	128,747	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	**128,747**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		612,911	2,935,814	5,707,818	8,789,999	10,791,864	11,457,286	12,164,652	12,913,961	13,710,881	14,556,546
Value Added Tax (on Sales)	771,303	803,320	2,505,594	9,269,274	19,014,253	20,215,241	21,138,818	22,053,728	22,863,048	23,978,767	25,085,149
Net Value Added Tax (on Projects)		0	1,989,506	5,353,109	4,199,588	(1,613,444)	(7,056,448)	(2,872,312)	0	0	0
Gas Rehabilitation Fund		481,992	1,503,356	5,561,564	11,408,552	12,129,145	12,683,291	13,232,237	13,717,829	14,387,260	15,051,089
TOTAL DEDUCTIONS	**771,303**	**1,898,223**	**8,934,271**	**25,891,766**	**43,412,392**	**41,522,605**	**38,222,946**	**44,578,306**	**49,494,839**	**52,076,909**	**54,692,784**
NET INCOME BEFORE INTEREST and TAXES	**129,056**	**(394,530)**	**(7,915,080)**	**7,727,346**	**42,372,447**	**48,198,162**	**55,092,856**	**52,157,636**	**49,904,997**	**51,685,932**	**53,234,440**
INTEREST and TAXES											
Interest Expenses		0	422,041	2,100,421	4,905,456	7,319,649	8,185,147	7,844,099	7,162,003	6,479,908	5,797,812
Currency fluctuation loss on debt			0	14,234,606	14,906,140	4,194,777	2,350,207	2,079,159	1,825,852	1,705,563	1,566,004
Taxes:											
Corporate Income Tax	41,298	476,178	304,994	10,724,924	27,408,444	28,663,071	29,810,481	30,901,803	31,750,941	33,143,585	34,472,454
Excess Payroll Tax	33,267	363,006	1,534,064	2,407,820	3,097,894	3,455,818	3,668,903	3,895,419	4,135,366	4,390,559	4,661,362
Property Tax		225,807	1,604,599	2,122,094	4,199,609	6,314,200	6,715,534	7,181,828	7,517,525	7,797,610	8,135,127
Road Tax		19,280	60,134	222,463	456,342	465,166	507,332	529,289	548,713	575,490	602,044
TOTAL INTEREST and TAXES	**74,565**	**1,084,270**	**3,925,832**	**31,812,327**	**54,973,885**	**50,432,681**	**51,237,603**	**52,431,596**	**52,940,400**	**54,092,716**	**55,234,802**
NET INCOME	**54,491**	**(1,478,800)**	**(11,840,912)**	**(24,084,981)**	**(12,601,437)**	**(2,234,519)**	**3,855,253**	**(273,961)**	**(3,035,403)**	**(2,406,784)**	**(2,000,362)**
Memo: Weighted Ave Cost of Gas		8,839	25,851	83,914	154,303	159,816	165,253	171,003	177,057	183,079	189,280
Memo: Weighted Ave Sales Price of Gas		10,156	29,972	98,795	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,192	3,868	14,334	28,677	29,907	30,541	31,252	32,075	32,954	33,882
Memo: Cash Flow From Natural Gas		4,835,557	15,099,650	55,719,369	114,218,971	121,440,317	126,990,957	132,490,179	137,356,436	144,061,742	150,711,695
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	95	877	4,583	6,694	8,361	9,226	9,741	10,288	10,868	11,484	12,139
Short-Term Investments	48,377	13,633,700	43,476,911	90,130,362	150,618,097	164,909,014	192,622,637	208,880,328	222,111,010	238,107,444	255,275,618
Cash & Short Term Investments	**48,472**	13,634,577	43,481,495	90,137,056	150,626,459	164,918,240	192,632,378	208,890,617	222,121,878	238,118,928	255,287,757
Accounts receivable - Gross *(See Note C)*	**1,144,106**	13,376,875	37,977,539	124,633,373	237,158,555	250,004,413	264,199,090	278,260,629	290,636,844	306,483,526	322,141,524
Materials & equipment	**67,063**	619,105	2,616,336	4,106,521	5,283,439	5,893,877	6,257,291	6,643,612	7,052,841	7,488,071	7,949,923
Other assets	**40,905**	377,622	1,595,631	2,504,768	3,222,628	3,594,963	3,816,627	4,052,264	4,301,872	4,567,340	4,849,047
Total Current Assets	1,300,546	28,008,179	85,671,201	221,381,718	396,291,081	424,411,493	466,905,386	497,847,122	524,113,435	556,657,865	590,228,250
Fixed assets											
Adusted Cost of Fixed Assets	1,991,762	18,387,325	88,074,409	171,234,543	263,699,962	323,755,906	343,718,586	364,939,561	387,418,832	411,326,437	436,696,385
Less: Accumulated Depreciation	846,313	8,425,808	38,543,279	66,204,168	93,968,103	115,616,839	134,203,021	154,653,285	177,093,462	201,732,776	228,731,873
Net Revalued Assets	1,145,449	9,961,517	49,531,129	105,030,375	169,731,859	208,139,067	209,515,565	210,286,276	210,325,370	209,593,661	207,964,512
TOTAL ASSETS	**2,445,995**	**37,969,695**	**135,202,331**	**326,412,093**	**566,022,941**	**632,550,560**	**676,420,952**	**708,133,398**	**734,438,804**	**766,251,526**	**798,192,762**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**1,303,664**	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Total Current Liabilities	1,303,664	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Long Term Debt		0	8,440,814	33,567,602	64,541,514	81,851,468	81,851,468	75,030,512	68,209,557	61,383,601	54,567,645
Additional debt due to currency rate			0	14,234,606	29,140,745	33,335,522	35,685,729	34,617,814	32,992,283	30,972,227	28,574,871
Other Funds	**1,101,205**	10,165,981	42,961,435	67,430,951	86,756,481	96,780,138	102,747,568	109,091,140	115,810,854	122,957,538	130,541,360
Total Long Term Liabilities	1,101,205	10,165,981	51,402,249	115,233,159	180,438,740	211,967,128	220,284,766	218,739,467	217,012,694	215,318,367	213,683,877
Other Liabilities & Equity											
Net Revaluation Surplus		9,428,979	41,564,832	69,776,244	99,877,668	119,488,122	132,321,907	145,257,269	158,210,324	171,189,497	184,116,894
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,125	41,126	41,126
Retained Earnings	0	(1,478,800)	(13,319,712)	(37,404,693)	(50,006,130)	(52,240,649)	(50,313,023)	(50,586,984)	(53,622,380)	(56,029,170)	(58,029,532)
Net Equity	41,126	7,991,305	28,286,246	32,412,677	49,912,663	67,288,598	82,050,009	94,711,412	104,629,064	115,201,453	126,128,488
TOTAL LIABILITIES & EQUITY	**2,445,995**	**37,969,696**	**135,202,331**	**326,412,094**	**566,022,941**	**632,550,560**	**676,420,951**	**708,133,398**	**734,438,804**	**766,251,524**	**798,192,760**

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		(1,478,800)	(11,840,912)	(24,084,981)	(12,601,437)	(2,234,519)	3,855,253	(273,961)	(3,035,403)	(2,406,784)	(2,000,362)
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		612,911	2,935,814	5,707,818	8,789,999	10,791,864	11,457,286	12,164,652	12,913,961	13,710,881	14,556,546
Currency fluctuation loss on L/T debt			0	14,234,606	14,906,140	4,194,777	2,350,207	2,079,159	1,825,852	1,705,563	1,566,004
Changes in assets and liabilities:											
Accounts receivable		(12,232,769)	(24,600,664)	(86,655,834)	(112,525,183)	(12,845,858)	(14,194,677)	(14,061,540)	(12,376,215)	(15,846,681)	(15,657,998)
Materials and supplies		(552,042)	(1,997,232)	(1,490,185)	(1,176,918)	(610,437)	(363,414)	(386,321)	(409,228)	(435,231)	(461,852)
Other assets		(336,717)	(1,218,209)	(908,937)	(717,860)	(372,335)	(221,664)	(235,636)	(249,608)	(265,468)	(281,706)
Accounts payable		18,508,746	35,701,426	123,252,421	156,905,280	17,623,296	20,791,342	20,596,343	18,114,527	22,934,659	22,648,691
Other funds		9,064,776	32,795,454	24,469,516	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,146,685	7,583,822
Net cash provided by operations		13,586,105	31,775,677	54,524,424	72,905,550	26,570,444	29,641,764	26,226,268	23,503,599	26,543,625	27,953,144
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(1,928,759)	(7,868,863)	(12,416,147)	(12,278,663)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(8,440,814)	(25,126,789)	(30,973,912)	(17,309,954)	0	0	0	0	0
Net cash used in investing activities		0	(10,369,573)	(32,995,652)	(43,390,059)	(29,588,617)	0	0	0	0	0
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	8,440,814	25,126,789	30,973,912	17,309,954	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(6,820,956)	(6,820,956)	(6,820,956)	(6,820,956)
Loss on Currency Fluctuation		0	0	0	0	0	0	(3,147,074)	(3,451,383)	(3,725,619)	(3,963,360)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(1,927,626)	0	0	0	0
Net cash provided (used in) financing activities		0	8,440,814	25,126,789	30,973,912	17,309,954	(1,927,626)	(9,968,030)	(10,272,338)	(10,546,575)	(10,784,315)
Net increase (decrease) in cash and cash equivalents		13,586,105	29,846,918	46,655,561	60,489,403	14,291,781	27,714,138	16,258,239	13,231,261	15,997,050	17,168,829
Cash and cash equivalents–beginning		48,472	13,634,577	43,481,495	90,137,056	150,626,459	164,918,240	192,632,378	208,890,617	222,121,878	238,118,928
Cash and cash equivalents–ending		13,634,577	43,481,495	90,137,056	150,626,459	164,918,240	192,632,378	208,890,617	222,121,878	238,118,928	255,287,757

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	**1,919,208**	1,991,762	18,387,325	88,074,409	171,234,543	263,699,962	323,755,906	343,718,586	364,939,561	387,418,832	411,326,437
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,919,208	18,387,325	77,704,836	138,238,891	220,309,903	294,167,289	343,718,586	364,939,561	387,418,832	411,326,437	436,696,385
New Investments (Current Year)	**0**	0	10,369,573	32,995,652	43,390,059	29,588,617	0	0	0	0	0
Capitalized Costs	**72,537**										
Work in Progress	**17**										
Ending Value of Assets (Gross)	1,991,762	18,387,325	88,074,409	171,234,543	263,699,962	323,755,906	343,718,586	364,939,561	387,418,832	411,326,437	436,696,385
Accumulated Depreciation		846,313	8,425,808	38,543,279	66,204,168	93,963,103	115,616,839	134,203,021	154,653,285	177,093,462	201,732,776
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	**846,313**	7,812,897	35,607,466	60,496,349	85,178,104	104,824,975	122,745,734	142,488,633	164,179,501	188,021,895	214,175,326
Current Depreciation		612,911	2,935,814	5,707,818	8,789,999	10,791,864	11,457,286	12,164,652	12,913,961	13,710,881	14,556,546
Net Value of Assets	1,145,449	9,961,517	49,531,129	105,030,375	169,731,859	208,139,067	209,515,565	210,286,276	210,325,370	209,593,651	207,964,512
Accum. Revaluation Surplus		16,395,562	75,713,074	125,877,556	174,952,917	205,420,243	225,382,923	246,603,898	269,083,169	292,990,774	[illegible] 8,360,722
Accum. Reevaluated Depreciation		6,966,584	34,148,242	56,101,312	75,075,249	85,932,121	93,061,017	101,346,629	110,872,845	121,801,277	134,243,828
Net Reevaluation Surplus		9,428,979	41,564,832	69,776,244	99,877,668	119,488,122	132,321,907	145,257,269	158,210,324	171,189,497	184,116,894

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	305,375	301,081	295,902	290,184	284,106	277,731	271,138	264,419	257,620	255,981	254,320
Other	3,986,282	3,814,685	3,645,949	3,622,357	3,711,800	3,782,822	3,886,907	3,975,029	4,024,769	4,115,641	4,193,851
Total	4,291,657	4,115,766	3,941,851	3,912,541	3,995,906	4,060,553	4,158,045	4,239,448	4,282,389	4,371,622	4,448,171
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.1%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	301,100	296,866	295,902	290,184	284,106	277,731	271,138	264,419	257,620	255,981	254,320
Other	3,930,474	3,761,279	3,607,667	3,597,001	3,698,809	3,782,822	3,886,907	3,975,029	4,024,769	4,115,641	4,193,851
Total	4,231,574	4,058,145	3,903,569	3,887,185	3,982,915	4,060,553	4,158,045	4,239,448	4,282,389	4,371,622	4,448,171
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	109.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,980	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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Case – VZ – 2

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		−14.8%	−23.9%	−22.9%	−7.4%	−1.1%	1.8%	−0.1%	−1.4%	−1.1%	−1.0%
Average over Period 1998 –2002							−0.4%				
External Financing		0.0%	84.9%	80.5%	77.3%	72.9%	72.9%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993-US$ x 000)			408.00	1382.00	1893.00	1970.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			413	1,432	2,024	2,179	0	0	0	0	0
Duties on Foreign Suppliers			422,041	1,256,339	1,548,696	865,498	0	0	0	0	0
Domestic Supplier (Current-Rubles x 000)			1,506,718	6,612,524	10,867,452	11,413,165	0	0	0	0	0
Foreign Supplier (1993-US$ x 000)			3175.00	6561.00	6292.00	3233.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			3,213	6,797	6,726	3,576	0	0	0	0	0
Foreign Supplier (Current-Rubles x 000)			8,440,814	25,126,789	30,973,912	17,309,954	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		(865,889)	(8,905,098)	(18,377,163)	(3,811,439)	8,557,345	15,312,539	11,890,692	9,878,558	11,304,098	12,556,184
Less Retirements			0	0	0	0	0	(6,820,956)	(6,820,956)	(6,820,956)	(6,820,956)
Less Domestic Suppliers		0	(1,928,759)	(7,868,863)	(12,416,147)	(12,278,663)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(1,927,626)	0	0	0	0
Funds Available/(Required)		(865,889)	(10,833,858)	(26,246,026)	(16,227,586)	(3,721,318)	13,384,913	5,069,736	3,057,603	4,483,142	5,735,228
External Sources (Foreign Projects)		0	8,440,814	25,126,789	30,973,912	17,309,954	0	0	0	0	0
Accumulative Long-Term Debt			8,440,814	33,567,602	64,541,514	81,851,468	81,851,468	75,030,512	68,209,557	61,388,601	54,567,645
Retirements								6,820,956	6,820,956	6,820,956	6,820,956
Interest			422,041	2,100,421	4,905,456	7,319,649	8,185,147	7,844,099	7,162,003	6,479,908	5,797,812
Memo: Total Project		0	9,947,532	41,686,845	83,528,208	112,251,327	112,251,327	112,251,327	112,251,327	112,251,327	112,251,327
Memo: % Externally Financed		0.0%	84.9%	80.5%	77.3%	72.9%	72.9%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(1,478,800)	(13,319,712)	(37,404,693)	(50,006,130)	(52,240,649)	(50,313,023)	(50,586,984)	(53,622,386)	(56,029,170)
adjusted net income		(1,478,800)	(11,840,912)	(24,084,981)	(12,601,437)	(2,234,519)	3,855,253	(273,961)	(3,035,403)	(2,406,784)	(2,000,362)
less: dividends		0	0	0	0	0	(1,927,626)	0	0	0	0
Ending retained earnings - to B/S		(1,478,800)	(13,319,712)	(37,404,693)	(50,006,130)	(52,240,649)	(50,313,023)	(50,586,984)	(53,622,386)	(56,029,170)	(58,029,532)

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V.A.T. CALCULATIONS	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
On Project Investments											
1994 Investment											
VAT Payment			9,947,532								
VAT Recapture			1,989,506								
				(994,753)	(994,753)						
1995 Investment											
VAT Payment				31,739,312							
VAT Recapture				6,347,862							
					(3,173,931)	(3,173,931)					
1995 Investment											
VAT Payment					41,841,363						
VAT Recapture					8,368,273						
						(4,184,136)	(4,184,136)				
1996 Investment											
VAT Payment						28,723,119					
VAT Recapture						5,744,624					
							(2,872,312)	(2,872,312)			
Value Added Tax on Projects		0	1,989,506	6,347,862	8,368,273	5,744,624	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(994,753)	(4,168,684)	(7,358,068)	(7,056,448)	(2,872,312)	0	0	0
Net V.A.T. on Projects		0	1,989,506	5,353,109	4,199,588	(1,613,444)	(7,056,448)	(2,872,312)	0	0	0
On Sales											
(a) GAS & LPG Purchases		36,405,508	102,007,245	328,484,836	616,799,902	649,182,890	687,387,194	725,233,186	758,518,816	800,661,487	842,278,689
(b) Commodity = = Purchases / (1+VAT Rate)		30,337,923	85,006,038	273,737,363	513,999,916	540,985,741	572,822,661	604,360,988	632,099,013	667,217,906	701,898,908
(c) VAT Included = Line (b) – Line (b)		6,067,585	17,001,208	54,747,473	102,799,984	108,197,148	114,564,532	120,872,198	126,419,803	133,443,581	140,379,782
(d) GAS & LPG Sales		41,225,427	117,040,810	384,100,479	730,885,420	770,474,336	814,220,100	857,555,556	895,697,107	944,534,090	992,789,580
(e) Commodity = = Purchases / (1+VAT Rate)		34,354,523	97,534,008	320,083,733	609,071,183	642,061,946	678,516,750	714,629,630	746,414,256	787,111,742	827,324,650
(f) VAT Included = Line (d) – Line (e)		6,870,905	19,506,802	64,016,747	121,814,237	128,412,389	135,703,350	142,925,926	149,282,851	157,422,348	165,464,930
(g) Utility's VAT Liability = Line (f) – Line (c)		803,320	2,505,594	9,269,274	19,014,253	20,215,241	21,138,818	22,053,728	22,863,048	23,978,767	25,085,149
Test											
Margin on GAS & LPG Sales		4,819,920	15,033,565	55,815,644	114,085,518	121,291,446	126,832,906	132,322,371	137,178,291	143,872,604	150,510,891
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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Case – VZ – 2

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			33,567,602	64,541,514	81,851,468	81,851,468	75,030,512	68,209,557	61,388,601	54,567,645
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			3,805	3,237	867	472	406	347	316	282
Additional ruble debt/expense to record – in rubles			14,234,606	14,906,140	4,194,777	2,350,207	2,079,159	1,825,852	1,705,563	1,566,004
cumulative			14,234,606	29,140,745	33,335,522	35,685,729	37,764,888	39,590,740	41,296,303	42,862,307
Computation of payment on additional L/T debt – 1/12th							3,147,074	3,451,383	3,725,619	3,963,360
cumulative							3,147,074	6,598,457	10,324,076	14,287,436

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short-Term Investments	2.0%	35.9%	32.2%	27.6%	26.6%	26.1%	28.5%	29.5%	30.2%	31.1%	32.0%
Cash & Investments	2.0%	35.9%	32.2%	27.6%	26.6%	26.1%	28.5%	29.5%	30.2%	31.1%	32.0%
Accounts receivable	46.8%	35.2%	28.1%	38.2%	41.9%	39.5%	39.1%	39.3%	39.6%	40.0%	40.4%
Materials & equipment	2.7%	1.6%	1.9%	1.3%	0.9%	0.9%	0.9%	0.9%	1.0%	1.0%	1.0%
Other assets	1.7%	1.0%	1.2%	0.8%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Total Current Assets	53.2%	73.8%	63.4%	67.8%	70.0%	67.1%	69.0%	70.3%	71.4%	72.6%	73.9%
Fixed assets											
Adusted Cost of Fixed Assets	81.4%	48.4%	65.1%	52.5%	46.6%	51.2%	50.8%	51.5%	52.8%	53.7%	54.7%
Less: Accumulated Depreciation	34.6%	22.2%	28.5%	20.3%	16.6%	18.3%	19.8%	21.8%	24.1%	26.3%	28.7%
Net Revalued Assets	46.8%	26.2%	36.6%	32.2%	30.0%	32.9%	31.0%	29.7%	28.6%	27.4%	26.1%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	53.3%	52.2%	41.1%	54.8%	59.3%	55.9%	55.3%	55.7%	56.2%	56.9%	57.4%
Total Current Liabilities	53.3%	52.2%	41.1%	54.8%	59.3%	55.9%	55.3%	55.7%	56.2%	56.9%	57.4%
Long Term Debt	0.0%	0.0%	6.2%	10.3%	11.4%	12.9%	12.1%	10.6%	9.3%	8.0%	6.8%
Additional debt due to currency rate	0.0%	0.0%	0.0%	4.4%	5.1%	5.3%	5.3%	4.9%	4.5%	4.0%	3.6%
Other Funds	45.0%	26.8%	31.8%	20.7%	15.3%	15.3%	15.2%	15.4%	15.8%	16.0%	16.4%
Total Long Term Liabilities	45.0%	26.8%	38.0%	35.3%	31.9%	33.5%	32.6%	30.9%	29.5%	28.1%	26.8%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	24.8%	30.7%	21.4%	17.6%	18.9%	19.6%	20.5%	21.5%	22.3%	23.1%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	-3.9%	-9.9%	-11.5%	-8.8%	-8.3%	-7.4%	-7.1%	-7.3%	-7.3%	-7.3%
Net Equity	1.7%	21.0%	20.9%	9.9%	8.8%	10.6%	12.1%	13.4%	14.2%	15.0%	15.8%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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RATIOS	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Current assets	1,300,546	28,008,179	85,671,201	221,381,718	396,291,081	424,411,493	466,905,386	497,847,122	524,113,435	556,657,865	590,228,250
Current liabilities	1,303,664	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Working capital	(3,118)	8,195,768	30,157,365	42,615,460	60,619,543	71,116,659	92,819,210	103,164,603	111,316,388	120,926,160	131,847,854
Change in working capital		8,198,886	21,961,597	12,458,096	18,004,083	10,497,115	21,702,552	10,345,393	8,151,785	9,609,772	10,921,694
Current ratio	1.00	1.41	1.54	1.24	1.18	1.20	1.25	1.26	1.27	1.28	1.29
Capitalization Table:											
Debt	1,101,205	10,165,981	51,402,249	115,233,159	180,438,740	211,967,128	220,284,766	218,739,467	217,012,694	215,318,367	213,683,877
Equity	41,126	7,991,305	28,286,246	32,412,677	49,912,663	67,288,598	82,050,009	94,711,412	104,829,064	115,201,453	126,128,488
Percent debt	96.4%	56.0%	64.5%	78.0%	78.3%	75.9%	72.9%	69.8%	67.5%	65.1%	62.9%
Percent equity	3.6%	44.0%	35.5%	22.0%	21.7%	24.1%	27.1%	30.2%	32.5%	34.9%	37.1%
Times interest Earned:											
Net income	54,491	(1,478,800)	(11,840,912)	(24,084,981)	(12,601,437)	(2,234,519)	3,855,253	(273,961)	(3,035,403)	(2,406,784)	(2,000,362)
Add back: interest expense	0	0	422,041	2,100,421	4,905,456	7,319,649	8,185,147	7,844,099	7,162,003	6,479,908	5,797,812
depreciation	0	612,911	2,935,814	5,707,818	8,789,999	10,791,864	11,457,286	12,164,652	12,913,961	13,710,881	14,556,546
taxes	74,565	1,084,270	3,925,832	31,812,327	54,973,885	50,432,681	51,237,603	52,431,596	52,940,400	54,092,716	55,234,802
total	129,056	218,381	(4,557,226)	15,535,585	56,067,902	66,309,674	74,735,289	72,166,387	69,980,961	71,876,721	73,588,798
Interest	0	0	422,041	2,100,421	4,905,456	7,319,649	8,185,147	7,844,099	7,162,003	6,479,908	5,797,812
Time interest earned			-10.8	7.4	11.4	9.1	9.1	9.2	9.8	11.1	12.7
Operating revenue	3,525,955	41,225,427	117,040,810	384,100,479	730,885,420	770,474,336	814,220,100	857,555,556	895,697,107	944,534,090	992,789,580
Operating expenses (B4 depr, tax)	2,773,444	39,894,606	116,752,173	351,628,023	646,575,864	682,399,102	722,651,507	762,674,696	798,266,620	842,862,127	887,082,196
Operating margin	752,511	1,330,822	288,637	32,472,457	84,309,556	88,075,233	91,568,593	94,880,860	97,430,487	101,671,964	105,707,384
Percent	21.3%	3.2%	0.2%	8.5%	11.5%	11.4%	11.2%	11.1%	10.9%	10.8%	10.6%
Net income to total revenue	1.5%	-3.6%	-10.1%	-6.3%	-1.7%	-0.3%	0.5%	-0.0%	-0.3%	-0.3%	-0.2%
Return on total assets	2.2%	-3.9%	-8.8%	-7.4%	-2.2%	-0.4%	0.6%	-0.0%	-0.4%	-0.3%	-0.3%
Return on beginning equity		-3595.8%	-148.2%	-85.1%	-38.9%	-4.5%	5.7%	-0.3%	-3.2%	-2.3%	-1.7%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
Accum. Deprec. / Assets	42.5%	45.8%	43.8%	38.7%	35.6%	35.7%	39.0%	42.4%	45.7%	49.0%	52.4%
Receivables / Sales	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		13,586,105	29,846,918	46,655,561	60,489,403	14,291,781	27,714,138	16,258,239	13,231,261	15,997,050	17,168,829
Accounts receivable		12,232,769	24,600,664	86,655,834	112,525,183	12,845,858	14,194,677	14,061,540	12,376,215	15,846,681	15,657,998
Materials & equipment		552,042	1,997,232	1,490,185	1,176,918	610,437	363,414	386,321	409,228	435,231	461,852
Other assets		336,717	1,218,209	908,937	717,860	372,335	221,664	235,636	249,608	265,468	281,706
Net fixed assets		8,816,068	39,569,612	55,499,246	64,701,484	38,407,207	1,376,499	770,711	39,094	(731,709)	(1,629,149)
		35,523,701	97,232,635	191,209,763	239,610,848	66,527,618	43,870,392	31,712,447	26,305,406	31,812,721	31,941,236
Credits:											
Accounts payable		18,508,746	35,701,426	123,252,421	156,905,280	17,623,296	20,791,342	20,596,343	18,114,527	22,934,659	22,648,691
Long term debt		0	8,440,814	25,126,789	30,973,912	17,309,954	0	(6,820,956)	(6,820,956)	(6,820,956)	(6,820,956)
Currency fluctuation on L/T debt			0	14,234,606	14,906,140	4,194,777	2,350,207	(1,067,915)	(1,625,531)	(2,020,056)	(2,397,356)
Other funds		9,064,776	32,795,454	24,469,516	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,146,685	7,583,822
Equity/retained earnings		7,950,179	20,294,941	4,126,431	17,499,986	17,375,935	14,761,411	12,661,402	9,917,652	10,572,389	10,927,035
		35,523,701	97,232,635	191,209,763	239,610,848	66,527,619	43,870,391	31,712,446	26,305,405	31,812,721	31,941,236
check: net change debits and credits		0	0	0	0	1	(1)	(1)	(1)	0	0
Does balance sheet balance?		1	1	1	1	1	(0)	(1)	(1)	(2)	(2)
check: analysis of change in fixed assets		0	(0)	(0)	0	(0)	0	0	0	(0)	(0)
check: analysis of change in equity/RE		0	(0)	(0)	(0)	0	(0)	(0)	0	(0)	0
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	(0)	(0)	0	0	0	0
Analysis of change in net fixed assets:											
Revaluation write up of assets		16,395,563	59,317,511	50,164,482	49,075,360	30,467,326	19,962,680	21,220,975	22,479,270	23,907,605	25,369,948
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(21,953,070)	(18,973,937)	(10,856,872)	(7,128,895)	(8,285,612)	(9,526,216)	(10,928,433)	(12,442,551)
Current depreciation		(612,911)	(2,935,814)	(5,707,818)	(8,789,999)	(10,791,864)	(11,457,286)	(12,164,652)	(12,913,961)	(13,710,881)	(14,556,545)
New capital expenditures, net		0	10,369,573	32,995,652	43,390,059	29,588,617	0	0	0	0	0
		8,816,068	39,569,612	55,499,246	64,701,484	38,407,207	1,376,499	770,711	39,094	(731,709)	(1,629,149)
Analysis of change in net equity/RE											
Net income		(1,478,800)	(11,840,912)	(24,084,981)	(12,601,437)	(2,234,515)	3,855,253	(273,961)	(3,035,403)	(2,406,784)	(2,000,362)
Revaluation surplus (direct cr. to equity)		16,395,563	59,317,511	50,164,482	49,075,360	30,467,326	19,962,680	21,220,975	22,479,270	23,907,605	25,369,948
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(21,953,070)	(18,973,937)	(10,856,872)	(7,128,895)	(8,285,612)	(9,526,216)	(10,928,433)	(12,442,551)
Dividends declared		0	0	0	0	0	(1,927,626)	0	0	0	0
		7,950,179	20,294,941	4,126,431	17,499,986	17,375,935	14,761,411	12,661,402	9,917,652	10,572,389	10,927,035
Analysis of change in long term debt:											
New debt issued		0	8,440,814	25,126,789	30,973,912	17,309,954	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(6,820,956)	(6,820,956)	(6,820,956)	(6,820,956)
		0	8,440,814	25,126,789	30,973,912	17,309,954	0	(6,820,956)	(6,820,956)	(6,820,956)	(6,820,956)

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INCOME STATEMENT

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		593,732	3,584,852	21,295,443	52,128,905	52,691,959	53,087,194	53,480,065	53,876,586	55,300,343	56,754,560
Natural Gas, Other		40,621,818	113,414,213	362,739,516	678,672,216	717,688,338	761,033,069	803,969,490	841,707,991	889,114,272	935,908,177
Natural Gas, Total		41,215,549	116,999,066	384,034,959	730,801,121	770,380,297	814,120,263	857,449,555	895,584,576	944,414,616	992,662,737
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,525,955	41,225,427	117,040,810	384,100,479	730,885,420	770,474,336	814,220,100	857,555,556	895,697,107	944,534,090	992,789,580
Other Revenues	19,101	157,233	664,469	1,042,930	1,341,830	1,496,863	1,589,159	1,687,272	1,791,204	1,901,739	2,019,035
TOTAL OPERATING INCOME	**3,545,056**	**41,382,661**	**117,705,279**	**385,143,409**	**732,227,250**	**771,971,198**	**815,809,259**	**859,242,829**	**897,488,311**	**946,435,829**	**994,808,615**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		216,778	1,290,547	7,666,359	18,766,406	18,969,105	19,111,390	19,252,823	19,395,571	19,908,124	20,431,642
Natural Gas, Other		36,163,214	100,608,869	320,649,230	597,815,744	629,970,875	668,017,916	705,706,553	738,832,569	780,444,750	821,519,400
Natural Gas, Total		36,379,992	101,899,416	328,315,590	616,582,150	648,939,980	687,129,306	724,959,376	758,228,140	800,352,874	841,951,041
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,395,496	36,405,508	102,007,245	328,484,836	616,799,902	649,182,890	687,387,194	725,233,186	758,518,816	800,661,487	842,278,689
Payroll (Wages & Bonus)	201,650	1,861,570	7,866,994	12,347,793	15,886,637	17,722,145	18,814,887	19,976,506	21,207,004	22,515,687	23,904,419
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	176,298	1,627,528	6,877,934	10,795,394	13,889,325	15,494,068	16,449,427	17,465,004	18,540,800	19,684,952	20,899,088
TOTAL OPERATING EXPENSES	**2,773,444**	**39,894,606**	**116,752,173**	**351,628,023**	**646,575,864**	**682,399,102**	**722,651,507**	**762,674,696**	**798,266,620**	**842,862,127**	**887,082,196**
EARNINGS BEFORE TAXES, SUSBSIDIES AND DEPRECIATION	**771,612**	**1,488,055**	**953,105**	**33,515,386**	**85,651,387**	**89,572,096**	**93,157,752**	**96,568,133**	**99,221,691**	**103,573,702**	**107,726,419**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	128,747	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	**128,747**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		612,911	3,137,392	6,796,216	11,705,565	14,988,153	15,912,317	16,894,734	17,935,403	19,042,196	20,216,688
Value Added Tax (on Sales)	771,303	803,320	2,505 594	9,269,274	19,014,253	20,215,241	21,138,818	22,053,728	22,863,048	23,978,767	25,085,149
Net Value Added Tax (on Projects)		0	3,144,821	9,232,741	10,209,972	(2,724,631)	(14,227,691)	(5,635,212)	0	0	0
Gas Rehabilitation Fund		481,992	1,503,356	5,561,564	11,408,552	12,129,145	12,683,291	13,232,237	13,717,829	14,387,260	15,051,089
TOTAL DEDUCTIONS	**771,303**	**1,898,223**	**10,291,164**	**30,859,795**	**52,338,342**	**44,607,907**	**35,506,735**	**46,545,486**	**54,516,281**	**57,408,224**	**60,352,926**
NET INCOME BEFORE INTEREST and TAXES	**129,056**	**(394,530)**	**(9,271,973)**	**2,759,316**	**33,446,497**	**45,113,060**	**57,809,068**	**50,190,454**	**44,883,555**	**46,354,617**	**47,574,298**
INTEREST and TAXES											
Interest Expenses		0	692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,203	12,771,016	11,554,729	10,338,442
Currency fluctuation loss on debt			0	23,941,469	26,537,982	7,479,968	4,190 802	3,707,478	3,255,790	3,041,297	2,792,439
Taxes:											
Corporate Income Tax	41,298	476,178	304,994	10,724,924	27,408,444	28,663,071	29,810,481	30,901,803	31,750,941	33,143,585	34,472,454
Excess Payroll Tax	33,267	363,006	1,534,064	2,407,820	3,097,894	3,455,818	3,668,903	3,895,419	4,135,366	4,390,559	4,661,362
Property Tax		225,807	1,604,599	2,181,546	4,433,121	6,780,010	7,307,739	7,825,253	8,064,463	8,221,472	8,439,023
Road Tax		19,280	60,134	222,463	456,342	485,166	507,332	529,289	548,713	575,490	602,044
TOTAL INTEREST and TAXES	**74,565**	**1,084,270**	**4,196,603**	**42,993,934**	**70,501,973**	**59,907,046**	**60,080,703**	**60,846,545**	**60,526,290**	**60,927,132**	**61,305,763**
NET INCOME	**54,491**	**(1,478,800)**	**(13,468,576)**	**(40,234,617)**	**(37,055,476)**	**(14,793,986)**	**(2,271,636)**	**(10,656,091)**	**(15,642,735)**	**(14,572,515)**	**(13,731,465)**
Memo: Weighted Ave Cost of Gas		8,839	25,851	83,914	154,303	159,816	165,253	171,003	177,057	183,079	189,280
Memo: Weighted Ave Sales Price of Gas		10,156	29,972	98,795	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,192	3,868	14,334	28,677	29,907	30,541	31,252	32,075	32,954	33,882
Memo: Cash Flow From Natural Gas		4,835,557	15,090,650	55,719,369	114,218,971	121,440,317	126,990,957	132,490,179	137,356,436	144,061,742	150,711,695
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET

(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	95	877	4,583	6,694	8,361	9,226	9,741	10,288	10,868	11,484	12,139
Short–Term Investments	48,377	13,633,700	41,418,894	77,032,781	109,630,607	104,266,341	134,076,328	138,627,305	137,780,728	140,142,400	144,143,780
Cash & Short Term investments	**48,472**	13,634,577	41,423,478	77,039,476	109,638,969	104,275,567	134,086,069	138,637,594	137,791,596	140,153,884	144,155,919
Accounts receivable – Gross *(See Note C.)*	**1,144,106**	13,376,875	37,977,539	124,633,373	237,158,555	250,004,413	264,199,090	278,260,629	290,636,844	306,482,526	322,141,524
Materials & equipment	**67,063**	61[illegible]	2,616,336	4,106,521	5,283,439	5,893,877	6,257,291	6,643,612	7,052,841	7,488,071	7,949,923
Other assets	**40,905**	37[illegible],22	1,595,831	2,504,768	3,222,628	3,594,963	3,816,627	4,052,264	4,301,872	4,567,340	4,849,047
Total Current Assets	1,300,546	28,008,179	83,613,184	208,284,138	355,303,531	363,768,820	408,359,077	427,594,099	439,783,153	458,692,822	479,096,412
Fixed assets											
Adusted Cost of Fixed Assets	1,991,762	18,387,325	94,121,753	203,886,467	351,166,959	449,644,588	477,369,522	506,842,024	538,062,095	571,265,892	606,500,646
Less: Accumulated Depreciation	846,313	8,425,608	38,744,858	67,608,956	98,691,067	125,081,773	148,706,590	174,782,379	203,493,894	235,083,076	269,799,307
Net Revalued Assets	1,145,449	9,961,517	55,376,896	136,277,511	252,475,893	324,562,815	328,662,932	332,059,646	334,578,201	336,182,816	336,701,339
TOTAL ASSETS	**2,445,995**	**37,969,695**	**138,990,080**	**344,561,648**	**607,779,484**	**688,331,635**	**737,022,009**	**759,653,745**	**774,361,354**	**794,875,638**	**815,797,751**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**1,303,664**	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Total Current Liabilities	1,303,664	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Long Term Debt		0	13,856,227	56,458,025	114,905,777	145,954,469	145,954,469	133,791,597	121,628,724	109,465,852	97,302,980
Additional debt due to currency rate			0	23,941,469	50,479,452	57,959,420	62,150,222	60,369,558	57,594,575	54,116,090	49,964,817
Other Funds	**1,101,205**	10,165,981	42,961,435	67,430,951	86,756,481	96,780,138	102,747,568	109,091,140	115,810,854	122,957,538	130,541,360
Total Long Term Liabilities	1,101,205	10,165,981	56,817,662	147,830,446	252,141,709	300,094,027	310,852,260	303,252,295	295,034,153	286,539,480	277,809,157
Other Liabilities & Equity											
Net Revaluation Surplus		9,428,979	41,564,832	73,105,813	112,162,582	141,333,104	161,345,538	181,636,986	202,090,944	222,737,756	243,472,967
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126
Retained Earnings	0	(1,478,800)	(14,947,376)	(55,181,993)	(92,237,469)	(107,031,455)	(109,303,090)	(119,959,182)	(135,601,917)	(150,174,431)	(163,905,896)
Net Equity	41,126	7,991,305	26,658,582	17,964,946	19,966,239	34,342,775	52,083,573	61,718,930	66,530,154	72,604,451	79,608,197
TOTAL LIABILITIES & EQUITY	**2,445,995**	**37,969,696**	**138,990,081**	**344,561,650**	**607,779,486**	**688,331,636**	**737,022,009**	**759,653,745**	**774,361,354**	**794,875,636**	**815,797,749**

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		(1,478,800)	(13,468,576)	(40,234,617)	(37,055,476)	(14,793,986)	(2,271,636)	(10,656,091)	(15,642,735)	(14,572,515)	(13,731,465)
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		612,911	3,137,392	6,796,216	11,705,565	14,988,153	15,912,317	16,894,734	17,935,403	19,042,196	20,216,688
Currency fluctuation loss on L/T debt			0	23,941,469	26,537,982	7,479,968	4,190,802	3,707,478	3,255,790	3,041,297	2,792,439
Changes in assets and liabilities:											
Accounts receivable		(12,232,769)	(24,600,664)	(86,655,834)	(112,525,183)	(12,845,858)	(14,194,677)	(14,061,540)	(12,376,215)	(15,846,681)	(15,657,998)
Materials and supplies		(552,042)	(1,997,232)	(1,490,185)	(1,176,918)	(610,437)	(363,414)	(386,321)	(409,228)	(435,231)	(461,852)
Other assets		(336,717)	(1,218,209)	(908,937)	(717,860)	(372,335)	(221,664)	(235,636)	(249,608)	(265,468)	(281,706)
Accounts payable		18,508,746	35,701,426	123,252,421	156,905,280	17,623,296	20,791,342	20,596,343	18,114,527	22,934,659	22,648,691
Other funds		9,064,776	32,795,454	24,469,516	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,146,685	7,583,822
Net cash provided by operations		**13,586,105**	**30,349,591**	**49,170,049**	**62,998,920**	**21,492,458**	**29,810,502**	**22,202,539**	**17,347,648**	**21,044,942**	**23,108,619**
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(2,560,690)	(12,554,051)	(30,399,427)	(26,855,861)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(13,856,227)	(42,601,798)	(58,447,751)	(31,048,693)	0	0	0	0	0
Net cash used in investing activities		**0**	**(16,416,917)**	**(56,155,849)**	**(88,847,179)**	**(57,904,554)**	**0**	**0**	**0**	**0**	**0**
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
Loss on Currency Fluctuation		0	0	0	0	0	0	(5,488,142)	(6,030,773)	(6,519,782)	(6,943,712)
Principal payments on interim debt											
Dividends		0	0	0	0	0	0	0	0	0	0
Net cash provided (used in) financing activities		**0**	**13,856,227**	**42,601,798**	**58,447,751**	**31,048,693**	**0**	**(17,651,014)**	**(18,193,646)**	**(18,682,654)**	**(19,106,584)**
Net increase (decrease) in cash and cash equivalents		13,586,105	27,788,901	35,615,998	32,599,493	(5,363,402)	29,810,502	4,551,525	(845,998)	2,362,288	4,002,035
Cash and cash equivalents–beginning		48,472	13,634,577	41,423,478	77,039,476	109,638,969	104,275,567	134,086,069	138,637,594	137,791,596	140,153,884
Cash and cash equivalents–ending		13,634,577	41,423,478	77,039,476	109,638,969	104,275,567	134,086,069	138,637,594	137,791,596	140,153,884	144,155,919

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	**1,919,208**	1,991,762	18,387,325	94,121,753	203,886,467	351,166,959	449,644,588	477,369,522	506,842,024	538,062,095	571,265,892
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,919,208	18,387,325	77,704,836	147,730,617	262,319,781	391,740,034	477,369,522	506,842,024	538,062,095	571,265,892	606,500,646
New Investments (Current Year)	**0**	0	16,416,917	56,155,849	88,847,179	57,904,554	0	0	0	0	0
Capitalized Costs	**72,537**										
Work in Progress	**17**										
Ending Value of Assets (Gross)	1,991,762	18,387,325	94,121,753	203,886,467	351,166,959	449,644,588	477,369,522	506,842,024	538,062,095	571,265,892	606,500,646
Accumulated Depreciation		846,313	8,425,808	38,744,858	67,608,956	98,691,067	125,081,773	148,706,590	174,782,379	203,485,894	235,083,076
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	**846,313**	7,812,897	35,607,466	60,812,740	86,985,501	110,093,620	132,794,273	157,887,644	185,548,491	216,040,880	249,582,619
Current Depreciation		612,911	3,137,392	6,796,216	11,705,565	14,988,153	15,912,317	16,894,734	17,935,403	19,042,196	20,216,688
Net Value of Assets	1,145,449	9,961,517	55,376,896	136,277,511	252,475,893	324,562,815	328,662,932	332,059,646	334,578,201	336,182,816	336,701,339
Accum. Revaluation Surplus		16,395,563	75,713,074	129,321,938	187,755,252	228,328,327	256,053,261	285,525,764	316,745,834	349,949,631	385,184,386
Accum. Reevaluated Depreciation		6,966,584	34 148,242	56,216,125	75,592,670	86,995,224	94,707,724	103,888,778	114,654,890	127,211,875	141,711,419
Net Reevaluation Surplus		9,428,979	41,564,832	73,105,813	112,162,582	141,333,104	161,345,538	181,636,986	202,090,944	222,737,756	243,472,967

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	305,375	301,081	295,902	290,184	284,106	277,731	271,138	264,419	257,620	255,981	254,320
Other	3,986,282	3,814,685	3,645,949	3,622,357	3,711,800	3,782,822	3,886,907	3,975,029	4,024,769	4,115,641	4,193,851
Total	4,291,657	4,115,766	3,941,851	3,912,541	3,995,906	4,060,553	4,158,045	4,239,448	4,282,389	4,371,622	4,448,171
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.1%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	301,100	296,866	295,902	290,184	284,106	277,731	271,138	264,419	257,620	255,981	254,320
Other	3,930,474	3,761,279	3,607,667	3,597,001	3,698,809	3,782,822	3,886,907	3,975,029	4,024,769	4,115,641	4,193,851
Total	4,231,574	4,058,145	3,903,569	3,887,185	3,982,915	4,060,553	4,158,045	4,239,448	4,282,389	4,371,622	4,448,171
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%	−1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,986	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	259,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.1%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,980	5,118	5,255	5,401	5,550
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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Gas Cost Calculation	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		−14.8%	−24.3%	−29.5%	−14.7%	−4.6%	−0.7%	−3.2%	−4.7%	−4.3%	−4.1%
Average over Period 1998–2002							−3.4%				
External Financing		0.0%	88.1%	80.9%	73.8%	68.8%	68.8%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993-US$ x 000)			442.00	2398.00	4988.00	4436.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			447	2,484	5,332	4,906	0	0	0	0	0
Duties on Foreign Suppliers			692,811	2,130,090	2,922,388	1,552,435	0	0	0	0	0
Domestic Supplier (Current-Rubles x 000)			1,867,879	11,423,961	27,477,040	25,303,426	0	0	0	0	0
Foreign Supplier (1993-US$ x 000)			5212.00	11124.00	11873.00	5799.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current - Int'l Inflation			5,275	11,524	12,692	6,414	0	0	0	0	0
Foreign Supplier (Current-Rubles x 000)			13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		(865,889)	(10,331,184)	(33,438,402)	(25,349,911)	194,167	13,640,682	6,238,643	2,292,668	4,469,682	6,485,223
Less Retirements			0	0	0	0	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
Less Domestic Suppliers		0	(2,560,690)	(13,554,051)	(30,399,427)	(26,855,861)	0	0	0	0	0
Less Dividends		0	0	0	0	0	0	0	0	0	0
Funds Available/(Required)		(865,889)	(12,891,874)	(46,992,453)	(55,749,338)	(26,661,694)	13,640,682	(5,924,230)	(9,870,204)	(7,693,191)	(5,677,649)
External Sources (Foreign Projects)		0	13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Accumulative Long-Term Debt			13,856,227	56,458,025	114,905,777	145,954,469	145,954,469	133,791,597	121,628,724	109,465,852	97,302,980
Retirements								12,162,872	12,162,872	12,162,872	12,162,872
Interest			692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,303	12,771,016	11,554,729	10,338,442
Memo: Total Project		0	15,724,106	69,749,865	155,674,656	212,026,775	212,026,775	212,026,775	212,026,775	212,026,775	212,026,775
Memo: % Externally Financed		0.0%	88.1%	80.9%	73.8%	68.8%	68.8%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(1,478,800)	(14,947,376)	(55,181,993)	(92,237,469)	(107,031,455)	(109,303,090)	(119,959,182)	(135,601,917)	(150,174,431)
adjusted net income		(1,478,800)	(13,468,576)	(40,234,617)	(37,055,476)	(14,793,986)	(2,271,636)	(10,656,091)	(15,642,735)	(14,572,515)	(13,731,465)
less: dividends		0	0	0	0	0	0	0	0	0	0
Ending retained earnings - to B/S		(1,478,800)	(14,947,376)	(55,181,993)	(92,237,469)	(107,031,455)	(109,303,090)	(119,959,182)	(135,501,917)	(150,174,431)	(163,905,896)

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment											
VAT Payment			15,724,106								
VAT Recapture			3,144,821								
				(1,572,411)	(1,572,411)						
1995 Investment											
VAT Payment				54,025,759							
VAT Recapture				10,805,152							
					(5,402,576)	(5,402,576)					
1995 Investment											
VAT Payment					85,924,791						
VAT Recapture					17,184,958						
						(8,592,479)	(8,592,479)				
1996 Investment											
VAT Payment						56,352,119					
VAT Recapture						11,270,424					
							(5,635,212)	(5,635,212)			
Value Added Tax on Projects		0	3,144,821	10,805,152	17,184,958	11,270,424	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,572,411)	(6,974,987)	(13,995,055)	(14,227,691)	(5,635,212)	0	0	0
Net V.A.T. on Projects		0	3,144,821	9,232,741	10,209,972	(2,724,631)	(14,227,691)	(5,635,212)	0	0	0
On Sales											
(a) GAS & LPG Purchases		36,405,508	102,007,245	328,484,836	616,799,902	649,182,890	687,387,194	725,233,186	758,518,816	800,661,487	842,278,689
(b) Commodity = = Purchases / (1+VAT Rate)		30,337,923	85,006,038	273,737,363	513,999,918	540,985,741	572,822,661	604,360,988	632,099,013	667,217,906	701,898,908
(c) VAT Included = Line (b) – Line (b)		6,067,585	17,001,208	54,747,473	102,799,984	108,197,148	114,564,532	120,872,198	126,419,803	133,443,581	140,379,782
(d) GAS & LPG Sales		41,225,427	117,040,810	384,100,479	730,885,420	770,474,336	814,220,100	857,555,556	895,697,107	944,534,090	992,789,580
(e) Commodity = = Purchases / (1+VAT Rate)		34,354,523	97,534,008	320,083,733	609,071,183	642,061,946	678,516,750	714,629,630	746,414,256	787,111,742	827,324,650
(f) VAT Included = Line (d) – Line (e)		6,870,905	19,506,802	64,016,747	121,814,237	128,412,389	135,703,350	142,925,926	149,282,851	157,422,348	165,464,930
(g) Utility's VAT Liability = Line (f) – Line (c)		803,320	2,505,594	9,269,274	19,014,253	20,215,241	21,138,818	22,053,728	22,863,048	23,978,767	25,085,149
Test											
Margin on GAS & LPG Sales		4,819,920	15,033,565	55,615,644	114,085,518	121,291,446	126,832,906	132,322,371	137,178,291	143,872,604	150,510,891
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			56,458,025	114,905,777	145,954,469	145,954,469	133,791,597	121,628,724	109,465,852	97,302,980
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			6,400	5,763	1,545	842	724	620	563	503
Additional ruble debt/expense to record – in rubles			23,941,469	26,537,982	7,479,968	4,190,802	3,707,478	3,255,790	3,041,297	2,792,439
cumulative			23,941,469	50,479,452	57,959,420	62,150,222	65,857,700	69,113,490	72,154,787	74,947,226
Computation of payment on additional L/T debt – 1/12th							5,488,142	6,030,773	6,519,782	6,943,712
cumulative							5,488,142	11,518,915	18,038,697	24,982,409

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short – Term Investments	2.0%	35.9%	29.8%	22.4%	18.0%	15.1%	18.2%	18.2%	17.8%	17.6%	17.7%
Cash & Investments	2.0%	35.9%	29.8%	22.4%	18.0%	15.1%	18.2%	18.3%	17.8%	17.6%	17.7%
Accounts receivable	46.8%	35.2%	27.3%	36.2%	39.0%	36.3%	35.8%	36.6%	37.5%	38.6%	39.5%
Materials & equipment	2.7%	1.6%	1.9%	1.2%	0.9%	0.9%	0.8%	0.9%	0.9%	0.9%	1.0%
Other assets	1.7%	1.0%	1.1%	0.7%	0.5%	0.5%	0.5%	0.5%	0.6%	0.6%	0.6%
Total Current Assets	53.2%	73.8%	60.2%	60.4%	58.5%	52.8%	55.4%	56.3%	56.8%	57.7%	58.7%
Fixed assets											
Adusted Cost of Fixed Assets	81.4%	48.4%	67.7%	59.2%	57.8%	65.3%	64.8%	66.7%	69.5%	71.9%	74.3%
Less: Accumulated Depreciation	34.6%	22.2%	27.9%	19.6%	16.2%	18.2%	20.2%	23.0%	26.3%	29.6%	33.1%
Net Revalued Assets	46.8%	26.2%	39.8%	39.6%	41.5%	47.2%	44.6%	43.7%	43.2%	42.3%	41.3%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	53.3%	52.2%	39.9%	51.9%	55.2%	51.3%	50.8%	52.0%	53.3%	54.8%	56.2%
Total Current Liabilities	53.3%	52.2%	39.9%	51.9%	55.2%	51.3%	50.8%	52.0%	53.3%	54.8%	56.2%
Long Term Debt	0.0%	0.0%	10.0%	16.4%	18.9%	21.2%	19.8%	17.6%	15.7%	13.8%	11.9%
Additional debt due to currency rate	0.0%	0.0%	0.0%	6.9%	8.3%	8.4%	8.4%	7.9%	7.4%	6.8%	6.1%
Other Funds	45.0%	26.6%	30.9%	19.6%	14.3%	14.1%	13.9%	14.4%	15.0%	15.5%	16.0%
Total Long Term Liabilities	45.0%	26.8%	40.9%	42.9%	41.5%	43.7%	42.2%	39.9%	38.1%	36.0%	34.1%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	24.8%	29.9%	21.2%	18.5%	20.5%	21.9%	23.9%	26.1%	28.0%	29.8%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	−3.9%	−10.8%	−16.0%	−15.2%	−15.5%	−14.8%	−15.8%	−17.5%	−18.9%	−20.1%
Net Equity	1.7%	21.0%	19.2%	5.2%	3.3%	5.0%	7.1%	8.1%	8.6%	9.1%	9.8%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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RATIOS	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Current assets	1,300,546	28,008,179	83,613,184	208,284,138	355,303,591	363,768,820	408,359,077	427,594,099	439,783,153	458,692,822	479,096,412
Current liabilities	1,303,664	19,812,410	55,513,837	178,766,258	335,671,538	353,294,834	374,086,176	394,682,519	412,797,046	435,731,705	458,380,396
Working capital	(3,118)	8,195,768	28,099,348	29,517,880	19,632,053	10,473,985	34,272,901	32,911,580	26,986,106	22,961,117	20,716,016
Change in working capital		8,198,886	19,903,580	1,418,532	(9,885,827)	(9,158,068)	23,798,916	(1,361,321)	(5,925,474)	(4,024,990)	(2,245,100)
Current ratio	1.00	1.41	1.51	1.17	1.06	1.03	1.09	1.08	1.07	1.05	1.05
Capitalization Table:											
Debt	1,101,205	10,165,981	56,817,662	147,830,446	252,141,709	300,694,027	310,852,260	303,252,295	295,034,153	286,539,480	277,809,157
Equity	41,126	7,991,305	26,658,582	17,964,946	19,966,239	34,342,775	52,083,573	61,718,930	66,530,154	72,604,451	79,608,197
Percent debt	96.4%	56.0%	68.1%	89.2%	92.7%	89.7%	85.6%	83.1%	81.6%	79.8%	77.7%
Percent equity	3.6%	44.0%	31.9%	10.8%	7.3%	10.3%	14.4%	16.9%	18.4%	20.2%	22.3%
Times Interest Earned:											
Net income	54,491	(1,478,800)	(13,468,576)	(40,234,617)	(37,055,476)	(14,793,986)	(2,271,636)	(10,656,091)	(15,642,735)	(14,572,515)	(13,731,465)
Add back: interest expense	0	0	692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,303	12,771,016	11,554,729	10,338,442
depreciation	0	612,911	3,137,392	6,796,216	11,705,565	14,988,153	15,912,317	16,894,734	17,935,403	19,042,196	20,216,688
taxes	74,565	1,084,270	4,196,603	42,993,934	70,501,973	59,907,046	60,080,703	60,846,545	60,526,290	60,927,132	61,305,763
total	129,056	218,381	(5,441,770)	13,071,244	53,720,253	73,144,225	88,316,832	81,072,491	75,589,974	76,951,542	78,129,427
Interest	0	0	692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,303	12,771,016	11,554,729	10,338,442
Time interest earned			−7.9	3.7	6.3	5.6	6.1	5.8	5.9	6.7	7.6
Operating revenue	3,525,955	41,225,427	117,040,810	384,100,479	730,885,420	770,474,336	814,220,100	857,555,556	895,697,107	944,534,090	992,789,580
Operating expenses (B4 depr, tax)	2,773,444	39,894,606	116,752,173	351,628,023	646,575,864	682,399,102	722,651,507	762,674,696	798,266,620	842,862,127	887,082,196
Operating margin	752,511	1,330,822	288,637	32,472,457	84,309,556	88,075,233	91,568,593	94,880,860	97,430,487	101,671,964	105,707,384
Percent	21.3%	3.2%	0.2%	8.5%	11.5%	11.4%	11.2%	11.1%	10.9%	10.8%	10.6%
Net income to total revenue	1.5%	−3.6%	−11.4%	−10.4%	−5.1%	−1.9%	−0.3%	−1.2%	−1.7%	−1.5%	−1.4%
Return on total assets	2.2%	−3.9%	−9.7%	−11.7%	−6.1%	−2.1%	−0.3%	−1.4%	−2.0%	−1.8%	−1.7%
Return on beginning equity		−3595.8%	−168.5%	−150.9%	−206.3%	−74.1%	−6.6%	−20.5%	−25.3%	−21.9%	−18.9%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Accum. Deprec. / Assets	42.5%	45.8%	41.2%	33.2%	28.1%	27.8%	31.2%	34.5%	37.8%	41.2%	44.5%
Receivables / Sales	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		12,586,105	27,788,901	35,615,998	32,599,493	(5,363,402)	29,810,502	4,551,525	(845,998)	2,362,288	4,002,034
Accounts receivable		12,232,769	24,600,664	86,655,834	112,525,183	12,845,858	14,194,677	14,061,540	12,376,215	15,846,681	15,657,998
Materials & equipment		552,042	1,997,232	1,490,185	1,176,918	610,437	363,414	386,321	409,228	435,231	461,852
Other assets		336,717	1,218,209	908,937	717,860	372,335	221,664	235,636	249,608	265,468	281,706
Net fixed assets		8,816,068	45,415,379	80,900,615	116,198,382	72,086,922	4,100,117	3,396,714	2,518,555	1,604,615	518,523
		35,523,701	101,020,385	205,571,569	263,217,836	80,552,150	48,690,374	22,631,736	14,707,608	20,514,283	20,922,113
Credits:											
Accounts payable		18,508,746	35,701,426	123,252,421	156,905,280	17,623,296	20,791,342	20,596,343	18,114,527	22,934,659	22,648,691
Long term debt		0	13,856,227	42,601,798	58,447,751	31,048,693	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
Currency fluctuation on L/T debt			0	23,941,469	26,537,982	7,479,968	4,190,802	(1,780,664)	(2,774,983)	(3,478,485)	(4,151,273)
Other funds		9,064,776	32,795,454	24,469,516	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,146,685	7,583,822
Equity/retained earnings		7,950,179	18,667,277	(8,693,636)	2,001,293	14,376,536	17,740,799	9,635,357	4,811,224	6,074,297	7,003,746
		35,523,701	101,020,384	205,571,568	263,217,836	80,552,150	48,690,374	22,631,736	14,707,609	20,514,284	20,922,114
check: net change debits and credits		0	(1)	(1)	0	0	0	0	1	1	1
Does balance sheet balance?		1	1	1	2	2	0	(0)	(0)	(2)	(2)
check: analysis of change in fixed assets		0	0	(0)	(0)	(0)	0	(0)	(0)	0	(0)
check: analysis of change in equity/RE		0	(0)	(0)	0	0	0	0	0	0	(0)
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	(0)	(0)	0	(0)	0	0	0	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		16,395,563	59,317,511	53,608,864	58,433,314	40,573,075	27,724,934	29,472,502	31,220,071	33,203,797	35,234,754
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(22,067,883)	(19,376,545)	(11,402,554)	(7,712,500)	(9,181,054)	(10,766,112)	(12,556,985)	(14,499,543)
Current depreciation		(612,911)	(3,137,392)	(6,796,216)	(11,705,565)	(14,988,153)	(15,912,317)	(16,894,734)	(17,935,403)	(19,042,196)	(20,216,688)
New capital expenditures, net		0	16,416,917	56,155,849	88,847,179	57,904,554	0	0	0	0	0
		8,816,068	45,415,379	80,900,615	116,198,382	72,086,922	4,100,117	3,396,714	2,518,555	1,604,615	518,523
Analysis of change in net equity/RE											
Net income		(1,478,800)	(13,468,576)	(40,234,617)	(37,055,476)	(14,793,986)	(2,271,636)	(10,656,091)	(15,642,735)	(14,572,515)	(13,731,465)
Revaluation surplus (direct cr. to equity)		16,395,563	59,317,511	53,608,864	58,433,314	40,573,075	27,724,934	29,472,502	31,220,071	33,203,797	35,234,754
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(22,067,883)	(19,376,545)	(11,402,554)	(7,712,500)	(9,181,054)	(10,766,112)	(12,556,985)	(14,499,543)
Dividends declared		0	0	0	0	0	0	0	0	0	0
		7,950,179	18,667,277	(8,693,636)	2,001,293	14,376,536	17,740,799	9,635,357	4,811,224	6,074,297	7,003,746
Analysis of change in long term debt:											
New debt issued		0	13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
		0	13,856,227	42,601,798	58,447,751	31,048,693	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)

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INCOME STATEMENT
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note A)										
OPERATING INCOME											
Sales Revenues											
Natural Gas, Residential		593,732	3,584,853	22,643,250	58,670,293	62,530,045	66,201,084	69,866,765	70,255,386	71,570,221	72,890,735
Natural Gas, Other		40,621,818	113,414 213	358,600,867	670,057,441	707,773,225	749,866,742	791,596,339	829,183,912	876,209,973	922,622,227
Natural Gas, Total		41,215,549	116,999,066	381,244,118	728,727,734	770,303,269	816,067,826	861,463,103	899,439,297	947,780,194	995,512,962
LPG Revenue		9,878	41,745	65,521	84,299	94,039	99,837	106,001	112,530	119,475	126,844
Total Sales Revenues	3,525,955	41,225,427	117,040,810	381,309,639	728,812,033	770,397,308	816,167,663	861,569,105	899,551,828	947,899,668	995,639,805
Other Revenues	19,101	157,233	664,469	1,042,930	1,341,830	1,496,863	1,589,159	1,687,272	1,791,204	1,901,739	2,019,035
TOTAL OPERATING INCOME	**3,545,056**	**41,382,661**	**117,705,279**	**382,352,568**	**730,153,864**	**771,894,171**	**817,756,822**	**863,256,377**	**901,343,032**	**949,801,407**	**997,658,840**
OPERATING EXPENSES											
Gas Purchases											
Natural Gas, Residential		216,778	1,290,547	8,151,570	21,121,306	22,510,816	23,832,390	25,152,035	25,291,939	25,765,279	26,240,664
Natural Gas, Other		36,163,214	100,608,869	316,990,808	590,227,327	621,267,608	658,216,362	694,845,675	727,839,211	769,117,643	809,857,288
Natural Gas, Total		36,379,992	101,899,416	325,142,378	611,348,633	643,778,424	682,048,752	719,997,710	753,131,150	794,882,922	836,097,953
LPG Purchases		25,516	107,830	169,246	217,751	242,910	257,888	273,810	290,675	308,613	327,648
Cost of Gas and LPG	2,395,496	36,405,508	102,007,245	325,311,624	611,566,384	644,021,334	682,306,640	720,271,520	753,421,826	795,191,535	836,425,601
Payroll (Wages & Bonus)	201,650	1,861,570	7,866,994	12,347,793	15,886,637	17,722,145	18,814,887	19,976,506	21,207,004	22,515,687	23,904,419
Employee Benefits (Consumption)		0	0	0	0	0	0	0	0	0	0
Production Costs	176,298	1,627,528	6,877,934	10,795,394	13,889,325	15,494,068	16,449,427	17,465,004	18,540,800	19,684,952	20,899,088
TOTAL OPERATING EXPENSES	**2,773,444**	**39,894,606**	**116,752,173**	**348,454,811**	**641,342,346**	**677,237,547**	**717,570,953**	**757,713,030**	**793,169,630**	**837,392,175**	**881,229,108**
EARNINGS BEFORE TAXES, SUSBSIDIES AND DEPRECIATION	**771,612**	**1,488,055**	**953,105**	**33,897,757**	**88,811,518**	**94,656,624**	**100,185,868**	**105,543,347**	**108,173,402**	**112,409,232**	**116,429,733**

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
INCOME STATEMENT (Cont'd.)											
NON–OPERATING INCOME											
Subsidies for Losses on LPG	128,747	15,638	66,085	103,725	133,452	148,871	158,051	167,808	178,145	189,138	200,804
TOTAL NON–OPERATING INCOME	**128,747**	**15,638**	**66,085**	**103,725**	**133,452**	**148,871**	**158,051**	**167,808**	**178,145**	**189,138**	**200,804**
DEDUCTIONS											
Depreciation		612,911	3,137,392	6,796,216	11,705,565	14,938,153	15,912,317	16,894,734	17,935,403	19,042,196	20,216,688
Value Added Tax (on Sales)	771,303	803,320	2,505,594	9,333,002	19,540,942	21,062,662	22,310,170	23,549,597	24,355,000	25,451,355	26,535,701
Net Value Added Tax (on Projects)		0	3,144,821	9,232,741	10,209,972	(2,724,631)	(14,227,691)	(5,635,212)	0	0	0
Gas Rehabilitation Fund		481,992	1,503,356	5,599,801	11,724,565	12,637,597	13,386,102	14,129,758	14,613,000	15,270,813	15,921,420
TOTAL DEDUCTIONS	**771,303**	**1,898,223**	**10,291,164**	**30,961,761**	**53,181,043**	**45,963,781**	**37,380,899**	**48,938,878**	**56,903,404**	**59,764,365**	**62,673,810**
NET INCOME BEFORE INTEREST and TAXES	**129,056**	**(394,530)**	**(9,271,973)**	**3,039,722**	**35,763,927**	**48,841,714**	**62,963,020**	**56,772,277**	**51,448,143**	**52,834,005**	**53,956,727**
INTEREST and TAXES											
Interest Expenses		0	692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,303	12,771,016	11,554,729	10,338,442
Currency fluctuation loss on debt			0	23,941,469	26,537,982	7,479,968	4,190,802	3,707,478	3,255,790	3,041,297	2,792,439
Taxes:											
Corporate Income Tax	41,298	476,178	304,994	10,847,282	28,419,686	30,290,120	32,059,478	33,773,871	34,615,489	35,970,954	37,257,515
Excess Payroll Tax	33,267	363,006	1,534,064	2,407,820	3,097,894	3,455,818	3,668,903	3,895,419	4,135,366	4,390,559	4,661,362
Property Tax		225,807	1,604,599	2,181,546	4,412,916	6,704,639	7,315,786	7,861,057	8,139,571	8,333,912	8,586,508
Road Tax		19,280	60,134	223,992	468,983	505,504	535,444	565,190	584,520	610,833	636,857
TOTAL INTEREST and TAXES	**74,565**	**1,084,270**	**4,196,603**	**43,117,822**	**71,505,651**	**61,539,062**	**62,365,859**	**63,790,318**	**63,501,752**	**63,902,283**	**64,273,121**
NET INCOME	**54,491**	**(1,478,800)**	**(13,468,576)**	**(40,078,100)**	**(35,741,724)**	**(12,697,348)**	**597,160**	**(7,018,041)**	**(12,053,609)**	**(11,068,278)**	**(10,316,394)**
Memo: Weighted Ave Cost of Gas		8,839	25,851	83,593	153,434	158,560	163,640	169,042	175,113	181,182	187,426
Memo: Weighted Ave Sales Price of Gas		10,156	29,972	98,653	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Memo: Margin per unit sold		1,192	3,868	14,517	29,555	31,163	32,154	33,213	34,019	34,851	35,736
Memo: Cash Flow From Natural Gas		4,835,557	15,099,650	56,101,739	117,379,102	126,524,845	134,019,073	141,465,393	146,308,147	152,897,271	159,415,009
Memo: Cash Flows from LPG		(15,638)	(66,085)	(103,725)	(133,452)	(148,871)	(158,051)	(167,808)	(178,145)	(189,138)	(200,804)

Note A: Data for 1992 abstracted from 1992 Income Statement shown in separate schedule.

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BALANCE SHEET
(Rubles x 1000)

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
	(See Note B)										
ASSETS											
Current Assets											
Cash	95	877	4,583	6,694	8,361	9,226	9,741	10,288	10,868	11,484	12,139
Short–Term Investments	48,377	13,633,700	41,418,894	76,367,967	108,925,496	105,049,248	136,816,591	144,399,947	147,120,387	152,942,042	160,317,206
Cash & Short Term Investments	**48,472**	13,634,577	41,423,478	76,374,661	108,933,857	105,058,474	136,826,332	144,410,235	147,131,255	152,953,526	160,329,345
Accounts receivable – Gross *(See Note C.)*	**1,144,106**	13,376,875	37,977,539	123,727,797	236,485,781	249,979,419	264,831,037	279,562,950	291,887,629	307,575,592	323,066,368
Materials & equipment	**67,063**	619,105	2,616,336	4,106,521	5,283,439	5,893,877	6,257,291	6,643,612	7,052,841	7,488,071	7,949,923
Other assets	**40,905**	377,622	1,595,831	2,504,768	3,222,628	3,594,963	3,816,627	4,052,254	4,301,872	4,567,340	4,849,047
Total Current Assets	1,300,546	28,008,179	83,613,184	206,713,747	353,925,705	364,526,733	411,731,288	434,669,061	450,373,596	472,584,530	493,194,633
Fixed assets											
Adusted Cost of Fixed Assets	1,991,762	18,387,325	94,121,753	203,886,467	351,166,959	449,644,588	477,369,522	506,842,024	538,062,095	571,265,892	606,500,646
Less: Accumulated Depreciation	846,313	8,425,808	38,744,858	67,608,956	98,691,067	125,081,773	148,706,590	174,782,379	203,483,894	235,083,076	269,799,307
Net Revalued Assets	1,145,449	9,961,517	55,376,896	136,277,511	252,475,893	324,562,815	328,662,932	332,059,646	334,578,201	336,182,816	336,701,339
TOTAL ASSETS	**2,445,995**	**37,969,695**	**138,990,080**	**342,991,258**	**606,401,598**	**689,089,548**	**740,394,220**	**766,728,707**	**784,951,797**	**808,767,346**	**832,896,022**
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	**1,303,664**	19,812,410	55,513,837	177,039,349	332,823,381	350,485,840	371,321,264	391,982,308	410,023,190	432,754,877	455,195,059
Total Current Liabilities	1,303,664	19,812,410	55,513,837	177,039,349	332,823,381	350,485,840	371,321,264	391,982,308	410,023,190	432,754,877	455,195,059
Long Term Debt		0	13,856,227	56,458,025	114,905,777	145,954,469	145,954,469	133,791,597	121,628,724	109,465,852	97,302,980
Additional debt due to currency rate			0	23,941,469	50,479,452	57,959,420	62,150,222	60,369,558	57,594,575	54,116,090	49,964,817
Other Funds	**1,101,205**	10,165,981	42,961,435	67,430,951	86,756,481	96,780,138	102,747,568	100,091,140	115,810,854	122,957,538	130,541,360
Total Long Term Liabilities	1,101,205	10,165,981	56,817,662	147,830,446	252,141,709	300,694,027	310,852,260	303,252,295	295,034,153	286,539,480	277,809,157
Other Liabilities & Equity											
Net Revaluation Surplus		9,426,979	41,564,832	73,105,813	112,162,582	141,333,104	161,345,538	181,636,986	202,090,944	222,737,756	243,472,967
Reserve fund	0	0	0	0	0	0	0	0	0	0	0
Charter fund	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126
Retained Earnings	0	(1,478,800)	(14,947,376)	(55,025,476)	(90,767,200)	(103,464,549)	(103,165,968)	(110,184,010)	(122,237,618)	(133,305,896)	(143,622,290)
Net Equity	41,126	7,991,305	26,658,582	18,121,464	21,436,508	37,909,681	58,220,695	71,494,102	79,894,452	89,472,986	99,891,803
TOTAL LIABILITIES & EQUITY	**2,445,995**	**37,969,696**	**138,990,081**	**342,991,259**	**606,401,598**	**689,089,548**	**740,394,219**	**766,728,706**	**784,951,795**	**808,767,344**	**832,896,019**

Note B: Data for 1992 abstracted from 1992 Balance Sheet shown in separate schedule.
Note C: No allowance has been made for bad debts.

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Statement of Cash Flows

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Cash flows from operating activities:											
Net income		(1,478,800)	(13,468,576)	(40,078,100)	(35,741,724)	(12,697,348)	597,160	(7,018,041)	(12,053,609)	(11,068,278)	(10,316,394)
Adjustments to reconcile net income to cash provided by operating activities:											
Depreciation		612,911	3,137,392	6,796,216	11,705,565	14,988,153	15,912,317	16,894,734	17,935,403	19,042,196	20,216,688
Currency fluctuation loss on L/T debt			0	23,941,469	26,537,982	7,479,968	4,190,802	3,707,478	3,255,790	3,041,297	2,792,439
Changes in assets and liabilities:											
Accounts receivable		(12,232,769)	(24,600,664)	(85,750,258)	(112,757,983)	(13,493,639)	(14,851,618)	(14,731,913)	(12,324,678)	(15,687,964)	(15,490,776)
Materials and supplies		(552,042)	(1,997,232)	(1,490,185)	(1,176,918)	(610,437)	(363,414)	(386,321)	(409,228)	(435,231)	(461,852)
Other assets		(336,717)	(1,218,209)	(908,937)	(717,860)	(372,335)	(221,664)	(235,636)	(249,608)	(2[illegible]5,468)	(281,706)
Accounts payable		18,508,746	35,701,426	121,525,513	155,784,032	17,662,459	20,835,[illegible]24	20,661,044	18,040,882	22,731,688	22,440,182
Other funds		9,064,776	32,795,454	24,469,515	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,[illegible]46,685	7,583,822
Net cash provided by operations		**13,586,105**	**30,349,591**	**48,505,234**	**62,958,624**	**22,980,478**	**32,066,439**	**25,234,917**	**20,914,653**	**24,504,925**	**26,482,403**
Cash flows from investing activities:											
Note: Does not include internally–funded routine capital expenditures.											
Capital expenditures – Domestic		0	(2,560,690)	(13,554,051)	(30,399,427)	(26,855,861)	0	0	0	0	0
Capital expenditures – Foreign Source		0	(13,856,227)	(42,601,798)	(58,447,751)	(31,048,693)	0	0	0	0	0
Net cash used in investing activities		**0**	**(16,416,917)**	**(56,155,849)**	**(88,847,179)**	**(57,904,554)**	**0**	**0**	**0**	**0**	**0**
Cash flows from financing activities:											
Proceeds from issue of long term debt		0	13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Principal payments on long term debt		0	0	0	0	0	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
Loss on Currency Fluctuation		0	0	0	0	0	0	(5,488,142)	(6,030,773)	(6,519,782)	(6,943,712)
Principal payments on interim debt											
Dividends		0	0	0	0	0	(298,580)	0	0	0	0
Net cash provided (used in) financing activities		**0**	**13,856,227**	**42,601,798**	**58,447,751**	**31,048,693**	**(298,580)**	**(17,651,014)**	**(18,193,646)**	**(18,682,654)**	**(19,106,584)**
Net increase (decrease) in cash and cash equivalents		13,586,105	27,788,901	34,951,183	32,559,196	(3,875,383)	31,767,858	7,583,903	2,721,020	5,822,271	7,375,819
Cash and cash equivalents–beginning		48,472	13,634,577	41,423,478	76,374,661	108,933,857	105,058,474	136,826,332	144,410,235	147,131,255	152,953,526
Cash and cash equivalents–ending		13,634,577	41,423,478	76,374,661	108,933,857	105,058,474	136,826,332	144,410,235	147,131,255	152,953,526	160,329,345

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
REEVALUATION OF ASSETS											
Beginning Value of Assets (Gross)	**1,919,208**	1,991,762	18,387,325	94,121,753	203,886,467	351,166,959	449,644,588	477,369,522	506,842,024	538,062,095	571,265,892
Reevaluation Rate	0.000	8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluation	1,919,208	18,387,325	77,704,836	147,730,617	262,319,781	391,740,034	477,369,522	506,842,024	538,062,095	571,265,892	606,500,646
New Investments (Current Year)	**0**	0	16,416,917	56,155,849	88,847,179	57,904,554	0	0	0	0	0
Capitalized Costs	**72,537**										
Work in Progress	**17**										
Ending Value of Assets (Gross)	1,991,762	18,387,325	94,121,753	203,886,467	351,166,959	449,644,588	477,369,522	506,842,024	538,062,095	571,265,892	606,500,646
Accumulated Depreciation		846,313	8,425,808	38,744,858	67,608,956	98,691,067	125,081,773	148,706,590	174,782,379	203,483,894	235,083,076
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062
Reevaluated Accum. Depreciation	**846,313**	7,812,897	35,607,466	60,812,740	86,985,501	110,093,620	132,794,273	157,887,644	185,548,491	216,040,880	249,582,619
Current Depreciation		612,911	3,137,392	6,796,216	11,705,565	14,988,153	15,912,317	16,894,734	17,935,403	19,042,196	20,216,688
Net Value of Assets	1,145,449	9,961,517	55,376,896	136,277,511	252,475,893	324,562,815	328,662,932	332,059,646	334,578,201	336,182,816	336,701,339
Accum. Revaluation Surplus		16,395,563	75,713,074	129,321,938	187,755,252	228,328,327	256,053,261	285,525,764	316,745,834	349,949,631	385,184,386
Accum. Reevaluated Depreciation		6,966,584	34,148,242	56,216,125	75,592,670	86,995,224	94,707,724	103,888,778	114,654,890	127,211,875	141,711,419
Net Reevaluation Surplus		9,428,979	41,564,832	73,105,813	112,162,582	141,333,104	161,345,538	181,636,986	202,090,944	222,737,756	243,472,967

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Sales Forecast

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
(Cubic Meters x 1000)											
Natural Gas – Purchases											
Residential	305,375	301,081	295,902	308,550	319,757	329,586	338,116	345,439	335,938	331,293	326,627
Other	3,986,282	3,814,685	3,645,949	3,581,028	3,664,684	3,730,561	3,829,876	3,913,853	3,964,883	4,055,908	4,13[illegible],316
Total	4,291,657	4,115,766	3,941,851	3,889,578	3,984,441	4,060,147	4,167,992	4,259,292	4,300,821	4,387,201	4,460,943
Losses (%)											
Residential	1.4%	1.4%									
Other	1.4%	1.4%	1.1%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas – Sales											
Residential	301,100	296,866	295,902	308,550	319,757	329,586	338,116	345,439	335,938	331,293	326,627
Other	3,930,474	3,761,279	3,607,667	3,555,961	3,651,858	3,730,561	3,829,876	3,913,853	3,964,883	4,055,908	4,134,316
Total	4,231,574	4,058,145	3,903,569	3,864,511	3,971,615	4,060,147	4,167,992	4,259,292	4,300,821	4,387,201	4,460,943
(Tons)											
LPG – Purchases	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Losses (%)	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%	–1.4%
LPG – Sales	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
(Rubles per 1000 Cubic Meters)											
Natural Gas – Cost of Purchases (Includes V.A.T.)											
Residential (1993 Basis = 600 + V.A.T.)		720	4,361	26,419	66,054	68,300	70,486	72,812	75,288	77,772	80,338
Other (1993 Basis = 7900 + V.A.T.)		9,480	27,595	88,520	161,058	166,535	171,864	177,535	183,571	189,629	195,887
Percentage Increase in Unit Cost											
Residential			506%	506%	150%	3%	3%	3%	3%	3%	3%
Other			191%	221%	82%	3%	3%	3%	3%	3%	3%
General Price Level			323%	57%	29%	12%	6%	6%	6%	6%	6%
Natural Gas Sales Margins											
Residential		2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778	2.778
Other		1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139	1.139
Natural Gas – Sales Prices											
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
LPG – Purchases (Rubles per Ton)		20,966	88,603	139,068	178,925	199,597	211,904	224,987	238,846	253,585	269,226
LPG – Sales Margin		0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
LPG – Sales (Rubles per Ton)		8,232	34,787	54,601	70,249	78,366	83,198	88,334	93,775	99,562	105,703

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Assumptions

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Excess Payroll Tax (of Payroll)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Applicable to x% of Payroll	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Corporate Income Tax (of Profits)	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Property Tax (of Assets)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
VAT (See: VAT Schedule)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Gas Rehab Fund (% of Sales Margin)		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Road Tax (of Sales Margin)	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Duties (Foreign Suppliers)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
LPG Subsidy (of LPG Losses)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Depreciation (Years – Straight Line)	30	30	30	30	30	30	30	30	30	30	30
Interest		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Dividend Pay Out		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Escalation Rates											
(World Bank Assumptions)											
Int'l in US$			1.2%	2.4%	3.2%	3.5%	3.2%	3.3%	3.4%	3.3%	3.3%
Adjust to 1993; Thereafter 1993 = 100		1.30%	101.20%	103.60%	106.90%	110.60%	114.10%	117.90%	121.90%	125.90%	130.10%
Russian		823.2%	322.6%	57.0%	28.7%	11.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Adjust to 1993; Thereafter 1993 = 100		823.17%	422.60%	663.30%	853.40%	952.00%	1010.70%	1073.10%	1139.20%	1209.50%	1284.10%
US$/Ruble Exchange		1,025	2,627	3,741	4,605	4,841	4,980	5,118	5,255	5,401	5,556
Depreciation Rate		0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Reevaluation Rate		8.232	3.226	0.570	0.287	0.116	0.062	0.062	0.062	0.062	0.062

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Gas Cost Calculation											
Price in Rubles/1000 Cubic Meters											
Initial Forecast (World Bank Assumptions)											
Residential (Incl. V.A.T.)		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other (Purchase + Surcharge + V.A.T.)		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Adjustment		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Residential		2,000	12,115	73,386	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Other		10,800	31,437	100,845	183,484	189,723	195,794	202,255	209,132	216,033	223,162
Net Income / Net Revalued Assets		−14.8%	−24.3%	−29.4%	−14.2%	−3.9%	0.2%	−2.1%	−3.6%	−3.3%	−3.1%
Average over Period 1998–2002							−2.4%				
External Financing		0.0%	88.1%	80.9%	73.8%	68.8%	68.8%				

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	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
FUNDING OF PROJECTS											
Proposed Project											
Domestic Supplier (1993 – US$ x 000)			442.00	2398.00	4988.00	4436.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			447	2,484	5,332	4,906	0	0	0	0	0
Duties on Foreign Suppliers			692,811	2,130,090	2,922,388	1,552,435	0	0	0	0	0
Domestic Supplier (Current – Rubles x 000)			1,867,879	11,423,961	27,477,040	25,303,426	0	0	0	0	0
Foreign Supplier (1993 – US$ x 000)			5212.00	11124.00	11873.00	5799.00	0.00	0.00	0.00	0.00	0.00
Escalated to Current – Int'l Inflation			5,275	11,524	12,692	6,414	0	0	0	0	0
Foreign Supplier (Current – Rubles x 000)			13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Interim Calculations											
Net Profit after Tax + Deprec. + Int.		(865,889)	(10,331,184)	(33,281,885)	(24,036,159)	2,290,805	16,509,478	9,876,693	5,881,795	7,973,919	9,900,294
Less Retirements			0	0	0	0	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
Less Domestic Suppliers		0	(2,560,690)	(13,554,051)	(30,399,427)	(26,855,861)	0	0	0	0	0
Less Dividends		0	0	0	0	0	(298,580)	0	0	0	0
Funds Available/(Required)		(865,889)	(12,891,874)	(46,835,935)	(54,435,586)	(24,565,056)	16,210,898	(2,286,180)	(6,281,078)	(4,188,954)	(2,262,578)
External Sources (Foreign Projects)		0	13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Accumulative Long – Term Debt			13,856,227	56,458,025	114,905,777	145,954,469	145,954,469	133,791,597	121,628,724	109,465,852	97,302,980
Retirements								12,162,872	12,162,872	12,162,872	12,162,872
Interest			692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,303	12,771,016	11,554,729	10,338,442
Memo: Total Project		0	15,724,106	69,749,865	155,674,656	212,026,775	212,026,775	212,026,775	212,026,775	212,026,775	212,026,775
Memo: % Externally Financed		0.0%	88.1%	80.9%	73.8%	68.8%	68.8%				
Computation of ending retained earnings:											
Beginning retained earnings		0	(1,478,800)	(14,947,376)	(55,025,476)	(90,767,200)	(103,464,549)	(103,165,968)	(110,184,010)	(122,237,618)	(133,305,896)
adjusted net income		(1,478,800)	(13,468,576)	(40,078,100)	(35,741,724)	(12,697,348)	597,160	(7,018,041)	(12,053,609)	(11,068,278)	(10,316,394)
less: dividends		0	0	0	0	0	(298,580)	0	0	0	0
Ending retained earnings – to B/S		(1,478,800)	(14,947,376)	(55,025,476)	(90,767,200)	(103,464,549)	(103,165,968)	(110,184,010)	(122,237,618)	(133,305,896)	(143,622,290)

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VORONEZH
Case–VZ–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
V.A.T. CALCULATIONS											
On Project Investments											
1994 Investment			15,724,106								
VAT Payment			3,144,821								
VAT Recapture				(1,572,411)	(1,572,411)						
1995 Investment				54,025,759							
VAT Payment				10,805,152							
VAT Recapture					(5,402,576)	(5,402,576)					
1995 Investment					85,924,791						
VAT Payment					17,184,958						
VAT Recapture						(8,592,479)	(8,592,479)				
1996 Investment						56,352,119					
VAT Payment						11,270,424					
VAT Recapture							(5,635,212)	(5,635,212)			
Value Added Tax on Projects		0	3,144,821	10,805,152	17,184,958	11,270,424	0	0	0	0	0
Total Recapture of Value Added Tax		0	0	(1,572,411)	(6,974,987)	(13,995,055)	(14,227,691)	(5,635,212)	0	0	0
Net V.A.T. on Projects		0	3,144,821	9,232,741	10,209,972	(2,724,631)	(14,227,691)	(5,635,212)	0	0	0
On Sales											
(a) GAS & LPG Purchases		36,405,508	102,007,245	325,311,624	611,566,384	644,021,334	682,306,640	720,271,520	753,421,826	795,191,535	836,425,601
(b) Commodity = = Purchases / (1 + VAT Rate)		30,337,923	85,006,038	271,093,020	509,638,654	536,684,445	568,588,867	600,226,267	627,851,521	662,659,613	697,021,334
(c) VAT Included = Line (b) – Line (b)		6,067,585	17,001,208	54,218,604	101,927,731	107,336,889	113,717,773	120,045,253	125,570,304	132,531,923	139,404,267
(d) GAS & LPG Sales		41,225,427	117,040,810	381,309,639	728,812,033	770,397,308	816,167,663	861,569,105	899,551,828	947,899,668	995,639,805
(e) Commodity = = Purchases / (1 + VAT Rate)		34,354,523	97,534,008	317,758,032	607,343,361	641,997,757	680,139,719	717,974,254	749,626,523	789,916,390	829,699,838
(f) VAT Included = Line (d) – Line (e)		6,870,905	19,506,802	63,551,606	121,468,672	128,399,551	136,027,944	143,594,851	149,925,305	157,983,278	165,939,968
(g) Utility's VAT Liability = Line (f) – Line (c)		803,320	2,505,594	9,333,002	19,540,942	21,062,662	22,310,170	23,549,597	24,355,000	25,451,355	26,535,701
Test											
Margin on GAS & LPG Sales		4,819,920	15,033,565	55,998,014	117,245,649	126,375,974	133,861,023	141,297,585	146,130,002	152,708,133	159,214,205
VAT as a % of Margin		16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%

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Case–VZ–4

	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Computation of Currency Revaluation on Long Term Debt										
Debt in rubles			56,458,025	114,905,777	145,954,469	145,954,469	133,791,597	121,628,724	109,465,852	97,302,980
Beginning ruble/US$ exchange rate			$0.000380662	$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151
Ending ruble/US$ exchange rate			$0.000267308	$0.000217155	$0.000206569	$0.000200803	$0.000195389	$0.000190295	$0.000185151	$0.000179986
Decline in value			$0.000113354	$0.000050153	$0.000010586	$0.000005766	$0.000005414	$0.000005094	$0.000005144	$0.000005165
Additional ruble debt/expense to record – in US$			6,400	5,763	1,545	842	724	620	563	503
Additional ruble debt/expense to record – in rubles			23,941,469	26,537,982	7,479,968	4,190,802	3,707,478	3,255,790	3,041,297	2,792,439
cumulative			23,941,469	50,479,452	57,959,420	62,150,222	65,857,700	69,113,490	72,154,787	74,947,226
Computation of payment on additional L/T debt – 1/12th							5,488,142	6,030,773	6,519,782	6,943,712
cumulative							5,488,142	11,518,915	18,038,697	24,982,409

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Case – VZ – 4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Balance Sheet Analysis (Percentages)											
ASSETS											
Current Assets											
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short – Term Investments	2.0%	35.9%	29.8%	22.3%	18.0%	15.2%	18.5%	18.8%	18.7%	18.9%	19.2%
Cash & Investments	2.0%	35.9%	29.8%	22.3%	18.0%	15.2%	18.5%	18.8%	18.7%	18.9%	19.2%
Accounts receivable	46.8%	35.2%	27.3%	36.1%	39.0%	36.3%	35.8%	36.5%	37.2%	38.0%	38.8%
Materials & equipment	2.7%	1.6%	1.9%	1.2%	0.9%	0.9%	0.8%	0.9%	0.9%	0.9%	1.0%
Other assets	1.7%	1.0%	1.1%	0.7%	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%	0.6%
Total Current Assets	53.2%	73.8%	60.2%	60.3%	58.4%	52.9%	55.6%	56.7%	57.4%	58.4%	59.6%
Fixed assets											
Adusted Cost of Fixed Assets	81.4%	48.4%	67.7%	59.4%	57.9%	65.3%	64.5%	66.1%	68.5%	70.6%	72.8%
Less: Accumulated Depreciation	34.6%	22.2%	27.9%	19.7%	16.3%	18.2%	20.1%	22.8%	25.9%	29.1%	32.4%
Net Revalued Assets	46.8%	26.2%	39.8%	39.7%	41.6%	47.1%	44.4%	43.3%	42.6%	41.6%	40.4%
TOTAL ASSETS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
LIABILITIES & EQUITY											
Current Liabilities											
Accounts payable	53.3%	52.2%	39.9%	51.6%	54.9%	50.9%	50.2%	51.1%	52.2%	53.5%	54.7%
Total Current Liabilities	53.3%	52.2%	39.9%	51.6%	54.9%	50.9%	50.2%	51.1%	52.2%	53.5%	54.7%
Long Term Debt	0.0%	0.0%	10.0%	16.5%	18.9%	21.2%	19.7%	17.4%	15.5%	13.5%	11.7%
Additional debt due to currency rate	0.0%	0.0%	0.0%	7.0%	8.3%	8.4%	8.4%	7.9%	7.3%	6.7%	6.0%
Other Funds	45.0%	26.8%	30.9%	19.7%	14.3%	14.0%	13.9%	14.2%	14.8%	15.2%	15.7%
Total Long Term Liabilities	45.0%	26.8%	40.9%	43.1%	41.6%	43.6%	42.0%	39.6%	37.6%	35.4%	33.4%
Other Liabilities & Equity											
Net Revaluation Surplus	0.0%	24.8%	29.9%	21.3%	18.5%	20.5%	21.8%	23.7%	25.7%	27.5%	29.2%
Reserve fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Charter fund	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retained Earnings	0.0%	−3.9%	−10.8%	−16.0%	−15.0%	−15.0%	−13.9%	−14.4%	−15.6%	−16.5%	−17.2%
Net Equity	1.7%	21.0%	19.2%	5.3%	3.5%	5.5%	7.9%	9.3%	10.2%	11.1%	12.0%
TOTAL LIABILITIES & EQUITY	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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Case – VZ – 4

RATIOS	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Current assets	1,300,546	28,008,179	83,613,184	206,713,747	353,925,705	364,526,733	411,731,288	434,669,061	450,373,596	472,584,530	496,194,683
Current liabilities	1,303,664	19,812,410	55,513,837	177,039,349	332,823,381	350,485,840	371,321,264	391,982,308	410,023,190	432,754,877	455,195,059
Working capital	(3,118)	8,195,768	28,099,348	29,674,398	21,102,324	14,040,893	40,410,024	42,686,753	40,350,407	39,829,653	40,999,623
Change in working capital		8,198,886	19,903,580	1,575,050	(8,572,074)	(7,061,431)	26,369,131	2,276,729	(2,336,346)	(520,754)	1,169,970
Current ratio	1.00	1.41	1.51	1.17	1.06	1.04	1.11	1.11	1.10	1.09	1.09
Capitalization Table:											
Debt	1,101,205	10,165,981	56,817,662	147,830,446	252,141,709	300,694,027	310,852,260	303,252,295	295,034,153	286,539,480	277,809,157
Equity	41,126	7,991,305	26,658,582	18,121,464	21,436,508	37,909,681	58,220,695	71,494,102	79,894,452	89,472,986	99,891,803
Percent debt	96.4%	56.0%	68.1%	89.1%	92.2%	88.8%	84.2%	80.9%	78.7%	76.2%	73.6%
Percent equity	3.6%	44.0%	31.9%	10.9%	7.8%	11.2%	15.8%	19.1%	21.3%	23.8%	26.4%
Times Interest Earned:											
Net income	54,491	(1,478,800)	(13,468,576)	(40,078,100)	(35,741,724)	(12,697,348)	597,160	(7,018,041)	(12,053,609)	(11,068,278)	(10,316,394)
Add back: interest expense	0	0	692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,303	12,771,016	11,554,729	10,338,442
depreciation	0	612,911	3,137,392	6,796,216	11,705,565	14,988,153	15,912,317	16,894,734	17,935,403	19,042,195	20,216,688
taxes	74,565	1,084,270	4,196,603	43,117,822	71,505,651	61,539,062	62,365,859	63,790,318	63,501,752	63,902,283	64,273,121
total	129,056	218,381	(5,441,770)	13,351,650	56,037,682	76,872,879	93,470,784	87,654,315	82,154,562	83,430,930	84,511,857
Interest	0	0	692,811	3,515,713	8,568,190	13,043,012	14,595,447	13,987,303	12,771,016	11,554,729	10,338,442
Time interest earned			−7.9	3.8	6.5	5.9	6.4	6.3	6.4	7.2	8.2
Operating revenue	3,525,955	41,225,427	117,040,810	381,309,639	728,812,033	770,397,308	816,167,663	861,569,105	899,551,828	947,899,668	995,639,805
Operating expenses (B4 depr, tax)	2,773,444	39,894,606	116,752,173	348,454,811	641,342,346	677,237,547	717,570,953	757,713,030	793,169,630	837,392,175	881,229,108
Operating margin	752,511	1,330,822	288,637	32,854,828	87,469,687	93,159,761	98,596,710	103,856,074	106,382,198	110,507,493	114,410,698
Percent	21.3%	3.2%	0.2%	8.6%	12.0%	12.1%	12.1%	12.1%	11.8%	11.7%	11.5%
Net income to total revenue	1.5%	−3.6%	−11.4%	−10.5%	−4.9%	−1.6%	0.1%	−0.8%	−1.3%	−1.2%	−1.0%
Return on total assets	2.2%	−3.9%	−9.7%	−11.7%	−5.9%	−1.8%	0.1%	−0.9%	−1.5%	−1.4%	−1.2%
Return on beginning equity		−3595.8%	−168.5%	−150.3%	−197.2%	−59.2%	1.6%	−12.1%	−16.9%	−13.9%	−11.5%
Dividend payout ratio		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
Accum. Deprec. / Assets	42.5%	45.8%	41.2%	33.2%	28.1%	27.8%	31.2%	34.5%	37.8%	41.2%	44.5%
Receivables / Sales	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%	32.4%
Increase in gas rates:											
Residential			605.8%	605.7%	250.0%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%
Commercial/other			291.1%	320.8%	181.9%	103.4%	103.2%	103.3%	103.4%	103.3%	103.3%

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Case–VZ–4

	Basis for Forecast 1992	Estimated 1993	Estimated 1994	Estimated 1995	Estimated 1996	Estimated 1997	Estimated 1998	Estimated 1999	Estimated 2000	Estimated 2001	Estimated 2002
Worksheet for Cash Flow Statement:											
Debits:											
Cash and investments		13,586,105	27,788,901	34,951,183	32,559,197	(3,875,383)	31,767,858	7,583,902	2,721,020	5,622,271	7,375,819
Accounts receivable		12,232,769	24,600,664	85,750,258	112,757,993	13,493,639	14,851,618	14,731,913	12,324,678	15,687,964	15,490,776
Materials & equipment		552,042	1,997,232	1,490,185	1,176,918	610,437	363,414	386,321	409,228	435,231	461,852
Other assets		336,717	1,218,209	908,937	717,060	372,335	221,664	235,636	249,608	265,468	281,706
Net fixed assets		8,816,068	45,415,379	80,900,615	116,198,382	72,086,922	4,100,117	3,396,714	2,518,555	1,604,615	518,523
		35,523,701	101,020,385	204,001,178	263,410,340	82,687,950	51,304,671	26,334,486	18,223,089	23,815,549	24,128,676
Credits:											
Accounts payable		18,508,746	35,701,426	121,525,513	155,784,032	17,662,459	20,835,424	20,661,044	18,040,882	22,731,688	22,440,182
Long term debt		0	13,856,227	42,601,798	58,447,751	31,043,693	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
Currency fluctuation on L/T debt			0	23,941,469	26,537,982	7,479,968	4,190,802	(1,780,604)	(2,774,983)	(3,478,485)	(4,151,273)
Other funds		9,064,776	32,795,454	24,469,516	19,325,530	10,023,657	5,967,431	6,343,572	6,719,713	7,146,685	7,583,822
Equity/retained earnings		7,950,179	18,667,277	(8,537,119)	3,315,044	16,473,173	20,311,014	13,273,407	8,400,350	9,578,534	10,418,817
		35,523,701	101,020,384	204,001,177	263,410,339	82,687,950	51,304,671	26,334,487	18,223,090	23,815,550	24,128,676
check. net change debits and credits		0	(1)	(1)	(1)	0	0	1	1	1	0
Does balance sheet balance?		1	1	1	0	0	(1)	(1)	(2)	(2)	(2)
check: analysis of change in fixed assets		0	0	(0)	(0)	(0)	0	(0)	(0)	0	(0)
check: analysis of change in equity/RE		0	(0)	(0)	(0)	(0)	(0)	(0)	0	0	(0)
check: analysis of long term debt		0	0	0	0	0	0	0	0	0	0
check: net change in cash to statement		0	0	0	0	(0)	(0)	0	(0)	(0)	(0)
Analysis of change in net fixed assets:											
Revaluation write up of assets		16,395,563	59,317,511	53,608,864	58,433,314	40,573,075	27,724,934	29,472,502	31,220,071	33,203,797	35,234,754
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(22,067,883)	(19,376,545)	(11,402,554)	(7,712,500)	(9,181,054)	(10,766,112)	(12,556,985)	(14,499,543)
Current depreciation		(612,911)	(3,137,392)	(6,796,216)	(11,705,565)	(14,988,153)	(15,912,317)	(16,894,734)	(17,935,403)	(19,042,196)	(20,216,688)
New capital expenditures, net		0	16,416,917	56,155,849	88,847,179	57,904,554	0	0	0	0	0
		8,816,068	45,415,379	80,900,615	116,198,382	72,086,922	4,100,117	3,396,714	2,518,555	1,604,615	518,523
Analysis of change in net equity/RE											
Net income		(1,478,800)	(13,468,576)	(40,078,100)	(35,741,724)	(12,697,348)	597,160	(7,018,041)	(12,053,609)	(11,068,278)	(10,316,394)
Revaluation surplus (direct cr. to equity)		16,395,563	59,317,511	53,608,864	58,433,314	40,573,075	27,724,934	29,472,502	31,220,071	33,203,797	35,234,754
Revaluation of accum depreciation		(6,966,584)	(27,181,658)	(22,067,883)	(19,376,545)	(11,402,554)	(7,712,500)	(9,181,054)	(10,766,112)	(12,556,985)	(14,499,543)
Dividends declared		0	0	0	0	0	(298,580)	0	0	0	0
		7,950,179	18,667,277	(8,537,119)	3,315,044	16,473,173	20,311,014	13,273,407	8,400,350	9,578,534	10,418,817
Analysis of change in long term debt:											
New debt issued		0	13,856,227	42,601,798	58,447,751	31,048,693	0	0	0	0	0
Retirement of long term debt		0	0	0	0	0	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)
		0	13,856,227	42,601,798	58,447,751	31,048,693	0	(12,162,872)	(12,162,872)	(12,162,872)	(12,162,872)

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GAS COST CALCULATIONS AND INFLATION ASSUMPTIONS

Per Assumptions provided by The World Bank
(See Note A.)

	Russian Industrial Price (Rubles)	Russian Residential Price (Rubles)	Int'l Inflation Rate	Int'l Inflation Index	Russian Inflation Rate	Russian Inflation Index	Ruble/ U.S. Exchange	Target Gas Price (U.S.$)	Target Gas Price (Rubles)
				998		681	928	$40.00	37,120
06/01/93			0.108%	999	19.900%	817	1,080	$40.04	43,247
07/01/93			0.108%	1000	22.400%	1000	1,025	$40.09	41,088
08/01/93	10,800	2,000	0.099%	1001	26.000%	1260	986	$40.13	39,564
09/01/93	11,902	2,000	0.099%	1002	20.000%	1512	1,073	$40.17	43,098
10/01/93	13,116	2,000	0.099%	1003	20.000%	1814	1,178	$40.21	47,363
11/01/93	14,454	2,000	0.099%	1004	20.000%	2177	1,693	$40.25	68,136
12/01/93	15,928	2,000	0.099%	1005	20.000%	2613	1,936	$40.29	77,994
01/01/94	17,553	4,922	0.099%	1006	12.000%	2926	2,112	$40.33	85,169
02/01/94	19,343	4,922	0.099%	1007	10.000%	3219	2,254	$40.37	90,985
03/01/94	21,316	4,922	0.099%	1008	8.000%	3476	2,363	$40.41	95,480
04/01/94	23,491	4,922	0.099%	1009	5.000%	3650	2,422	$40.45	97,961
05/01/94	25,887	4,922	0.099%	1010	5.000%	3833	2,484	$40.49	100,569
06/01/94	28,527	4,922	0.099%	1011	5.000%	4024	2,548	$40.53	103,263
07/01/94	31,437	12,115	0.099%	1012	5.000%	4226	2,627	$40.57	106,570
08/01/94	34,644	12,115	0.198%	1014	5.000%	4437	2,720	$40.65	110,561
09/01/94	38,178	12,115	0.198%	1016	5.000%	4659	2,818	$40.73	114,771
10/01/94	42,073	12,115	0.198%	1018	5.000%	4892	2,919	$40.81	119,120
11/01/94	46,364	12,115	0.198%	1020	5.000%	5136	3,036	$40.89	124,140
12/01/94	51,094	12,115	0.198%	1022	5.000%	5393	3,159	$40.97	129,425
01/01/95	56,306	29,817	0.198%	1024	3.000%	5555	3,171	$41.05	130,173
02/01/95	62,049	29,817	0.198%	1026	3.000%	5721	3,171	$41.13	130,431
03/01/95	68,378	29,817	0.198%	1028	3.000%	5893	3,171	$41.21	130,689
04/01/95	75,353	29,817	0.198%	1030	3.000%	6070	3,444	$41.30	142,221
05/01/95	83,040	29,817	0.198%	1032	3.000%	6252	3,444	$41.38	142,502
06/01/95	91,511	29,817	0.198%	1034	3.000%	6440	3,444	$41.46	142,784
07/01/95	100,845	73,386	0.198%	1036	3.000%	6633	3,741	$41.54	155,404
08/01/95	111,132	73,386	0.263%	1039	3.000%	6832	3,741	$41.65	155,813
09/01/95	122,468	73,386	0.263%	1042	3.000%	7037	3,741	$41.76	156,222
10/01/95	134,961	73,386	0.263%	1044	3.000%	7248	4,063	$41.87	170,115

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GAS COST CALCULATIONS AND INFLATION ASSUMPTIONS

Per Assumptions provided by The World Bank
(See Note A.)

	Russian Industrial Price (Rubles)	Russian Residential Price (Rubles)	Int'l Inflation Rate	Int'l Inflation Index	Russian Inflation Rate	Russian Inflation Index	Ruble/ U.S. Exchange	Target Gas Price (U.S.$)	Target Gas Price (Rubles)
11/01/95	**148,727**	73,386	0.263%	1047	**3.000%**	7465	4,063	$41.98	170,562
12/01/95	**163,899**	73,386	0.263%	1050	**3.000%**	7689	4,063	$42.09	171,010
01/01/96	**180,617**	**180,617**	0.263%	1053	**1.500%**	7805	**4,280**	$42.20	180,617
02/01/96	**181,092**	180,617	0.263%	1056	**1.500%**	7922	4,280		
03/01/96	**181,568**	180,617	0.263%	1058	**1.500%**	8040	4,280		
04/01/96	**182,045**	180,617	0.263%	1061	**1.500%**	8161	**4,439**		
05/01/96	**182,524**	180,617	0.263%	1064	**1.500%**	8283	4,439		
06/01/96	**133,003**	180,617	0.263%	1067	**1.500%**	8408	4,439		
07/01/96	**183,484**	**183,484**	0.263%	1069	**1.500%**	8534	**4,605**		
08/01/96	**183,996**	183,484	**0.279%**	1072	**1.500%**	8662	4,605		
09/01/96	**184,510**	183,484	0.279%	1075	**1.500%**	8792	4,605		
10/01/96	**185,024**	183,484	0.279%	1078	**1.500%**	8924	**4,777**		
11/01/96	**185,541**	183,484	0.279%	1081	**1.500%**	9057	4,777		
12/01/96	**186,058**	183,484	0.279%	1084	**1.500%**	9193	4,777		
01/01/97	**186,577**	**186,577**	0.279%	1087	**0.500%**	9239	4,786		
02/01/97	**187,098**	186,577	0.279%	1091	**0.500%**	9285	4,795		
03/01/97	**187,620**	186,577	0.279%	1094	**0.500%**	9332	4,804		
04/01/97	**188,144**	186,577	0.279%	1097	**0.500%**	9379	4,813		
05/01/97	**188,668**	186,577	0.279%	1100	**0.500%**	9425	4,823		
06/01/97	**189,195**	186,577	0.279%	1103	**0.500%**	9473	4,832		
07/01/97	**189,723**	**189,723**	0.279%	1106	**0.500%**	9520	**4,841**		
08/01/97	**190,221**	189,723	**0.263%**	1109	**0.500%**	9568	4,852		
09/01/97	**190,721**	189,723	0.263%	1112	**0.500%**	9615	4,864		
10/01/97	**191,223**	189,723	0.263%	1115	**0.500%**	9663	4,875		
11/01/97	**191,725**	189,723	0.263%	1117	**0.500%**	9712	4,887		
12/01/97	**192,229**	189,723	0.263%	1120	**0.500%**	9760	4,898		
01/01/98	**192,734**	**192,734**	0.263%	1123	**0.500%**	9809	4,910		
02/01/98	**193,241**	192,734	0.263%	1126	**0.500%**	9858	4,922		
03/01/98	**193,749**	192,734	0.263%	1129	**0.500%**	9907	4,933		
04/01/98	**194,258**	192,734	0.263%	1132	**0.500%**	9957	4,945		

GAS COST CALCULATIONS AND INFLATION ASSUMPTIONS

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	Russian Industrial Price (Rubles)	Russian Residential Price (Rubles)	Int'l Inflation Rate	Int'l Inflation Index	Russian Inflation Rate	Russian Inflation Index	Ruble/ U.S. Exchange	Target Gas Price (U.S.$)	Target Gas Price (Rubles)
05/01/98	**194,769**	192,734	0.263%	1135	**0.500%**	10007	4,957		
06/01/98	**195,281**	192,734	0.263%	1138	**0.500%**	10057	4,968		
07/01/98	**195,794**	**195,794**	0.263%	1141	**0.500%**	10107	**4,980**		
08/01/98	**196,324**	195,794	**0.271%**	1144	**0.500%**	10158	4,991		
09/01/98	**196,856**	195,794	0.271%	1147	**0.500%**	10208	5,003		
10/01/98	**197,390**	195,794	0.271%	1150	**0.500%**	10260	5,014		
11/01/98	**197,924**	195,794	0.271%	1154	**0.500%**	10311	5,026		
12/01/98	**198,461**	195,794	0.271%	1157	**0.500%**	10362	5,037		
01/01/99	**198,998**	**198,998**	0.271%	1160	**0.500%**	10414	5,049		
02/01/99	**199,537**	198,998	0.271%	1163	**0.500%**	10466	5,060		
03/01/99	**200,078**	198,998	0.271%	1166	**0.500%**	10519	5,072		
04/01/99	**200,620**	198,998	0.271%	1169	**0.500%**	10571	5,083		
05/01/99	**201,164**	198,998	0.271%	1172	**0.500%**	10624	5,095		
06/01/99	**201,709**	198,998	0.271%	1176	**0.500%**	10677	5,106		
07/01/99	**202,255**	**202,255**	0.271%	1179	**0.500%**	10731	**5,118**		
08/01/99	**202,819**	202,255	**0.279%**	1182	**0.500%**	10784	5,129		
09/01/99	**203,385**	202,255	0.279%	1185	**0.500%**	10838	5,141		
10/01/99	**203,953**	202,255	0.279%	1189	**0.500%**	10892	5,152		
11/01/99	**204,522**	202,255	0.279%	1192	**0.500%**	10947	5,163		
12/01/99	**205,092**	202,255	0.279%	1195	**0.500%**	11001	5,175		
01/01/00	**205,665**	**205,665**	0.279%	1199	**0.500%**	11056	5,186		
02/01/00	**206,238**	205,665	0.279%	1202	**0.500%**	11112	5,197		
03/01/00	**206,814**	205,665	0.279%	1205	**0.500%**	11167	5,209		
04/01/00	**207,391**	205,665	0.279%	1209	**0.500%**	11223	5,220		
05/01/00	**207,970**	205,665	0.279%	1212	**0.500%**	11279	5,232		
06/01/00	**208,550**	205,665	0.279%	1216	**0.500%**	11336	5,243		
07/01/00	**209,132**	**209,132**	0.279%	1219	**0.500%**	11392	**5,255**		
08/01/00	**209,698**	209,132	**0.271%**	1222	**0.500%**	11449	5,267		
09/01/00	**210,266**	209,132	0.271%	1226	**0.500%**	11507	5,279		
10/01/00	**210,836**	209,132	0.271%	1229	**0.500%**	11564	5,291		

GAS COST CALCULATIONS AND INFLATION ASSUMPTIONS

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	Russian Industrial Price (Rubles)	Russian Residential Price (Rubles)	Int'l Inflation Rate	Int'l Inflation Index	Russian Inflation Rate	Russian Inflation Index	Ruble/ U.S. Exchange	Target Gas Price (U.S.$)	Target Gas Price (Rubles)
11/01/00	**211,407**	209,132	0.271%	1232	**0.500%**	11622	5,303		
12/01/00	**211,980**	209,132	0.271%	1236	**0.500%**	11680	5,315		
01/01/01	**212,554**	**212,554**	0.271%	1239	**0.500%**	11738	5,327		
02/01/01	**213,130**	212,554	0.271%	1242	**0.500%**	11797	5,340		
03/01/01	**213,708**	212,554	0.271%	1246	**0.500%**	11856	5,352		
04/01/01	**214,287**	212,554	0.271%	1249	**0.500%**	11915	5,364		
05/01/01	**214,867**	212,554	0.271%	1252	**0.500%**	11975	5,376		
06/01/01	**215,449**	212,554	0.271%	1256	**0.500%**	12035	5,389		
07/01/01	**216,033**	**216,033**	0.271%	1259	**0.500%**	12095	**5,401**		
08/01/01	**216,618**	216,033	**0.271%**	1263	**0.500%**	12155	5,414		
09/01/01	**217,205**	216,033	0.271%	1266	**0.500%**	12216	5,427		
10/01/01	**217,794**	216,033	0.271%	1269	**0.500%**	12277	5,439		
11/01/01	**218,384**	216,033	0.271%	1273	**0.500%**	12339	5,452		
12/01/01	**218,975**	216,033	0.271%	1276	**0.500%**	12400	5,465		
01/01/02	**219,569**	**219,569**	0.271%	1280	**0.500%**	12462	5,478		
02/01/02	**220,164**	219,569	0.271%	1283	**0.500%**	12525	5,491		
03/01/02	**220,760**	219,569	0.271%	1287	**0.500%**	12587	5,504		
04/01/02	**221,358**	219,569	0.271%	1290	**0.500%**	12650	5,517		
05/01/02	**221,958**	219,569	0.271%	1294	**0.500%**	12714	5,530		
06/01/02	**222,559**	219,569	0.271%	1297	**0.500%**	12777	5,543		
07/01/02	**223,162**	**223,162**	0.271%	1301	**0.500%**	12841	**5,556**		
08/01/02	**223,749**	223,162	**0.263%**	1304	**0.500%**	12905	5,569		
09/01/02	**224,337**	223,162	0.263%	1308	**0.500%**	12970	5,582		
10/01/02	**224,926**	223,162	0.263%	1311	**0.500%**	13035	5,595		
11/01/02	**225,518**	223,162	0.263%	1314	**0.500%**	13100	5,609		
12/01/02	**226,110**	223,162	0.263%	1318	**0.500%**	13165	5,622		

Note A: Residential and industrial gas prices are set to increase to US$40 ($-1993). by January 1, 1996. Thereafter both prices rise at the rate of inflation.