

PN ACF-819
102430

Republic of Armenia

**PETROLEUM SECTOR DEVELOPMENT
GAS SECTOR RESTRUCTURING
MIS SYSTEM**

May 1996

Produced by

**Merklein & Associates
601 Fourth Place, S W
Washington, DC 20024**

Under Subcontract to

**Hagler Bailly Consulting, Inc
1530 Wilson Blvd , Suite 900
Arlington, VA 22209**

Prepared for

**Energy and Infrastructure Division
Office of Energy, Environment and Urban Development
Bureau for Europe and the New Independent States
U S Agency for International Development
USAID Contract CCN-0002-Q-00-3152-00**

TABLE OF CONTENTS

OBJECTIVE	1
THE PETROLEUM PROJECT IMPLEMENTATION UNIT	2
The Armenian Government Position	2
The Oil and Gas Resource Situation	2
Oil and Gas Seminars	3
Current Activities in the Upstream Petroleum Sector	4
Recommended U S Action	5
Reason for Suggested Division of Tasks	5
NATURAL GAS SECTOR RESTRUCTURING	6
Armgasprom Organizational Structure	10
Comparison with Western Organizational Standards	13
Recent Developments in the Armenian Gas Sector	16
Ongoing and Planned Technical Assistance in Gas Sector Restructuring	17
The Snamprogetti Project	18
The Kantor Project	18
The Gaz de France Project	19
Recommended USAID Action	20
STATUS OF MIS SYSTEM	24

APPENDICES

- A - ARMENIAN OIL AND GAS SEMINAR, A NARRATIVE
- B - ARMENIAN GOVERNMENT RESTRUCTURING DECREE

OBJECTIVE

The objective of this three-week trip to Armenia was to

- 1 Assist the newly-formed Petroleum Project Implementation Unit (PPIU) of the Ministry of Energy with defining the objectives of oil and gas legislation,
- 2 Provide advice to the PPIU regarding licensing, oil and gas regulation, and production-sharing contracts,
- 3 Review the various proposals pertaining to natural gas sector restructuring and provide recommendations to USAID, the Ministry of Energy, and Armgazprom on energy gas sector restructuring, and
- 4 Inform USAID and the Government of Armenia on the status of the MIS system procurement and shipping

THE PETROLEUM PROJECT IMPLEMENTATION UNIT

This section covers activities performed with regard to objectives 1 and 2 assisting the newly formed Petroleum Project Implementation Unit (PPIU) with defining objectives for oil and gas legislation and providing advice to the PPIU regarding licensing, oil and gas regulation, and production-sharing contracts

The Armenian Government Position

The Government of Armenia urgently wishes to develop a petroleum sector in the country. The PPIU is charged with this task. Its Head is Dr. Andranik Agabalian, a geologist who was part of the TACIS team (Simon Petroleum Technology {SPT}/PARTEX) that reviewed the Armenian oil and gas potential. The report that resulted from the TACIS work is generally considered a serious and credible assessment of the Armenian petroleum resource potential, following an earlier and somewhat over-optimistic resource definition developed by the California Energy Commission.

The Oil and Gas Resource Situation

The SPT/PARTEX team reports that a considerable amount of exploration has taken place in Armenia, but that the exploratory efforts have simply not been up to Western standards. For example, using gravity surveys and seismic data of relatively poor quality, the siting of wells was done with inadequate structural control. As a result, of a total of 204 exploratory wells only 16 qualify under Western standards as true exploration tests and of those 16 wells, three found non-commercial gas accumulations in Armenia and one well discovered a non-commercial oil pool. Thus, while no commercial oil or gas discovery has been made, the presence of hydrocarbons in Armenia has been proved.

The SPT/PARTEX team succeeded in identifying 29 potential plays in 11 sedimentary basins. Seismic data were available in only three basins. The available seismic data were used to remap the three basins, with the following results:

- In the Oktemberian Basin, 7 prospects and 6 leads were identified,
- In the Near Araks Basin, 4 leads were identified and
- In the Near Yerevan Basin, 4 leads were identified

To the extent that seismic data were available on a sufficiently dense grid pattern, what appeared at first as sizable prospects often times turned out to be complex, multi-fractured and compartmentalized structures. In short, from the seismic and other information available at this time, it appears unlikely that giant oil or gas accumulations such as the Tengiz Field in Kazakhstan or the Azeri-Guneshli-Chirag

Complex in Azerbaijan will be found in Armenia. But there is a definite potential for small to medium-size commercial oil or gas accumulations.

At this point it is clear that exploration for oil or gas is out of the question unless foreign funds can be found. SPT/PARTEX has recommended that the Ministry of Energy set up a Petroleum Licensing Unit responsible for negotiating with foreign oil companies, maintaining a data bank, and making recommendations to the State Minister concerning hydrocarbon policy. They also suggested that the Ministry of Energy make a request for funds to run a promotional campaign to attract international oil companies to participate in hydrocarbon exploration in the Republic of Armenia.

Oil and Gas Seminars

The Ministry of Energy has responded by establishing the Petroleum Project Implementation Unit (PPIU) mentioned earlier. In accordance with objectives 1 and 2 of this mission, a total of three seminars were provided to members of the PPIU. The subject matter covered in these seminars ranged from oil and gas legislation, to regulation and production-sharing contracts. The seminars averaged 3.5 hours in length.

The following seven documents which cover the entire range of petroleum legislation and regulation were provided to the seminar participants, all of whom are associated with the newly-created PPIU. A narrative of the actual seminars is provided in Appendix A.

1 Petroleum Policy, Romania, 1993, 4 Pages

This document is based on Petroleum legislation work that was done for the Republic of Romania. It discusses the national purpose of and rational approaches to petroleum legislation, the required legal framework and infrastructure, petroleum exploration and production activities and their regulation, and model contracts. The document was provided in the English language and, following a request by the participants, in Russian translation.

2 Letter to World Bank Regarding Requirements for Petroleum Law, 6 Pages

The USAID Bechtel Team (Merklein was a member of that team) wrote a letter to the World Bank (Mr. Akin Oduolowu) critiquing the then existing Romanian draft petroleum law and establishing a hierarchy of needs in the petroleum sector including, in decreasing order of importance, a petroleum policy, a petroleum law, petroleum regulations, and model petroleum agreements. This document could serve as an overall guide to the development of Armenian petroleum legislation.

3 The Petroleum Law of 1993, Republic of Romania, 9 Pages

This draft petroleum law was written by the Bechtel team for submission to the Romanian legislature. Much of the law is applicable to Armenia, including the establishment of a one-window regulatory agency to deal with all petroleum matters on behalf of the Government. Some portions of the draft law are not applicable since Armenia does not have an existing petroleum sector to deal with. The draft law was translated into Russian and made available in both English and Russian at the request of the PPIU members.

4 Government of Romania Decision Establishing the Mineral Resources Agency, 4 Pages

The Romanian Mineral Resources Agency, originally proposed by the Bechtel team, is today a self-managed and autonomous Agency in full operation. This document designates the Agency as the Government's exclusive agent of the State to regulate the terms and conditions of, and to enter into, petroleum agreements. The Agency is provided jurisdiction in the areas of liaison with foreign oil companies, oil and gas pricing, payment of royalties by the State Oil and Gas Companies, and general operational regulations.

5 Petroleum Regulations for Romania, 30 Pages

This detailed set of instructions deals primarily with licensing procedures that the Romanian Mineral Resources Agency should be following. It also addresses issues regarding petroleum production agreements, operators' rights, work and financial obligations, and similar issues. It is, in short, an outline of the elements that a full-fledged production-sharing agreement should contain.

6 Model Agreement for Petroleum Exploration and Production Sharing, 80 Pages

This is an actual model production-sharing agreement as developed by the Bechtel team for the Government of Romania. Two of the three PPIU seminars were devoted to a line-by-line, article-by-article discussion of the production-sharing agreement.

7 Petroleum Exploration and Production Regulations, 90 Pages

This is a bound copy of the petroleum exploration and production regulations that were developed by Merklein & Associates in 1995/96 for the State of Kazakhstan.

In summarizing the three seminars, the participants find themselves in the unenviable position of having a Ministerial mandate to develop the petroleum sector in short order, without any background or experience in the field. They found comfort in the exposure to petroleum issues that the seminar provided them. Since they have an unrealistic deadline to develop an acceptable petroleum law, they asked me on the spot whether I could write one in the next two or three days. Actually, with a good petroleum lawyer at my side, I could, not within two or three days, but within a week or two, given the need to engage the PPIU team in the process. However, two very real barriers will have to be overcome to complete the petroleum law in time.

The first barrier is the need to make sure that the proposed law does not clash with existing laws, notably Armenia's recently passed Law on Underground Resources that contains several clauses that would act as disincentives to foreign investment such as the right of the "original discoverer" of any oil or gas accumulation to claim part of the oil or gas that will eventually be produced. The original discoverer might be a geologist or drilling crew that, years ago, discovered trace volumes of oil or gas. This kind of open-ended potential claim will have to be neutralized, either by changing the original Law on Underground Resources (a change in the law requires two thirds approval by the National Assembly), or by having the Government of Armenia provide a hold-harmless contract to the foreign oil investor.

The second barrier to a timely completion of the petroleum law is the fact that the draft law must be approved by the National Assembly to become law, and that will be a difficult and time consuming task that is beyond the control of any advisory team

Current Activities in the Upstream Petroleum Sector

TACIS has extended the SPT/PARTEX contract. The exact terms of reference were not available, since the SPT/PARTEX team members were not in town during Merklein's stay in Yerevan, but discussions with various officials confirm that TACIS was responsive to the SPT/PARTEX suggestion.

Meanwhile, Merklein's lengthy exposure to the PPIU team led to frequent discussions and an outright request regarding the possibility of having USAID participate actively in the development of the Armenian oil and gas sector.

Recommended USAID Action

In his discussions with Dr. Agabalian, Merklein suggested that a reasonable and non-duplicative division of tasks regarding the development of a petroleum sector in Armenia would be as follows:

Let SPT/PARTEX

1. continue their seismic work, including the acquisition of as yet unutilized seismic tapes that are currently held in custody in Belarus,
2. put together an exploratory package for review by potential foreign investors,
3. promote Armenia's oil and gas interests based on the considerable knowledge they have developed in this area.

Let USAID

1. focus on oil and gas legislation, which is absolutely essential to gain the confidence of potential investors,
2. write oil and gas regulations to coincide with those of Western oil-producing countries, and
3. develop a realistic model oil and gas production-sharing contract to reflect Armenia's specific situation geologically and historically, as a new entrant into the petroleum field.

Let SPT/PARTEX and USAID

jointly negotiate the evolving contract with interested oil and gas investors.

Armenia is at a crossroads as regards the development of a petroleum sector. A ready-made infrastructure and pent-up demand in conjunction with an outside embargo of oil and gas make for a ready market. The successful discoverer of oil and especially of gas will be able to invoke appropriate clauses in his production-sharing contract to sell at world prices directly into the Armenian economy, without the need to develop a delivery system to foreign markets. This at a time when existing seismic information has been processed with modern computers. For a virgin oil producing country, Armenia is certainly one of the best explored countries around. With the right incentives, Armenia is now well positioned to determine, once and for all, whether it has a petroleum future.

NATURAL GAS SECTOR RESTRUCTURING

This section covers activities performed with regard to objective 3, which is to review the various proposals pertaining to natural gas sector restructuring and to provide recommendations to USAID, the Ministry of Energy and Armgazprom (renamed Armgasard) on energy gas sector restructuring

Among the Republics of the former Soviet Union, Armenia had one of the highest levels of gas consumption. In the residential sector, gas constituted 83.3% of total energy consumption, including 61.5% of natural gas and 21.8% of liquefied gas. The importation of gas into Armenia originated in 1957, the date at which the Yerevan branch of the Trans-Caucasian Gas Main Department began operations. In 1970 that branch was renamed "Armtransgas Industrial Association" which involved in its structure three regional subsidiaries, the Abovian, Vanadzor and, from 1972, the Goris Gas Main Maintenance Departments. "Armtransgas" was responsible for the importation of natural gas into the Republic and for the operation of the gas main pipeline.

At the same time, the "Armgas State Committee on Gas Supply" was established, whose responsibility was chiefly the distribution of natural gas. A total of 11 urban and regional gas distribution departments were established within "Armgas". In 1974, a new gas sales activity was added when the "Liquefied Gas" industrial enterprise was established, whose task it was to import liquefied gas and to distribute it to regions without gas supply. In addition, Armgas was put in charge of the underground storage of natural gas then under construction in the Abovian Region. The operation of these enterprises was absorbed into the overall structure of the "Armtransgas Association". After several name changes, Armtransgas now operates under the name of "Armgasprom State Concern".

Until 1972, Iran was the source of gas for Armenia. The Iranian gas was transported through Azerbaijan. The subsequent discovery of giant natural gas fields in the former USSR led to the importation of natural gas into the Republic through an interconnected nationwide gas transportation system operating throughout the USSR. At that stage, the Armenian gas supply system allowed the importation of natural gas through three main pipelines from Azerbaijan, which are as follows:

1. Khazakh - Idjevan - Yerevan (1000 mm diameter, approximately 40"),
2. Kransny Most (Azerbaijan) - Alaverdi - Kirovakan - Leninakan (700 mm diameter, approximately 28"), and
3. Yevlakh - Stepanakert - Goris - Sisian - Nakhichevan - Ararat (500 mm diameter, approximately 20")

In 1983, the construction enterprises of "Armgasprom" initiated the construction of the Northern Caucasus-Trans-Caucasus main gas pipeline. That line is the only non-Azeri link to Russian/Turkmenistan gas, through Georgia. The line diameter is 1000-1420 mm (40 - 56"), depending on location. The construction of that vital link to foreign gas was completed in 1993.

In 1988, the conflict between Azerbaijan and Kharabakh brought on the embargo of Armenia by Azerbaijan. Since all import lines ran through Azerbaijan at the time, the disruption of gas deliveries through Azerbaijan plunged Armenia into an economic crisis. In 1991 the disintegration of the USSR deepened the crisis as all economic relations were severed, the markets were redirected and the Republic had to search for a way out. The economic crisis resulted in the near-collapse of industry and a substantial reduction of the incomes and paying ability of the general public. The resulting nonpayment for consumed gas forced further reductions in gas imports. By 1994, gas supplies to the residential sector had to be shut down altogether. The remaining natural gas consumers in the Republic can be grouped as follows:

- the power system,
- the industrial system,
- communal-residential needs (hospitals, schools, etc.)

Gas consumption volumes in the Republic are listed in Table 1, by consuming subsector. As that Table shows, the natural gas industry continues to be in disarray. 1995 deliveries were up from 1994 but, at 1.46 billion cubic meters, they were still less than a quarter of 1989 deliveries.

Table 1
NATURAL GAS IMPORTS AND CONSUMPTION IN ARMENIA

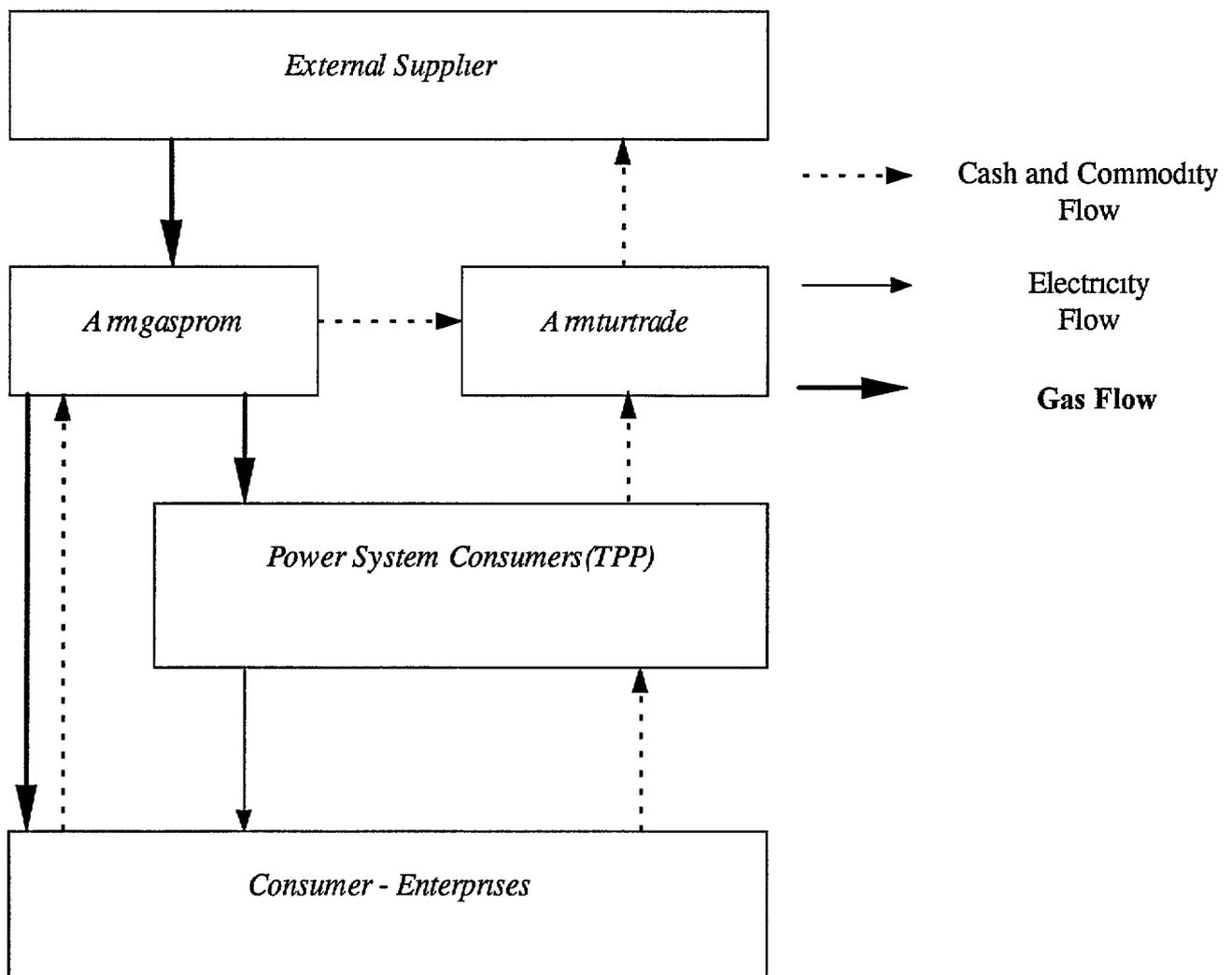
	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Millions of Cubic Meters								
Gas Imports to Armenia	5120	5754	6328	4712	4153	1879	801	868	1458
- Gas Exports	200.2	266.6	308.5	375.3	349.8	76.4	-	-	-
Sales to	4776	5366	5756	4292	3713	1711	768	791.3	1372
- Armenergo	1104	1583	2089	974.6	1025	1073	692	682.4	1175
- Yerevan City District Heating	201.0	198.0	193.7	163.4	95.4	8.4	0.6	7.8	42.0
- Other District Heating	327.8	325.7	268.3	278.8	180.3	7.7	0.01	2.2	14.9
- Residential Consumers	1197	1251	1315	1355	1207	412.4	12.8	-	3.8
- Industry, including	1620	1668	1582	1221	993.2	188.4	59.5	98.9	136.8
Chemical	120.2	113.3	105.6	26.1	39.5	13.0	-	14.8	23.2
Light Industry	79.8	89.5	71.6	58.8	44.8	15.7	-	0.86	1.0
Electro-Technical	119.2	132.2	126.2	125.5	97.7	40.0	-	-	-
Agricultural	97.0	100.0	98.6	85.2	80.4	6.0	-	15.2	19.0
Transport	29.1	30.4	28.6	29.3	21.3	1.7	-	0.2	0.5
Construction	69.1	69.3	70.6	52.0	50.3	7.0	-	0.1	1.9
Armprod Construct'n Materials	206.3	203.2	217.8	114.3	159.6	26.0	-	31.0	50.0
- Hospitals, Schools, etc	325.1	345.6	308.7	299.5	211.7	21.5	16.5	10.0	56.9
- Internal Consumption	29.3	27.0	94.4	20.0	17.1	15.0	-	5.6	7.2
- Losses	118.7	160.5	187.1	149.5	108.7	80.9	-	46.2	67.2

The system as a whole has been, and continues to be, unable to account with precision for sector-by-sector gas consumption since gas meters are installed only at industrial or other enterprises. There is no gas metering in the residential sector. Residential gas consumption had been calculated according to norms established by experts of Armgas SE. These standard gas consumption calculations were performed at the beginning of each year and submitted to the Ministry of Economy, where they were used to estimate individual and collective household gas consumption for the year. It is obvious that such a "metering" system could not meet the more rigorous standards of market-oriented consumption accounting. One of the most urgent prerequisites for the resumption of gas deliveries to

the residential sector is the installation of gas meters for each household or, at a minimum, for each apartment building

In 1994 the Republic of Armenia, in an attempt to secure reliable gas supplies from abroad, signed a Gas Purchase Agreement with Turkmenistan. That Agreement permits Armenia to pay for part of its gas imports through barter which, by now, accounts for 60-75% of the total value of gas imports. At first the commodity bartering was performed by the "Armcontract Trade Agency" within the Ministry of Materials Resources. By 1995 that Agency was made into a State Enterprise, "Armturtrade", and jurisdiction over the enterprise was assigned to the Ministry of Energy. A simplified schematic diagram depicting cash and commodity flows, in addition to gas and electric power flows, and the economic relations between Armturtrade, Armgas, and internal users of gas and electricity is provided in Figure 1.

Figure 1
NATURAL GAS TRADE IN ARMENIA



As shown in Figure 1, the power system consumers (thermal power plants) under the jurisdiction of the Ministry of Energy made payment to "Armturtrade" Enterprise directly. As always, commodity bartering is extremely inefficient and essentially non-transparent. In Armenia, some of the fall-outs of barter trading include substantial non-payments, debt accumulations and a confusing array of cross-indebtedness among various enterprises throughout the Republic.

Armgasprom Organizational Structure

Presently the Armgasprom State Concern consists of 37 organizations with a total staff of 6,550 employees. The functions of Armgasprom State Concern are gas transmission by high-pressure gas pipelines and distribution to consumers, natural gas storage, liquefied gas imports, storage and distribution, sale of compressed gas for motor fuel, construction and operation of pipeline systems, gas equipment manufacturing, etc. The various enterprises within the Armgasprom structure are shown in Figure 2, where the company names reflect changes proposed by the Ministry of Energy. These enterprises can be classified according to operating systems as follows:

1 The Armgasprom Gas Transport System

This high-pressure main pipeline system, the "Transgas State Enterprise", is a constituent part of the Trans-Caucasian gas main system which provides access to natural gas from Russia, Turkmenistan, Uzbekistan, Kazakstan, Azerbaijan, and Iran. At present gas is supplied to the Republic almost exclusively from Turkmenistan and rarely from Russia through Georgia. The operating capacity of the Northern Caucasus-Trans-Caucasus system is 50 million cubic meters per day, enough to meet the combined gas demand of Georgia and Armenia.

The gas main inside the Republic is 1918 km in length. There are 67 pressure reduction/gas distribution stations. The design pressure of the pipelines is 50 ATMs. As mentioned, the Armgasprom transport system is subdivided into the following three regional systems:

- 1 The Abovian Division (Abovian city, 106 employees),
- 2 The Goris Division (Goris city, 106 employees), and
- 3 The Vanadzor Division (Vanadzor city, 125 employees)

The main pipeline system is in an advanced stage of deterioration. As a result, the system operates at half capacity. The working pressure of the pipelines is 15-40 ATMs. Inadequate maintenance of gas meters causes readings to deviate from actual throughput volumes by 2.5-10%, compared to an admissible tolerance of 0.5%-5%.

2 The Armgasprom Gas Distribution System

The gas distribution system in the Republic of Armenia consists at present of 10 Armgasprom daughter enterprises including Yerevan, Gumri, Vanadzor, Hrazdan, Idjevan, Armavir, Ararat, Kapan, Kamo, and Spitak. Cathodic protection is installed throughout the system, but whether it is operational or not is an open question. The Armgasprom "Anticorrosion State Enterprise" is in charge of protecting the system which is in a critical situation because of electric outages which render the cathodic protection system useless and the deterioration and wear of the surface gas facilities.

Current gas deliveries are made to industrial and agricultural enterprises, to municipal facilities, and to the power sector. In the residential sector, only a few villages receive gas. The resumption of gas deliveries to the population is a high priority.

3. The Armgasprom Gas Storage System

Seasonal continuity and reliability of gas deliveries are provided by the Armgasprom storage system which is shown in Figure 2 as a Division of the Transgas State Enterprise. The underground gas storage facility in the Abovian District is built into a salt stratum and has 18 underground reservoirs with 1.7 million cubic meters of total physical volume. At maximum design pressure, the storage facility will hold 250 million cubic meters of gas, for a net working volume of 210 million. The construction of eight additional reservoirs with a total volume of 1.2 cubic meters was started but never completed. If the construction of these additional reservoirs had been completed, the total net storage capacity for natural gas would be 340.0 million cubic meters.

The compressor station at the storage facility is in disrepair. It is an open question whether the compressors can be repaired cost-efficiently, since the repair will involve very significant expenses but will do nothing to reduce high current operating expenses. A complete overhaul or even the replacement of the existing compressor stations may be more cost-effective. Another problem associated with the salt storage facility is the disposition of waste brine in an environmentally benign and acceptable manner.

4 The Armgasprom Liquefied Gas Supply System

Liquefied gas is imported into Armenia by private entrepreneurs and by the Armgasprom Industrial Regasification and Sales daughter enterprise, shown in Figure 2 under the name of "Butane Liquid Gas State Enterprise". The firm is headquartered in the City of Abovian and has a total of 87 employees. Liquefied gas storage facilities are located at selected sites throughout Armenia. They consist of a central 50,000 cubic meter underground facility (for a storage capacity of 25.5 tonnes of butane) and a total of 4,000 cubic meters of above-ground metal tanks that are located at various sites in Armenia.

This daughter enterprise once operated a German-built facility to regasify butane by mixing it with appropriate amounts of air. This butane-air mixture had a thermal content equivalent to that of processed natural gas. It was injected into pipelines and delivered to distribution systems in lieu of natural gas whenever a gas shortage arose. However, with natural gas selling at world prices, the mixing of air and butane has become prohibitively expensive and the mixing facility is no longer in use.

Overall, the liquefied gas supply system is in satisfactory working condition, but in a year or two its equipment is expected to deteriorate to the point where the enterprise will face serious problems.

5 The Armgasprom Motor Transport Re-fueling System

This system ("Automotive Gas State Enterprise" in Figure 2) sells compressed gas as a motor fuel. This is the most profitable and efficient system in the gas sector since natural gas sells at about half the price of other fuels. There are five operating re-fueling stations in the motor transport re-fueling

system, two at Yerevan and one each at Vanadzor, Hrazdan, and Gumri. Each of these stations is designed for a storage capacity of approximately 250 days of sales. Additional unfinished stations are located in Armavir, Echmiadzin, Ararat and Idjevan. The completion of these non-operating stations and the installation of new compressors at the operating re-fueling stations will enable the system to carry out the re-fueling process when the pipeline pressure is low (0.5-4.0 ATMs). High-pressure motor fuel tanks operate at a pressure of 6 ATMs when full.

6 The Armgasprom Industrial System

The industrial system within Armgasprom SC is primarily engaged in the production and maintenance of gas equipment. This task is considered important by the Government in the face of the current energy embargo. The following production companies operate in the Concern:

- The Gas Meter Joint Enterprise with participation of the Slovakian "Khiran" Joint-Stock Company has branches in Idjevan and Vanadzor. It has approximately 250 employees and produces gas meters, gas pressure regulators and spare parts,
- The Vanadzor Gas Equipment Manufacturing State Enterprise has approximately 75 employees and produces spare parts for gas equipment, water regulators, thermoregulators, stove regulators, etc.,
- The Armavir Gas Equipment State Enterprise has about 150 employees and produces welding machines, oil-processing equipment, and equipment for the construction and maintenance of gas pipelines,
- The Kazmgas Lease Company has 11 employees. The company produces gas burners and spare parts for gas regulators. It is now a joint stock company with 20% private ownership.

As mentioned earlier, one prerequisite for the resumption of gas deliveries to the residential sector will be the installation of gas meters at each apartment. The production of residential gas meters would likely take place at the Gas Meter Joint Enterprise provided residential gas deliveries resume and the required investment is obtained. The total market potential of 440,000 meters can be met by the plant in the period of 1996-1998.

7 The Armgasprom Construction System

There are two pipeline construction companies within the Armgasprom system. One of these, the Transgas Construction State Enterprise specializes in the construction and maintenance of high-pressure trunk lines and the other, Armgas Construction State Enterprise, works with medium and low pressure distribution systems. These two companies have at their disposal relatively modern if deteriorated trucks and machinery, among them American and Japanese equipment.

In recent years, the high-pressure construction company has taken on foreign construction projects in the Ukraine, Asia, and Georgia, to offset the absence of important orders in Armenia. Wear and tear of machinery and the shortage of spare parts caused considerable problems in this system. It would take the company about US\$ 1.0 million to repair the foreign equipment and to return to operations with its former efficiency.

Also part of the Armgasprom Construction System is the Construction Material State Enterprise that specializes in trenching and pipe coating operations

8 Other Armgasprom Affiliates

Included among those are a central "Vehicle Maintenance State Enterprise" charged with repairing and maintaining all Armgasprom vehicles, a Training Center that serves essentially the Transgas and Gas Distribution State Enterprises, a "Central Procurement State Enterprise" that serves as a purchasing agent for the entire system, and various minor companies some of which are relics from the old social system, such as the Bazum Agricultural Subsidiary which produces farm products for company employees, the Commodity Procurement for Employees State Enterprise that does the same with non-farm products, the ANI Kindergarten, and the KARIN Resort Facility which currently serves as a refugee center

Comparison with Western Organizational Standards

Some of the apparent anomalies, compared to market-oriented privately-owned gas transmission/distribution corporations, include the existence of two separate construction and maintenance companies. In the West, pipeline construction work is typically performed by contractors. Routine maintenance and repair work is done, especially in distribution networks, by specialized divisions that are located in the individual distribution companies.

As mentioned, the Commodity Procurement State Enterprise, the Karin Resort Facility and the ANI Kindergarten cover unrelated activities that are in part left-overs of the old centrally regulated regime that typically aimed for maximum economic self-containment. With the possible exception of the Automotive Gas State Enterprise which maintains a network of compressor stations across the county to fill the high-pressure gas tanks on top of utility vehicles, especially buses, most of the other State Enterprises would be separate enterprises in the West, and they should be reviewed with such a separation and privatization in mind.

Gas sales to residences, industry, power plants, and other customers are listed, by distribution district, for the peak year 1989 and for the latest available full year, 1995, Table 2. Also listed, where available, are estimates of the percentages of successful collections and numbers of consumers (not including residences) and employees. For the Yerevan Distribution Company, for example, total sales were 2.37 billion cubic meters in 1989, compared to 425 million cubic meters in 1995. That is less than 20% of consumption in the peak year. Of that 1995 total, deliveries to residences were for all practical purposes zero. Percentage collection, nearly 100 per cent for all distribution companies in 1989, had dropped to 21% in Yerevan in 1995. This kind of information will be useful in future restructuring decisions when the issue will invariably come up whether and at what level to maintain existing distribution networks.

Similar information is presented in Table 3 for the three trunkline regions. As it turns out, there have not been any direct deliveries from trunklines to power plants in the pre- or post-revolution years. Also, the Goris Region is, for all practical purposes, shut down, yet it maintains its employee strength at 70% of the 1989 peak year.

TABLE 2

ARMGASARD DISTRIBUTION COMPANIES

Gas Sales to	YEREVAN CITY DISTRIB COMPANY				GUMRI CITY DISTRIBUTION COMPANY			
	1989		1995		1989		1995	
	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect
Residences	210 9		0 2	N/A	130 5		0	N/A
Industry	634 4		61	N/A	49 8		1	N/A
Power Plants	1220 8		320	N/A	0		9	N/A
Other	300		44	N/A	30 1		0	N/A
Total	2366 1	98%	425	21%	210 4	95%	10	13%
Nbr Consumers (a)	730				140		12	
Nbr Employees	996				510		235	

NOTE (a) does not include Residences

Gas Sales to	ARARAT REGION DISTRIB COMPANY				IDJEVAN CITY DISTRIBUTION COMPANY			
	1989		1995		1989		1995	
	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect
Residences	146 0		0	N/A	133 9		0	N/A
Industry	129 0		32 3	N/A	63 6		1 1	N/A
Power Plants	0		0	N/A	0		0	N/A
Other	65 1		1 4	N/A	37 9		0 4	N/A
Total	340 1	95%	33 7	40%	235 4	90%	1 5	46%
Nbr Consumers (a)	167		21		160		16	
Nbr Employees	430		217		580		258	

Gas Sales to	KAPAN CITY DISTRIBUTION COMPANY				HRAZDAN CITY DISTRIB COMPANY			
	1989		1995		1989		1995	
	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect
Residences	24 8		0		191 3		3 4	N/A
Industry	39 9		0		402 2		17 2	N/A
Power Plants	0		0		732		836 4	N/A
Other	35 1		0		155 8		11 1	N/A
Total	99 8	96%	0		1481 3	94%	868	1 6%
Nbr Consumers (a)	34		0		282		43	
Nbr Employees	374		183		468		349	

Gas Sales to	VANADZOR CITY DISTRIB COMPANY				GAVAR REGION DISTRIB COMPANY			
	1989		1995		1989		1995	
	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect
Residences	160		0	N/A	160		0 1	N/A
Industry	56 6		2 6	N/A	46		0	N/A
Power Plants	136 5		9 4	N/A	0		0	N/A
Other	44 8		0	N/A	34		0	N/A
Total	398	97%	12 0	19%	240	98%	0 1	94%
Nbr Consumers (a)	280		15		340		1	
Nbr Employees	728		279		366		180	

Gas Sales to	SPITAK CITY DISTRIBUTION COMPANY				ARMAVIR REGION DISTRIB COMPANY			
	1989		1995		1989		1995	
	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect	10 ⁶ CM	% Collect
Residences	2		0	N/A	156		0 1	N/A
Industry	0 3		0 1	N/A	160		15 9	N/A
Power Plants	0		0	N/A	0		0	N/A
Other	1 9		0	N/A	65 5		0 1	N/A
Total	4 2	97%	0 1	90%	381 5	97%	16 1	40%
Nbr Consumers (a)	20		1		210		13	
Nbr Employees	34		116		618		323	

TABLE 3

ARMGASARD TRUNK LINE COMPANIES

Sales to	ABOVIAN REGION		VANADZOR REGION		GORIS REGION	
	1989	1995	1989	1995	1989	1995
	10 ⁶ CM					
Distribution Company	4809	1343	848 2	235 1	99 8	0
Nbr Employees	192	202	136	130	135	94

TABLE 4

STATE ENTERPRISES

	Production, %		Nbr Employees	
	1989	1995	1989	1995
TRANSGAS CONSTRUCTION SE	100%	22%	1253	659
ARMGAS CONSTRUCTION SE	100%	2%	1038	438
AUTOMOTIVE GAS SE (a)	100%	150%	149	130
CONSTRUCTION MATERIALS MF SE	100%	10%	420	193
VANADZOR GAS EQUIPM SE (b)	100%	78%	N/A	51
GAS METER JOINT ENTERPR (b)	100%	19%	284	186
ARMAVIR GAS EQUIPMENT SE (b)	100%	28%	N/A	138
BUTANE LIQUID GAS SE	100%	35%	252	138
KAZMGAS SE	100%	N/A	133	130
CENTRAL PROCUREMENT SE	100%	25%	N/A	35
ANTICORROSION SE	100%	4%	353	177
BAZUM AGRICULTURE SUBSID	100%			
OTHER ENTERPRISES				
TRAINING CENTER	100%	N/A	26	12
COMM PROCUREMENT EMPLOYEES	100%	5%	32	63
ANI KINDERGARTEN	100%	100%	56	43
	Nbr Vehicles (c)		Nbr Employees	
	1989	1995	1989	1995
VEHICLE MAINTENANCE SE	800	200	1187	472

NOTES (a) - Company Established in 1991, percentage and employees shown for 1991
(b) - Company Established in 1992, percentage and employees shown for 1992
(c) - Estimated
N/A - Not Available

Table 4 lists the various Armgasard State Enterprises and their estimated levels of activity for 1989 and 1995. For example, the Armgas Construction Company has essentially been shut down but maintains 438 employees. The one and only growth company has been the Automotive Gas State Enterprise which now sells 50% more compressed gas to utility vehicles than it did when it was founded in 1991, and with fewer employees. Again, these are not hard and fast figures, but hard and fast figures do not exist. This is about as good a set of information of past and present activities of non-gas Armgasprom companies as can be had, and it will prove useful in deciding whether and where to effect separations from the parent company.

Recent Developments in the Armenian Natural Gas Sector (since August 1995)

The World Bank has continued its efforts to speed the gas sector on its way towards eventual privatization. A draft report dated November 17, 1995, suggests, as a condition for negotiations, that the Government of Armenia designate Armgas as the only **state owned or controlled** (their emphasis) entity authorized to procure gas, but leaving private buyers free to import gas directly, paying Armgas for transmission, storage, and distribution services at rates to be set by the Government, and eventually by an independent commission.

The World Bank draft report also envisions the setting up of a separate settlement account for the purchase of gas, as a means of imposing financial discipline. Start-up funds for this account are to be provided by short-term Government credit. Once in operation, the account is to be replenished solely from payments received from consumers, constraining Armgas to purchase gas only in so far as it can pay for it from the special settlement account. The draft report also calls for the elimination of state guarantees for gas imports. These actions, according to the World Bank, were to be taken before January 1, 1996.

Among actions to be taken before February 1, 1996, the World Bank called for the issuance of a Government Decree incorporating the conditions outlined above. On December 27, 1995, Decree Number 361, which is reproduced in informal translation in Appendix B, was issued by the Prime Minister to meet the conditions stipulated in the World Bank report. The formal provisions of Decree Number 361 provide that

- The Armgasprom State Concern is the sole authorized utility which has the right to import natural gas into the Republic,
- The Government of the Republic of Armenia assumes no economic liability and gives no warranties to ensure natural gas imports and payments,
- The Armgasprom State Concern has permission by the guarantee of the Government of the Republic of Armenia to use credit in the amount of US\$ 60 million to purchase natural gas, and
- The Ministry of Energy will submit to the Government a proposal regarding the structural improvements of the Armgasprom State Concern and the Armturtrade State Enterprise.

In its Letter of Development Policy for the Republic of Armenia, the World Bank addresses natural gas barter trade and stipulates that the Government refrain from interfering in gas-related barter and that it allow gas importers to operate only on a commercial basis. Recognizing the need for a structural adjustment of the economy to a market basis, a critical restructuring of the gas subsector is called for.

With regard to monopolistic energy markets in general, the document stipulates the adoption, by May 1, 1996, of an energy law that will assure the commercialization and privatization of sector corporations, the facilitation of foreign private investment, and the definition of the role of an independent regulator in the energy sector. By July 1, 1996, a regulator is to be appointed within the Government, and he or she is to become independent by December 31, 1996. The task of the regulator will be to set tariffs, monitor the quality of supply, issue licenses, and ensure access to gas transmission lines and storage facilities by third parties.

These World Bank efforts are supported by parallel actions of USAID which, on May 6, 1996, signed a \$15 million gas purchase agreement with the Government of Armenia, but with certain stipulations regarding Armenian moves towards free markets. In the gas sector, the agreement calls for the Ministry of Energy to develop and approve a natural gas restructuring plan and implementation time table during the second quarter of 1996. The plan stipulates that the gas transmission, storage, and distribution functions be separated and that joint stock companies be formed to implement them.

The Ministry of Energy has responded to World Bank and USAID suggestions by designing a restructuring plan for the natural gas sector. This plan calls for the establishment of a natural gas importing and transmission company ("Armgasard" State Concern) and a separate natural gas distribution State Enterprise. Beyond these two main gas enterprises, several of the dependent enterprises are re-shuffled and some have their status changed from Daughter Enterprises to State Enterprises, but there are no visible eliminations or mergers of subsidiaries. The entire system is to be held together by an "Authorized Management Enterprise" that has the faint ring of a US holding company, without of course the equity holdings implications that would be present in the United States. Overall, the plan does not entail a deep reorganization of the natural gas sector, so that its ultimate rejection by the Prime Minister's office comes as no surprise.

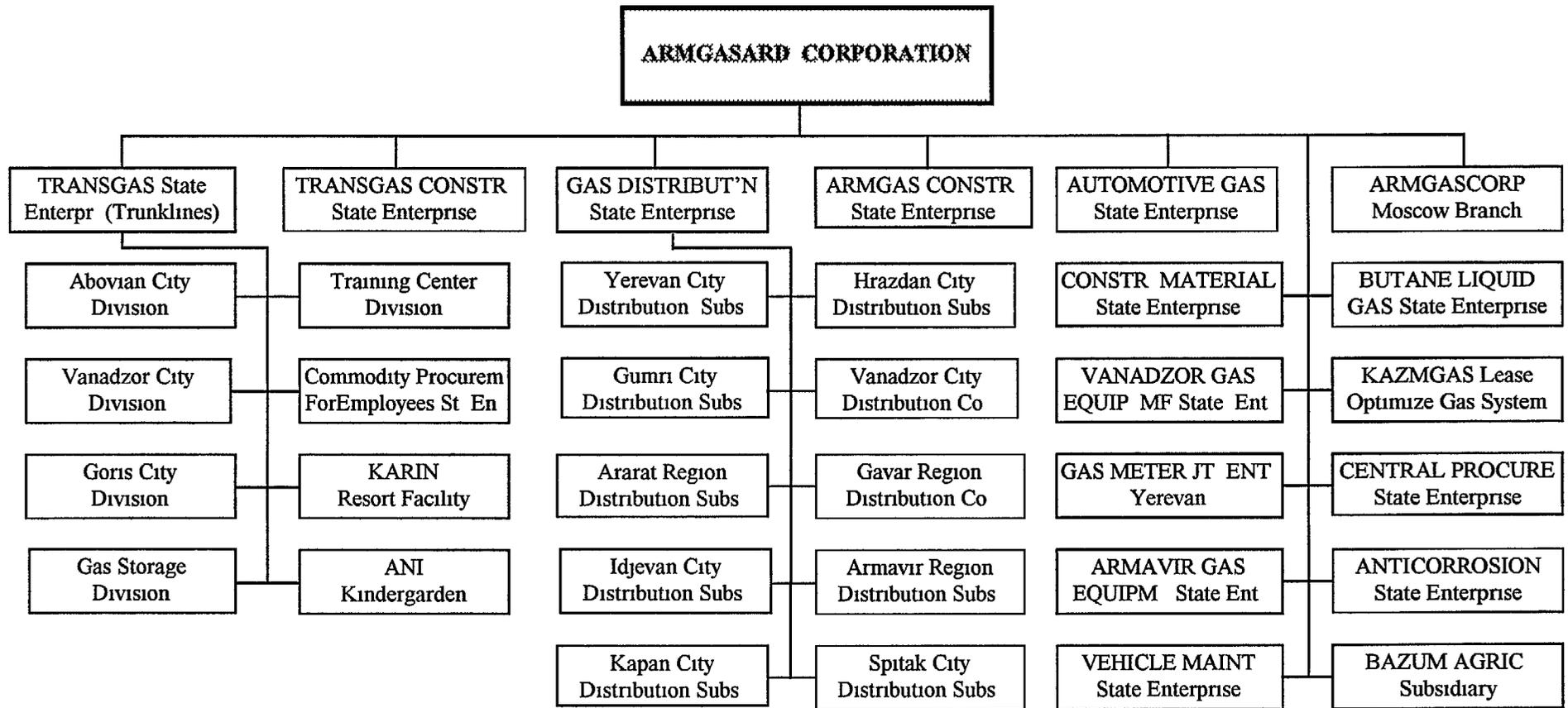
Other restructuring plans have been floated in the gas sector, notably one that was put out by Armgasprom and that reflects their vision of what the Government would need or want. That plan leans on the Ministry of Energy plan that has just been obsoleted by the Prime Minister, so its life as a credible guide for future action appears to be limited. Still, since the plan lends itself to schematic representation it is reproduced here as Figure 2.

The organizational diagram of Armgasard shown on the following page is highly interpretive and possibly inaccurate in places, but it has the virtue of showing all the constituent parts that today make up Armgasard. As mentioned, the two principal companies within the Armgasard Corporation structure are the high-pressure trunkline transmission company, Transgas State Enterprise, and the Gas Distribution State Enterprise.

Finally, the Natural Gas Import Agreement was concluded in 1996 between Armgasprom State Concern and "ITERA", a Turkmen-Russian-American Shareholding Company. Unlike earlier gas purchasing agreements, this one stipulates definite terms of payment.

Ongoing and Planned Technical Assistance in Gas Sector Restructuring

There are at present three separate TACIS projects under way or about to be started in the Armenian natural gas sector. These are



1/25

- 1 the Snamprogetti "Gas Pipeline Testing and Rehabilitation Project",
- 2 the Kantor "Armenian Energy Sector Review of Pricing, Financing & Collection Arrangements for the Supply of Gas", and
- 3 the "Gaz de France Technical Support for the Restructuring of the Gas Sector in Armenia"

THE SNAMPROGETTI PROJECT is essentially a technical project that does not deal with structural issues. Its objectives are to determine the structural integrity of the main gas pipelines, to specify repairs and technical improvements in the gas distribution network, to develop an overall rehabilitation plan for the entire system, and to undertake a pilot demonstration for the rehabilitation of a selected section of the Yerevan distribution network.

Work has begun on this 1.4 million ECU one-year program. An office has been established at the Energy Center. With regard to the high-pressure transmission line, a section has been selected for testing by inspection, by pressure tests, and with the use of an intelligent pig. The distribution network in Yerevan is being reviewed at this time for the selection of a suitable city block where about 100 residential gas meters will be installed for the purpose of testing the feasibility of a metering/collection pilot program. The results of both pilots will be used to estimate the cost of rehabilitating the entire natural gas system and to develop a detailed rehabilitation plan.

Given the technical nature of this work, the Snamprogetti Project will have only a marginal impact on the restructuring efforts currently under way or contemplated.

THE KANTOR PROJECT does get into management areas, but does not specifically address natural gas sector restructuring issues. The study consists of three interrelated tasks which are to be pursued in parallel. They are:

- 1 A review and analysis of the gas billing and collection system,
- 2 A review and analysis of gas tariffs, and
- 3 Information dissemination

The gas billing and collection task will entail a review of the current situation, including procedures, performance, staffing, organization and responsibilities, support tools, and process management. Included will be visits to selected European countries, including Central/Eastern European countries, to examine how they have dealt with billing and collection arrangements. This will be followed by the identification of areas in Armenia where improvements are likely to be effective, by an analysis of alternative options for improving the gas sector billing and collection performance, by the selection of the most suitable option and, finally, by a seminar on billing and collection where the TACIS findings will be presented. All of this will result in a gas billing and collection plan that will include a spreadsheet type management reporting system to monitor the billing and collection process. Information requirements will be identified, but a LAN system is not included in the project.

The gas tariff task will involve a review of the current situation and an analysis of international experiences, similar to the billing and collection task. This will be followed by the development of a tariff setting model based on long run marginal costs. A small scale household survey will be run to determine gas consumption needs, coupled with a pilot installation of a small number of meters in

households that currently receive gas to determine differences from the norms currently in use, the impact of trade-offs for electricity, and general consumption patterns

This work will result in proposed tariff structures which will be analyzed for their financial viability and their impact on the consuming public. Necessary investments in information, accounting and support systems will be identified, but the systems themselves are not part of this task. Again, the results of this work will be presented in a formal seminar.

The information dissemination task will entail a one-week study tour of three Ministry of Energy and Armgasprom officials to visit gas utilities in a European country. This will be followed by an information campaign that will be primarily handled by Armenian counterparts.

THE GAZ DE FRANCE PROJECT is budgeted at 1.0 million ECUs and has a total effort level of 22 person-months over the period of one year. Its four objectives are as follows:

- 1 Identify a rational and modern organization structure for the gas sector and provide the Government with an appropriate restructuring plan,
- 2 Establish a suitable framework for the development of the private initiative in the gas sector,
- 3 Provide Armgasprom with a modern system for the control and operation of the transport network,
- 4 Upgrading of the infrastructure already constructed.

Gaz de France is the lead contractor, with SODETEG and PARTEX as subcontractors. They will be establishing an office at the Yerevan Energy Center. The on-location project responsibility will be with as follows:

- Sodeteg for items (1) and (2), Erno Morbitzer, Resident Manager and Team Leader,
- Partex for items (3) and (4), Kaliguzzman Katchi, Task Manager.

The terms of reference do not envision the eventual privatization of the "strategic activities of gas supply and transport". The tender document states that "the supply of gas is strategic and the gas sector has, therefore, to be rationalized in order to support the efforts of the Government for the economic development of the country. Armgasprom, as other similar concerns established under the SU, is a large and diversified group of enterprises under state control and requires to be restructured to focus on the strategic activities of gas supply and transport and **privatize the non-strategic ones**" (emphasis added).

In short, there is no language to suggest that the principal gas activities, importing, transmission, and distribution will ever be privatized. These being strategic functions, they only need to be rationalized (i.e., restructured and made more efficient under State Ownership) while the other activities (those on the right of the preceding organizational diagram) need to be spun off from Armagazprom and privatized. This is a major disconnect from World Bank and USAID objectives.

The following four actions are identified in the terms of reference. They include

The development of a restructuring plan for the Armgazprom State Concern, including the identification of non-strategic activities to be privatized, and the development of a gas tariff strategy. A verbatim description of what is included in this action follows:

- Analysis of the Armgazprom organization structure, evaluation of the activities and performance of the different units and enterprises covering manpower, infrastructure, available operating and production facilities, technology and operating procedures, assets, financial situation, and legal status
- Identification, in concert with the local authorities, of the activities to be considered strategic for the development of the sector and the non-strategic activities to be eventually privatized and/or eliminated
- Elaboration of a restructuring plan for Armgazprom to improve and adapt the organization to manage and operate its strategic activities, including introduction of new financial and accounting arrangements, development of a Management Information and Control System, reorganization of employment, analysis of wages and salaries systems and suggestion for improvement
- Analysis of the gas supply, transport, and distribution costs, including underground storage, and elaboration of a strategy plan for gas tariffs. Elaboration of a Business Plan for the re-organized structure
- Elaboration of a privatization plan for non-strategic activities, including
 - 1 definition of the relevant development strategies, legal framework, and privatization procedures,
 - 2 identification of potential local and/or foreign industrial/financial partners,
 - 3 preparation of a time schedule of the privatization plan with indication of the actions to be undertaken by the Government, Armgazprom and other concerned Authorities for the implementation

Upgrading of the five industrial enterprises manufacturing equipment for gas distribution and uses and assist in the negotiations with relevant foreign partners and potential joint venture partners for the improvement and modernization of the production processes, including introduction of API standards. A detailed description of the tasks to be undertaken in connection with the five industrial enterprises includes an analysis of their organization, evaluation of their products, assessment of local and other CIS markets, identification of prospective joint-venture partners, and others.

Design of a safe remote-control system for the gas transmission and storage facilities of Armgazprom and development of a computer model for the main gas pipeline network. This is essentially a technical function and, therefore, of lesser importance in the context of the present review of ongoing or planned restructuring efforts.

Upgrading or disposal of the Abovian LNG plant whose construction has been stopped. This, too, is a technical function and of little importance here.

The disconnect with World Bank and USAID thinking in this project is due to the fact that restructuring and eventually privatizing the natural gas market is a conditionality in the US/Armenia

Memorandum of Agreement (MOA) that provides for the purchase of \$15 million worth of natural gas for Armenia (it is also a World Bank conditionality on related energy sector commitments) That amount is to be monetized and eventually used for energy sector development activities

When the MOA was being negotiated, Ministry of Energy officials did not mention that this TACIS project was under development and that it did not include plans to privatize the gas transmission and distribution companies Nor was USAID told that Gaz de France, hardly a champion of private enterprise, would be given the overall lead responsibility on this project

Recommended USAID Action

USAID has steadfastly pursued a course that envisions the eventual privatization of the Armenian natural gas sector The TACIS terms of reference do not require such a course of action, and the winning contractor, Gaz de France, will almost guarantee that all but the peripheral manufacturing enterprises will remain under state ownership

We believe that USAID would be well advised to seek clarification on the state versus private ownership issue This clarification will probably require discussions with at least three parties TACIS, Gaz de France, and first and foremost, high-ranking officials of the Armenian Government The Prime Minister's office comes to mind since it made a forceful statement in rejecting the Ministry of Energy's restructuring plan

On the assumption, though, that the eventual privatization is the Government's ultimate objective, we would suggest the following restructuring actions, subject to review and confirmation by an in-depth analysis of all relevant factors

- That any attempt to privatize individual enterprises of the Armenian natural gas sector be preceded by a corporatization program that would entail the setting up of separate and independent management and profit centers of the companies destined for ultimate privatization, at least for the major enterprises such as the larger manufacturing concerns and construction companies This may well involve a limited interim period of 51% state ownership, say for one or two years
- That privatization, when it occurs, be done in such a way that shares be given to employees on a pro-rata basis for all privatized companies This will eliminate major opposition by a substantial segment of the natural gas sector that, right or wrong, feels it should have equitable claims on the present or prospective wealth of all sector companies
- That the Transgas State Enterprise remain intact as one unit throughout Armenia, with or without (and preferably with) the current structure of three subdivisions, that the right to negotiate natural gas imports be transferred to Transgas, and that Transgas fall under the jurisdiction of an independent regulatory authority
- That Armturtrade be phased out as Armenia's exclusive gas import agency

- That the Gas Storage Division be retained by Transgas State Enterprise, but as a separate cost center, so that the storage of natural gas can eventually be brought into the calculation of gas tariffs
- That the Gas Distribution State Enterprise be dissolved and that the ten Gas Distribution Subsidiaries become independent companies, also subject to regulatory controls by an independent authority. It is difficult to see how the Gumri City Distribution Company could possibly benefit from a close association with the Yerevan City Distribution Company
- That the construction firm Transgas Construction State Enterprise be corporatized with a view to spinning it off after a year or so of operation as an independent profit center
- That the construction firm Armgas Construction be absorbed in pieces into the various active Distribution Companies where they will become maintenance divisions
- That the Vehicle Maintenance State Enterprise and the Anticorrosion State Enterprise be similarly absorbed as maintenance divisions in currently active Distribution Companies
- That the Automotive Gas State Enterprise be privatized after a short period of corporatization
- That the Butane Liquid Gas Enterprise become an independent company, subject to continued competition with private sector imports of natural gas liquids
- That the five manufacturing plants (Construction Material State Enterprise, Vanadzor Gas Equipment Manufacturing State Enterprise, the Gas Meter Joint Enterprise, Armavir Gas Equipment State Enterprise, and the Kazmgas Lease Enterprise) be spun off and privatized
- That the Training Center be re-established as an industry-wide training and research center, similar to the U.S. Gas Research Institute which is supported by fractional levies on the gas tariff
- That the procurement of company supplies be made internal to the transmission company and the individual distribution companies
- And that the socialist hold-over establishments (the Bazum Agricultural Subsidiary, the Commodity Procurement Company for Employees, the KARIN Resort Facility, and possibly the ANI Kindergarten) be spun off or terminated

These actions require the careful establishment of transition plans and they also require technical support in managerial areas such as budgeting, accounting, billing, the establishment of revolving short-term and long-term management plans, and so on. These efforts are impossible to perform in any meaningful way without the use of advanced planning tools, especially computers and management information systems. The acquisition of and training in the effective use of management information

systems will go a long way in assisting the companies in moving into and surviving in the uncertainties associated with market environments

We have not had an opportunity to visit with individual distribution companies, but if the example of the current headquarters of Armgasprom State Concern is indicative of their present level of modern-day computer utilization, they do indeed need assistance in this area. Armgasprom had only one computer, and that one without any software, except for a word processor. Their computer, as far as we could tell, did not have a spreadsheet.

STATUS OF MIS SYSTEM

This section covers activities performed with regard to objective 4, to inform USAID and the Government of Armenia on the status of the MIS system procurement and shipping

The MIS system arrived in Yerevan on May 5, 1996. The mechanical elements of the system have been moved to the Ministry. By May 15, all conduits had been hung in the hallways and most in the individual offices, and the designated LAN room is in the process of being rehabilitated (floors have been sanded and coated with acrylic, and the room is currently being re-painted). Additional preparations include the provision of a grounded 220V circuit which is not generally available in the Ministry. We do not have the resources to rewire the entire Ministry, but we do need to provide grounding in the LAN room where the central electronic controls and the data base will reside.

The entire Ministry will be provided with wiring for computers, in a star configuration, so that at some later point in time additional computers can be brought into the system without the need to shut down operations. Similarly, computers can be unplugged and moved to other rooms with this kind of design without any disturbance to the overall system.

We have learned to be cautious in making time projections in Armenia, but we are planning to have our technicians arrive in Yerevan around May 29 to connect the wires that will by that time have been strung by an Armenian team of technicians lead by Dr. Yuri Orbelian. That operation will take no more than a week, followed by a week of balancing the system and working out minor bugs. We do not expect major problems on the electronic side since the system had been pre-assembled and tested in the United States prior to shipment. By Mid-June the system will be operational. At that time one of our two technicians will return to the States, while the other will remain a week longer to train the designated LAN managers who have taken a USAID-funded NOVELL course in Moscow in preparation for this task. The LAN managers in turn will be providing training courses to Ministry personnel.

Helmut Merklein will remain in Yerevan for at least one week following installation of the system to provide training on the data side of the system. We plan to have an official dedication (and demonstration) ceremony in Mid to late June and we hope to have officials of the US Embassy and USAID present, in addition to Armenian Government officials, to formally turn over this tangible piece of US foreign aid to the Armenian Government.

APPENDIX A

ARMENIAN OIL AND GAS SEMINAR

A NARRATIVE

Pre-Seminar Meeting

At a first pre-seminar meeting with Dr Agabalian, we talked about oil and gas infrastructures. I mentioned the need for a sweeping policy statement, preferably from the Head of State, that would provide the impetus and develop internal political support for the creation of an oil and gas law. That law, which should itself be relatively broad, would set the stage for detailed rules and regulations that would be needed to guide the industry in its day-by-day operations. I pointed out that the combination of a law in conjunction with detailed regulations would provide greater operational flexibility for the industry since adaptations following unforeseen developments or evolving technologies would not need full legislative sanction which, depending on the political circumstances of the time, might not be easy to obtain.

I also discussed the broad outlines of production-sharing contracts. Dr Agabalian was very interested in those, so we arranged for a three-hour seminar for him and five of his immediate associates on this topic. Since it was difficult to find a mutually convenient time slot for all concerned during the week, we agreed to meet at the Hagler Bailly offices on a Saturday.

First Seminar

All petroleum seminars were limited to members of the Petroleum Project Implementation Unit of the Ministry of Energy. The first seminar dealt exclusively with an actual model contract which a USAID team, under contract with Bechtel, had developed for Romania. I was a member of that team and had had substantial input into the exploration and production contract. An English-language copy was made available to each team member, and the presentation was done with sequential translation into Russian. While any real production-sharing contract is likely to use English as the operative (and legal) language, I would suggest that as part of any technical assistance in the area, this model contract be translated into Russian and used as a basic instruction tool for the PPIU members and CIS units in other countries.

The material we attempted to cover, some 80 single-spaced pages of tightly written legal and financial text, turned out to be too much to digest in one session, especially in view of the intense interest the PPIU team members exhibited during our discussions. There were frequent questions, which I found gratifying since they indicated that these participants took the seminar very seriously. We covered about 75% of the material and disbanded with a commitment to meet again and to finish the contract discussion at the second seminar. We also agreed on additional topics to be covered at the next meeting, especially oil and gas law issues, permitting procedures, and petroleum exploration and production regulations. Our discussion of oil and gas laws and permitting procedures will be based on the Romanian models, copies of which I had brought along, while the regulatory system will be based on our recent work in Kazakstan where we had put together and bound in one volume a complete set of exploration and production regulations, based on Texas and Kansas regulations.

The PPIU members are all new to petroleum operations, so it took time to develop certain concepts for them. Everything seemed important. For example, we spent considerable time on the definitions. I explained to the team members that these definitions are generally ignored until a dispute arises, but

that slightly different interpretations of the contract language, absent a good set of definitions, might give rise to claims amounting to tens or hundreds of millions of dollars

Other seminar topics included contract area relinquishment procedures, minimum exploration obligations and claims associated with early termination of exploration activities, the management and conduct of petroleum operations, work programs and budgets, costs and expenditures, rights and obligations of the Contractor, the Government Agent and the actual Operator, and, of course, the all-important concepts and issues involved in developing a reasonable formula that would define the actual sharing of oil and gas production

The team members were surprised to learn that the discovery of gas is oftentimes a mixed blessing for an investor since it involves the need to build a brand new and expensive gas infrastructure at or near his discovery, while in Armenia the sequence of events is backwards the gas infrastructure already exists and the marketing of domestically produced gas could therefore be implemented with a minimum delay and expense We spent a great deal of time talking about and going through the mathematical exercise of applying a various oil and gas-sharing formulas Time ran out and concentration spans narrowed after about four hours, at which time we had covered about half the actual contract contents Since the various team members had other obligations to fulfill and meetings to attend, the first seminar was closed with the understanding that production-sharing agreements are so important that at least half of another seminar should be devoted to them

Second Seminar

This was a continuation of the seminar on production-sharing contracts We had planned to get into some oil and gas law and regulatory issues, but the 4 5 hours were used up just dealing in some detail with additional contract issues We agreed to have one more seminar which would be devoted to oil and gas laws and regulatory issues

The primary issues we discussed were production unitization, an entirely new concept to the Armenian PPIU members, contract clauses favoring the hiring of local personnel and the use of local products if otherwise competitive with foreign personnel and products, and the all-important topic of taxation The discussion focused on how to neutralize foreign apprehensions concerning punitive and discriminatory tax increases and the impact of bilateral tax treaties between the Government of Armenia and the Government of the foreign investor Also discussed in this general topic of Governmental claims were surface rentals, income taxes of foreign personnel, and export and import tariffs on natural gas, crude oil, and products brought into the country to facilitate production operations The rights and obligations involved in selling in domestic markets, the training of Armenian personnel, payments and exchange controls, and environmental regulations were also discussed

Considerable time was spent on the need for and implementation of arbitration proceedings Accounting issues and bank guarantees, as well as various other minor provisions formed the remainder of the day's discussion It was a long 4 5 hours well spent

Third Seminar

This was the final seminar on oil and gas issues. The focus was on petroleum laws, where we discussed, first and foremost, the Bechtel team letter to the World Bank and the Romanian Petroleum draft law of March 30, 1993. A Russian-language version of these two documents had been provided to the participants ahead of time.

It was something of an eye-opener for the seminar participants to see our critique of the original Romanian draft law which was by far too long and too detailed, running to 47 single-spaced pages and 183 articles, too much for any legislator to digest. Not surprisingly given its length, the original draft law was too technical and overly restrictive. These weaknesses were pointed out to the Romanian authorities and described for the World Bank in our letter, at considerable benefit to the Armenians who followed in the wake of the Romanians.

The Romanian Draft Petroleum Law is just over 8 pages in length. Following a few critical definitions, the draft law establishes the State's ownership of all minerals and it defines the newly created Mineral Resources Administration (MRA) as the State's designated competent authority in all petroleum matters. That sparked considerable interest, since the Armenian PPIU is something of an embryonic Mineral Resources Administration.

The draft law then goes on to define the MRA's powers which include the exclusive right to issue petroleum licenses, to negotiate petroleum agreements with foreign and domestic producers, and to regulate the industry. Various rights and duties are spelled out in the law and certain transition provisions define the rights of current producers under the proposed law, now and for the long run. This was of lesser interest to the Armenians since there are no current producers in this country.

By mutual consent, a discussion of petroleum regulations covering exploration and production activities was deferred. That is just too much material. It is important, to be sure, but needs to be covered separately if USAID support for the development of a viable petroleum sector is forthcoming.

Summary

Summarizing the three seminars, the participants find themselves in the unenviable position of having a Ministerial mandate to develop the petroleum sector in short order, without any background or experience in the field. They found comfort in the exposure to petroleum issues that the seminar provided them. Since they have an unrealistic deadline to develop an acceptable petroleum law, they asked me on the spot whether I could write one in the next two or three days. Actually, with a good petroleum lawyer at my side, I could, not within two or three days, but within a week anyhow, given the need to engage the PPIU team in the process. The problem is that the law must then pass the National Assembly, and that will not be an easy task.

APPENDIX B

ARMENIAN GOVERNMENT RESTRUCTURING DECREE

**DECREE ISSUED BY THE PRIME MINISTER OF ARMENIA
REGARDING
STRUCTURAL IMPROVEMENTS IN THE GAS SECTOR
OF THE REPUBLIC OF ARMENIA**

For the purpose of achieving structural improvements, regulating relations between transporters, suppliers, distributors and consumers, defining the role of state bodies, and increasing the efficiency of the gas sector of the Republic of Armenia

1 The Ministry of Energy shall

- a) Restructure "Armgasard" State Concern (SC) into one natural gas importing and transmission State Enterprise and one distribution State Enterprise, within one month, and
- b) Convert the Daughter Enterprise on Material Resources Procurement of "Armgasard" SC into State Enterprises on i) Material Resources Procurement for Armgasard, ii) Production of Construction Materials and Construction Installations Works, iii) Yerevan Vehicles /Cars and Trucks, and
- c) Confirm the Charters for the Newly Created State Enterprises before March 15, 1996, and
- d) Create an Authorized Management Enterprise and re-assign all State Enterprises in the gas sector before March 30, 1996, and,
- e) Within two months, develop and confirm all model agreements between natural gas importers, transmission companies, distributors, consumers

2 Confirm that all Daughter Enterprises in the gas sector will be independent taxpayers, starting from July 1, 1996

**More Detailed Information Regarding the Structural Improvements
in the "Armgasard" State Concern**

In accordance with Government Decision No 361 and various Ministry of Energy Decrees, the "Armgasard" Authorized Management Enterprise (AME) shall be created following the implementation of required changes for currently operating enterprises and other legal-organizational enterprises within the structure of "Armgasard" SC

"Armgasard" (AME) shall be engaged in the transmission, storage, reprocessing, distribution and gas sales in the Armenian gas sector and it shall also be responsible for construction, industrial and other state enterprises that participate in production, activities and services technologically related to the processing and production of natural gas

This management structure shall be created for the purpose of organizing the activities of natural gas and related enterprises and for the definition of their rights, functions, and areas of responsibility It

shall also outline the involvement of other organizations, enterprises and companies, define their respective interests, simplify the relations among them, and identify their scope of operations for production and other activities

The restructuring of "Armgasard" and its current enterprises into different types of legal-organizational enterprises shall be done in compliance with Armenian laws currently in force and with the draft restructuring plan that was developed by the Ministry of Energy (copy of draft restructuring plan is attached)

The relations between the Ministry of Energy and "Armgasard" AME shall be defined by the authorized management contract

The structural reorganization shall establish

- 1) "Armtransgas", a State Enterprise responsible for the supply, storage, and processing of natural gas and for trunk line operations, and
- 11) "Armgas", a State Enterprise responsible for gas distribution and gas industry operation

As part of the gas sector restructuring activity, the following changes shall be introduced

- The "Megri" Gasification and Gas Supply Daughter Enterprise (DE) shall be merged into the "Kapan" Gas Services DE,
- The Abovian Construction and Construction Materials Manufacturing DE shall be changed into a State Enterprise (SE),
- The "Karın" Resort DE shall become a subdivision of "Armtransgas" SE,
- The "Anı" Kindergarten shall become an subdivision of "Armgas" SE
- The Staff Procurement DE shall be included in the structure of "Armtransgas construction" SE
- The Material Supply DE shall be converted into a State Enterprise
- The enterprises of Armgasprom State Concern that are currently State Enterprises shall retain SE status

Several enterprises shall remain within the Armgasard structure, including the "Kazmgas" Lease Enterprise, the "Gas Meter" Joint Enterprise, and "Uran" Ltd

The structural reforms to be provided are intended to foster the development of new management systems typical for market-based economies. Among other things, they are to provide direct and functional intermediate-level management in the gas industry

The principal activity of the Armgasprom "Authorized Management Enterprise" shall be the importation, transmission, and distribution of natural gas. These functions shall be performed by two State Enterprises, "Armtransgas" and "Armgas". These two enterprises shall be responsible for the technical maintenance and operational safety of the trunk lines and the distribution network, respectively. Other enterprises operating within the structure will support and enhance the performance of the State Enterprises that will be responsible for carrying out the main activity of the Armgasprom Authorized Management Enterprise

Unlike the current structure of Armgasprom State Concern, the suggested structure for the gas transmission and distribution enterprises, from an organizational-legal point of view, envisions "Armtransgas" and "Armgas" Enterprises as separate State Enterprises

The legal and functional separation of these two enterprises corresponds to the requirements (Rules of Natural Gas Usage) as stipulated in the Government of Armenia Decree No 44 dated October 2, 1995

The functions of natural gas transmission, storage and the delivery to distribution companies shall be carried out by "Armtransgas" State Enterprise. Hence, "Armtransgas" State Enterprise shall be responsible for the operation, repair and maintenance of trunk lines and branch lines, high pressure regulation stations, underground storage of gas, and compressor stations within the system, as well as the operation and maintenance of electro-chemical corrosion protection equipment of pipelines associated with natural and liquefied gas vehicle re-fueling stations

Relations between "Armtransgas" SE and "Armgas" SE shall be established on the basis of contracts. All sales of gas to distribution companies shall be carried out in accordance with contractual stipulations

Regarding the reforms in "Armgasprom" SC, it is deemed reasonable that the gasification and gas distribution enterprises be preserved. However, the status of these enterprises shall be changed to that of urban or regional distribution daughter enterprises and they shall be included within the structure of the Distribution State Enterprise

"Armgas" SE shall receive natural gas from the transmission company and deliver it to consumers through its distribution network. The company shall also be responsible for the maintenance and safety of the distribution network

The proposed structural change means that the establishment of "Armgas" SE will improve that company's ability to manage the gas distribution system on a unified system-wide basis, to develop and implement a fully integrated technical economic policy, to efficiently use its production, material and financial resources, and to reduce the risk of accidents and mishaps. This change will result in both quantitative and qualitative improvements. The proposed change will give rise to the development of relevant regulations that will assure the efficient operation of the gas industry and the recruitment and deployment of competent staff

It is true that some distribution enterprises and regional daughter enterprises currently within the structure of "Armgas" SE are operating inefficiently, but technical maintenance of the system should be done irrespective of the gas volume imported into the Republic and of the relative loads of the different distribution networks (that is their specific volume throughputs). If a given network system is subject to outages or if gas deliveries are terminated altogether, the pipeline network and related gas facilities must be maintained and kept in good working condition. Otherwise, the assets created over decades will deteriorate and become useless

At present, the amount of gas delivered to the residential and industrial sectors is insufficient or unprofitable in some regions for technical or economic reasons. Different regions are subject to different sales volumes and, as a consequence, to different profit and loss situations. Some regional enterprises, through no fault of their own, have no chance at all to sell any gas. For example, 80% of the gas imported into Armenia is sold by the Yerevan and Hrazdan daughter enterprises. These two enterprises operate at reasonable profit levels, doing essentially the same work as the other distribution companies except that the others more often than not have no gas to sell.

Taking into account the foregoing, the main activity of gas distribution daughter enterprises shall be deemed like those of state owned enterprises which maintain operations and, therefore, retain their status and working capacity in the gas industry. Accordingly, based on contracts to be concluded between the gas distribution State Enterprise and the daughter enterprises within its structure, the daughter enterprises shall receive payment in sufficient quantities to maintain operations and to keep delivery systems in good working order, irrespective of the volumes of their gas sales.

A fully integrated pricing policy for gas sales shall cover the operating and maintenance costs of all daughter enterprises. Such an integrated policy requires that all revenues generated from gas sales in the Republic be centralized in a gas distribution State Enterprise. That is the intended function of the Armgas Company as proposed here.

On the basis of its contracts with regional daughter enterprises, this State Enterprise shall cover the costs for services performed by all gas facilities and shall, therefore, make them profitable. As a result, the daughter enterprises will become independent taxpayer enterprises and they will pay taxes as established by the state.

The preceding mechanism will not be feasible if the mentioned daughter enterprises are converted or restructured into separate State Enterprises or if their management is not centralized in one enterprise.

The financial relations between the gas distribution State Enterprise and the daughter enterprises within its structure are listed in the attachment. (Note Attachment missing)

Remarks

The **Ministry of Justice** had one editorial remark which has been accepted.

The **Ministry of Economy** had no remarks.

The **Ministry of Finance** had 5 remarks, which were accepted owing to the following reasons:

1. The suggested structure of the Armenian gas sector differs from the existing structure in that gas importing, transmission and distribution enterprises are to be separated. Separate State Enterprises on gas imports, transmission and distribution will be established, as mandated by the Government of Armenia Decision No. 44 dated October 2, 1995.

2. The gas system has its specific characteristics. Since the status of State Enterprise has been conferred on all enterprises dealing with electric power distribution, it follows, in the opinion of the

Ministry of Energy, that in the gas system the creation of one distribution State Enterprise will improve the performance of the gas sector. This Distribution State Enterprise will include in its structure all operating gas distribution companies and it will have the status of a legal person and independent taxpayer.

This concept arises from the need for uninterrupted and safe gas delivery. In addition, such a structure will maintain the gas sector of the Republic in a technically viable condition and it will promote the profitable operation of daughter enterprises.

3 The Ministry of Energy of the RA holds that the authorized management enterprise will not be an inefficient unit, and that all gas distribution enterprises should be placed into one central management structure which will be designed to reflect the characteristics of the Armenian gas sector (exclusive reliance on gas imports from foreign countries, issues connected with international transit shipments of gas, import realization, transmission, and distribution).

The authorized management system will facilitate the implementation of a fully integrated technical and economic policy and its scientific and technical implementation, as well as the central accumulation of funds which will enable the gas industry to conduct its operations in a safe manner.

4 The Armturtrade State Enterprise shall remain an autonomous State Enterprise. It shall be involved in regulating financial matters, including the settlement of receivables and payables with other State Enterprises that are operating with it on a contractual basis, and with the "Armgasard" State Enterprise which is the only importer of gas into Armenia, and it shall fulfill its gas procurement function. If necessary, sales shall be procured and imported by barter.

5 The Moscow Office was established many years ago. Its current operating status is that of a division.