

Agency: **United States Agency for International Development**

Contractor: Harza Engineering Company

Contract No.: LAG-I-00-98-00002-00

Task Order No.: 803

Mission Office: Romania

Date of Report: September 2001

Title: ***Prefeasibility Study for Slobozia Municipal Energy Efficiency Investment Project***

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Project Title: Energy Efficiency Projects Selection Technical Assistance, Romania

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Pre-Feasibility Study for Slobozia Municipal Energy Efficiency Investment Project

PREPARED FOR

Harza Engineering and USAID Romania

Contract No. LAG-I-00-98-00002-00

Energy Efficiency Projects Selection Technical Assistance

PREPARED BY



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September 2001

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1 Executive Summary

1.1 Background

Under the USAID/Bucharest Energy Efficiency Projects Selection - Technical Assistance program, Electrotek Concepts, Inc. is supporting the Romanian energy sector with a focus on the improvement of public energy services (heating and lighting), and rehabilitating and modernizing of related municipal infrastructure. In October/November 2000, the Electrotek team met with municipal governments and management of public service utilities (PSU) in 17 Romanian cities to identify projects which would 1) generate sufficient cash flow to return investment in commercial terms, and 2) be secured and affordable within the annual budgets of the municipalities and the PCU.

The city of Slobozia was chosen as one of three sites for project implementation. The first goal is to improve the overall operational efficiency and the heat supply capacity of the Slobozia district heating system so that acceptable heat comfort levels and sufficient domestic hot water supply are realized and affordable to all consumers. The second goal is to improve reliability of the municipal heat supply and to decrease the economic uncertainty caused by the necessity to buy considerable amount of heat from an industrial enterprise Amonil. Technical measures include rehabilitation of three district heating networks.

The pre-feasibility analysis has showed that the proposed project, with the base costs of US\$ 1,041 thousand, has feasible economics for the district heating projects including a payback period of 3.8 years. The project is robust and very appropriate for commercial financing. Project benefits are significant and will lead to more cost-effective heat supply, greater comfort in residential buildings, a more modern municipal infrastructure and the opportunity to fund expansion of social programs without an increase in the municipal budget.

1.2 Project Sponsors

The nature of the proposed project requires direct and close cooperation in its implementation by the Slobozia municipality and the municipal public service utility S.C. Urban S.A. The project should have dual sponsorship, since the new equipment will be operated by Urban while most of its operational and capital costs will be covered, directly or indirectly, by heat subsidies coming from the municipal budget. The decision on which entity will have the lead responsibility should take into account Slobozia political, operational and social realities. The preliminary analysis by the Electrotek team suggests that the Municipality may be a stronger candidate for the role of the leading sponsor.

Municipality

The city of Slobozia (population 55,300 in 2000) is located in Ialomita County about 100 kilometers from Bucharest. The municipal boundary encompasses 13,287 hectares, with the residential area of 1,168 hectares (about 4.5 square miles). In addition to the traditional regional occupations of farming and food processing, the city's economy is also based on the significant presence of industrial enterprises, mainly in production of chemicals, synthetic fibers and construction materials, as well as newer service-oriented businesses. There are encouraging signs of economic stabilization in the city, although the full picture remains somewhat ambiguous. In general, the precipitous decline in production and economic development, which was obvious for the last decade not only in this region but in Romania in general, in Slobozia seems to be coming to an end, if is not yet fully reversed.

Municipal Revenue. The Slobozia budget is formed from two main sources of revenues: local revenues (fiscal and non-fiscal) and transfers from the national budget. Generally, there also could be transfers from the county budget, but they are not regular and depend on the needs of the municipality and the financial conditions of the county budget. In the case of Slobozia, there were no such transfers within the last three years.

Local municipal revenues consist mainly of corporate and individual taxes, which within the last three years substantially changed in structure but continue to be important and amounted to 34.93% of total budget in 1998, 50.28% in 1999 and 43.32% in 2000. Fiscal revenues from individuals contain a number of different items: property taxes, fees for using state-owned land, fees for licenses and authorizations, judicial fees and other stamp duties. Also, all sources of personal income, with the exception of salary, currently are taxed and collected locally. Since companies and other legal entities generally do not pay income taxes to the municipal budget, the bulk of corporate tax revenues comes from corporate property taxes, namely taxes on land and taxes on buildings (11.16%, 9.71% and 14.11% of total revenues in 1998 through 2000 respectively).

Transfers from the national budget are a major part of municipal revenues: 63.21% in 1998, 49.72% in 1999 and 53.36% in 2000. The main part is the municipal share of the so-called “wage tax” - individual income tax of salaried employees withheld from paychecks and transferred to the local offices of Financial Administration. These taxes accounted for 25.69% of the budget in 1998, 41.22% in 1999 and 50.04% in 2000. The rest is primarily heat subsidies for population and centralized investment subsidies.

Overall, the revenue part of the Slobozia budget seems quite stable and secure: total revenues increased from US\$ 2.45 M in 1998 to US\$ 2.97 M in 1999 and then declined to US\$ 2.35 M in 2000, all the time staying around the typical Romanian level of US\$ 45-50 per capita. Meanwhile, the share of subsidies in total revenues decreased from 37.51% to 8.49% and then to 6.64%; the share of local tax revenues steadily increased from 26.12% in 1998 to 30.82% in 2000, and the share of revenues that can be considered dependable (own revenues plus municipal share of individual income tax collected through local Financial Administration) has grown from 60.62% in 1998 to the very high level of 93.36% in 2000.

Municipal Expenses. Slobozia municipal expenses for 1998 – 2000 show that more than 60% of available funds go to public services and development. The rest is shared between administrative and social/cultural expenses. The Slobozia City Council allocates necessary funds to obligatory items (education, heat subsidies for the population, etc.) and practical or social necessities (administrative costs, social assistance, etc.) and then directs the remaining funds to the most urgent current municipal needs. In 2000, expenses for public services and development received US\$ 1.54 M or 64.07% of total expenses, up from 61.84% and 63.75% in the years 1998 and 1999 respectively. A major share of this amount (up to 35.28% of the total budget or US\$ 996 thousand in 1999) is related to operational and capital costs of district heating networks, boiler houses and substations. Generally, this line would include all the operational and capital expenses that relate to district heating.

After having a balanced budget in 1998 and a surplus of 4.89% in 1999, Slobozia ended the year 2000 with 2.11% deficit. Still, its budget should be deemed robust. The share of administrative expenses declined from 11.19% in 1998 to 9.85% in 2000, while the share of social and cultural expenditures has grown from 23.12% in 1998 to 24.8% in 2000 as well as the share of expenses for public services and development (see above). At the same time, the share of financial expenditures dropped from 3.83% in 1998 to zero in 2000 in accordance with the Municipality being able to pay back principal and interest for the short-term operational loans from the treasury it took in 1997 and 1998. Currently the Municipality is debt-free.

Public Service Utility

S.C. Urban S.A., established as a commercial company in 1998, delivers district heating, water supply, sewage collection and wastewater treatment to residents and businesses in Slobozia. Urban also engages in other business activities like installation and repair of water meters or renting out specialized vehicles and commercial space. By far the most important of such activities is the oversight of the construction of apartment buildings for the population funded by the Municipality and managing apartment sales to buyers (actually, issuing mortgage loans); the revenues and expenses from the rest of the auxiliary activities are insignificant as compared to the principal services. District heating and domestic hot water (DHW) is the main Urban business providing 59.4% of total operating revenue in 2000. The majority of Urban heat customers are households (indirectly, through Residential Associations); water supply and sewage services also are delivered directly to a number of individual homeowners.

Urban is 100%-owned by the Slobozia City Council and governed by the general assembly of shareholders who are the members of the City Council. In 1998, when Urban was transformed from Regia Autonome into a commercial company, public assets of the municipal infrastructure were given to it by the Slobozia City Council under a concession. The concession agreement is for 10 years with a possible five-year extension. Under this agreement, for the rights to use conceded assets Urban pays to the Municipality royalties equivalent to the amortization of the assets. City Council has an obligation to fund the major repairs or the upgrade of the conceded assets and the installation of new capacities necessary for providing adequate services, while Urban is responsible for current repairs and maintenance of conceded equipment. Therefore, the concession agreement puts the burden for upgrading municipal infrastructure on the City Council and generally implies that, for social and political reasons, the Municipality has and is willing to financially support the Company.

As a regulated public utility, Urban must have its tariffs approved by an independent public institution – the National Regulatory Authority in the Energy sector (ANRE) in the case of district heating or DHW and the Romanian National Office of Competition for other services. Residents pay for heat only at the level of the National Reference Price that covers just a part of Urban supply cost (the rest comes from the heat subsidies, which are provided by the state or the municipal budget). In fact, the population has difficulty paying even the subsidized price. There are provisions in a standard customer contract for late payment fees and possible disconnection for non-payment. In practice, these articles are not always enforced, which explains persistent difficulties with collection.

Urban does not appear to be as strong candidate for sponsoring the project as the Municipality based on its financial position and performance. Although total operating revenues increased from ROL 40,279 M in 1998 to ROL 66,343 M in 2000, in US Dollar equivalent revenues decreased from US\$ 3.7 M to US\$ 2.6 M. Heat and domestic hot water sales in the US Dollar equivalent for the same period of time also decreased from US\$ 2.0 M to 1.5 M. However, the Company was profitable in the last three years, and in 2000 Urban had the highest profit margin of 1.7%.

1.3 Proposed Project

The purpose of this project is to improve the efficiency and quality of district heating and DHW service by decommissioning three central heating substations (CHSS) and installing local boiler houses (BH) at the main district heating system. The heat, presently supplied via these CHSS is purchased from the private chemical plant Amonil; is to be substituted by distributed generation at new local boiler houses. Currently the cost of heat delivery from Amonil to end-users often exceeds the cost of heat purchase at the Amonil gate. The former is very high due to remote location of Amonil (7 km from the city's border) and extended distribution network. These conditions lead to huge heat losses within the primary (substations) and secondary distribution networks, and also to significant expenses for system maintenance.

This project is an initial part of a broader long-term district heating system rehabilitation program, with the eventual target to have residential heating independent from inadequate and non-reliable Amonil supply. Revenues from energy savings are sufficient to service the debt and finance additional improvements on a time-phased schedule to decommission remaining 8 CHSS and to upgrade their secondary networks. The project would allow an increase in the heat supply to end-user to the amounts necessary for providing indoor comfort level and around-the-clock domestic hot water service.

General System Conditions

Supply Side - Main DH system from Amonil. Amonil has two sources for supplying heat to the Municipality:

The first is dedicated old gas-fired boilers, with the total installed capacity of 25 Gcal/h.

The second source is heat recovery in process cooling (Kellogg process).

Urban pays to Amonil for supplied heat according to the reading of the heat meter installed at heating main nearby to the plant. According to provided data Amonil has about 30 Gcal/h of installed capacity available for heat supply to the city, and this estimate doesn't include the number of boilers designated for steam and heat generation for the own process needs. The main problem for municipal heating is that the plant under no circumstance can supply more than 20 Gcal/h when heat supply is the most needed, i.e. under the coldest outdoors temperatures. Significant portion of the mentioned 30 Gcal/h comes from heat recovery installation in process cooling, but process cooling is not used in winter.

Transmission and Distribution Networks. The primary transmission line between Amonil and southeastern city border is about 7 km long and made by 2 pipes of 700 mm in diameter each. This transmission line belongs to the Municipality and is operated by Urban. This pipe is laid mostly aboveground, well maintained, and recently re-insulated. The lengths of additional primary transmission networks of lesser diameters between the entry into the city border and specific CHSS vary depending on their locations. The longest primary network within city borders runs to CHSS # 8 at the very west and is about 2 km long. Maintenance cost of such lengthy primary networks puts a heavy burden on the Municipality and Urban. During the last three years they spent an equivalent of US\$ 300,000 only on the re-insulation of the primary networks. In addition, an equivalent of US\$ 80,000 was spent for pipe replacement and maintenance in the year 2000.

Besides the so-called "commercial" heat meter located at Amonil gate, all CHSS are equipped with operational heat meters. The last are installed at primary networks next to each of 11 CHSS. All CHSS are inefficient in operation due to poor design, worn-out equipment, and sediment accumulation inside tube-and-shell heat exchangers. The temperature of heating medium in secondary network doesn't exceed 50°C, which is too low and prevents achieving proper indoor temperatures for end-users during the winter.

The secondary (distribution) networks from each CHSS consist of three pipelines in underground, non-accessible, concrete channels. Two pipes carry hot water for space heating (supply and return), and one pipe carries hot water for domestic use. Most pipes are 25 years old; all are oversized and not properly maintained. The pipes are heavily corroded and often flooded, resulting in high heat and water losses (up to 50% within a relatively short transmission and distribution distance). With the absence of heat meters at the building level, most of these losses are passed to heat users.

End-Use Conditions. A comparison of temperatures of space heating water in supply and return pipes next to buildings indicates that the radiators extract inadequate heat. A temperature drop between supply and return pipes next to buildings is 6-7°C instead of 20°C as it should be. This small difference in temperature causes over-consumption of power for water pumping while increased temperature of the return water leads to high heat losses within secondary and primary return pipes. Upgrades in generation

and transmission/distribution of heat will not improve consumer conditions without refurbishing internal heat extraction systems of the apartment buildings.

Project Approach

The approach of this project is to develop a strategy for a gradual transition from the current inefficient operation to one that is efficient enough to deliver required heat in an equitable and affordable manner for all consumers. The most crucial issue for the future of heating system in the city of Slobozia is the selection between two main energy efficient alternatives, namely:

1. Improvements of energy efficiency, accompanied with installation of own capacities. The long-term target for this alternative is to eventually stop heat purchase from Amonil. Municipal government and public service utility proposed this alternative, being uncomfortable with heavy dependence on the policy of a private enterprise.
2. Improvement of energy efficiency without installation of new capacities, presuming that in the future Amonil would continue to sell non-expensive heat to the city.

After a careful review of these alternatives the first is recommended for implementation. Taking into account the recent surge in natural gas price, Amonil would inevitably increase their heat tariffs. Besides, with increased energy cost, heat losses within lengthy primary network would be unacceptable.

Three CHS # 8, 7, and 4 with their secondary distribution networks located at the very end of the heating main are selected for initial upgrade because of:

- Residents at this area more then others experienced non-adequate heat supply, being at “the end of heating pipe”;
- Payments for supplied heat in these regions are good;
- Buildings are larger and better prepared for upgrade.

The following are specific energy efficient measures.

Generation side (in each boiler house):

- Each CHSS is to be substituted by 4 – 6 small boiler houses; with one located in the former building of CHSS and others close to served apartment buildings. The total number of small local networks substituting 3 CHSS would be 15;
- Each BH would include 2- 3 efficient gas-fired boilers and chemical water treatment unit;
- All BH would be equipped with up-to-date controls that eliminate the need for permanent presence of an operator.

Distribution network:

- Replacement of the lengthy and oversized 3-pipe secondary networks with two-pipe systems using smaller, pre-insulated pipes for space heating only;
- Removal of the domestic hot water pipes.

Demand side:

- Flushing of each building heat extraction systems (the municipal government suggested that the Company would complete this upgrade under a contract with individual residential associations);
- Installation of individual heating substation (IHSS) in each building. Such IHSS would consist of: a control valve, a plate heat exchanger, and a pump for space heating; plate heat exchanger(s), a secondary loop circulation pump and controls for DHW. As a fund-saving measure single IHSS might be used for serving several small buildings, providing that these small buildings are located close enough.

The accrued savings from the initial upgrade of these three networks should be sufficient to service the loan and in a few years upgrade the entire municipal heating system. With the increase in overall system efficiency, it might be possible to finance an upgrade with decommissioning of remaining 8 CHSS without additional external financing. Of course, additional external financing will accelerate the transition to an energy efficient operation for the entire district heating system.

Project Capital Cost and Savings

The project cost. The proposed design is based on well-known technical solutions. The costs of equipment, pipes, and construction are consistent with similar projects in Romania and other Eastern European countries.

The project savings and payback period. The summary of estimated savings and simple payback period are presented in the Figure 1-1. It shows that the average simple payback period associated with introduction of distributed heat generation instead of the purchase of heat from remote source and delivery of this heat to user is 3.3 years.

Figure 1-1. Project Cost, Savings and Payback Period

		Total	Network 8	Network 7	Network 4
Heat produced by Amonil and distributed by Urban					
Energy	(Gcal/yr)	23958.0	8649.89	9517.92	5790.19
Cost	('000 US\$/yr) \$	625.098	\$ 225.688	\$ 248.336	\$ 151.074
Heat generated by new installed boilers					
Natural gas					
Energy	'000 m ³ /yr	-2180.460	-812.231	-900.066	-468.163
Cost	('000 US\$/yr) \$	(185.339)	\$ (69.040)	\$ (76.506)	\$ (39.794)
Electricity					
Energy	(MWh/yr)	-197.10	-73.42	-81.36	-42.32
Cost	('000 US\$/yr) \$	(11.728)	\$ (4.369)	\$ (4.841)	\$ (2.518)
Other expenses					
Labor	('000 US\$/yr) \$	(64.901)	\$ (24.176)	\$ (26.790)	\$ (13.935)
Maintenance	('000 US\$/yr) \$	(41.543)	\$ (15.475)	\$ (17.148)	\$ (8.920)
Water	('000 US\$/yr) \$	(1.194)	\$ (0.44)	\$ (0.493)	\$ (0.256)
Others	('000 US\$/yr) \$	(7.998)	\$ (2.98)	\$ (3.302)	\$ (1.717)
Total other expenses	('000 US\$/yr) \$	(115.636)	\$ (43.075)	\$ (47.733)	\$ (24.828)
Total heat generation cost	('000 US\$/yr) \$	(312.703)	\$ (116.483)	\$ (129.080)	\$ (67.140)
Savings	('000 US\$/yr) \$	312.394	\$ 109.204	\$ 119.256	\$ 83.934
Investments	('000 US\$)	\$ 1,041.259	\$ 394.499	\$ 311.706	\$ 335.054
Simple payback period	(Years)	3.3	3.6	2.6	4.0
Estimated present expenses					
Estimated present expenses	(US\$/Gcal)	26.09			
Natural gas price	(US\$/'000 m3)	85.0			
Electricity price	(US\$/MWh)	59.50			
Raw water price	(US\$/'000 m3)	58.23			

1.4 Financial Plan

Type and Amount of Financing Required

Under the base case, the total project cost is US\$ 1,051 K without value added taxes (VAT). Expected total financial resources include debt financing in the amount of US\$ 729 K from lending institutions and US\$ 322 K from the project sponsor(s), including US\$ 9.7 K for interest payments during the construction period. The estimated debt-to-equity ratio is 69:31 (Figure 1-2).

Figure 1-2. Project Cost and Proposed Financial Scheme

Project Cost			
Base project cost	\$	1,041,259	
Capitalized interest during construction	\$	-	
Interest exceeding savings during construction	\$	9,665	
Principal paid during construction	\$	-	
Additional working capital during construction	\$	-	
Total Project Cost	\$	1,050,924	
Base Capital Structure			
Debt	\$	728,881	70.0%
Equity	\$	312,378	30.0%
Total Investments	\$	1,041,259	100.0%
Financial Scheme			
Total loan requested	\$	728,881	69.4%
Project sponsor's contribution			
Investments	\$	312,378	
Interest during construction	\$	9,665	
Total project sponsor's contribution	\$	322,043	30.6%
Other contributions	\$	-	0.0%
Total Investments	\$	1,050,924	100.0%

Financing Sources and Risk Sharing

Obstacles for structuring long-term project financing under the current economic, financial institutional and legal environment in Romania are the following:

- It is difficult to secure commercial bank loans with 3- to 5-year maturity without external credit risk mitigation and loan security.
- The project is too small for large multi-lateral bank interest.
- The IFC, which focuses mainly on private sector project financing, is not very interested in the improvement of municipally owned facilities.
- Financial schemes with foreign vendor's credits or Eximbank participation are conceivable and definitely should be considered. Nevertheless, they might require 100%-banking guarantee and/or some minimal level of municipal rating confirmed by international rating agencies.

Initial discussions with a number of commercial banks indicate that:

- Some Romanian and international commercial banks are interested in long-term project financing under the condition of credit risk sharing.
- Detailed project financial and risk analysis and disclosure of the financial indicators of the project sponsors increase probability of the deal success.
- External mitigation of the credit risk should significantly facilitate financial deal structuring by municipalities and municipally owned companies.

In addition, there are some initial promising results of the Municipality and the Company discussions with potential equipment vendors about the opportunities for the vendor's credit. Considering all of the above, the following financial schemes with five-year maturity are possible:

Scheme 1. Favorable Development

Sources of debt financing

- Principal Financing – US\$ 510 K (70% of the total debt) from commercial lenders with DCA Guarantees covering up to 50% of the funding or up to US\$ 225 K
- Co-financing – US\$ 219 K (30% of the debt) from the vendor

Risk sharing

- U.S. Government – 35%
- Commercial lenders – 35%
- Equipment vendor – 30%

Maturity

- Five years.

Scheme 2. Intermediate Development

Sources of debt financing

- Principal Financing – US\$ 729 K (100% of the total debt) from commercial lenders with DCA Guarantees covering up to 50% of the funding or up to US\$ 364.5 K.

Risk sharing

- U.S. Government - 50%
- Commercial lenders – 50%

Maturity

- Five years.

Scheme 3. Pragmatic Development

Sources of debt financing

- Principal Financing – US\$ 729 K (100% of the total debt) from commercial lenders.

Risk sharing

- Commercial lenders – 100%

Maturity

- Five years.

1.5 Project Cash Flow Analysis

The base case assumes that the debt financing will be in US dollars with a fixed interest rate. The applied current interest on outstanding loan principal is 12%, which currently is 8% above the typical six-month LIBOR. The interest rate is paid monthly without a grace period, and the loan principal is paid in equal parts starting the month following the end of the construction. The five-year loan term includes the one year and six months of the construction period (Figure 1-3).

Figure 1-3. Project Evaluation Period and Loan Conditions

Evaluation Period		
Current year		2001
Construction begins	(da/mo/year)	1-Apr-02
Construction ends	(da/mo/year)	30-Sep-03
Operation begins	(da/mo/year)	1-Oct-02
Operation ends	(da/mo/year)	30-Oct-17
Loan conditions		
Total disbursement	(US\$)	728,881
Disbursement begins	(da/mo/year)	1-Apr-02
Interest payment begins	(da/mo/year)	30-Apr-02
Payment on principal		
Begins	(da/mo/year)	1-Dec-03
Maturity	(da/mo/year)	31-Mar-07
Number of payments		42
Payment amount	(US\$)	17,354
Interest Rate	(Months)	12.00%

The cash flow analysis indicates the payback period for the whole project is 3.8 years, and the IRR for the total capital investment is 33% (Figure 1-4). Assuming a fixed discount rate of 15%, the NPV is US\$ 794 K M or 75% of the total project cost. All subprojects included in the investment package also demonstrated very promising capital budgeting indicators. The lowest IRR is 27%, and the longest payback period is 3.84 years (for the upgrade of the network # 4).

Therefore, the project has a promising financial viability and should be recommended for the implementation.

Figure 1-4. Project Cost, Savings and Capital Budgeting Indicators

	Investments (US\$)	Savings					IRR (%)	NPV (US\$)	Payback Period (Years)
		2002 (US\$)	2003 (US\$)	2004 (US\$)	2005 (US\$)	2006 (US\$)			
Network 8	\$ 394,499	\$ 43,682	\$ 109,204	\$ 109,204	\$ 109,204	\$ 109,204	30%	\$ 283,045	3.46
Network 7	\$ 311,706	\$ -	\$ 47,702	\$ 119,256	\$ 119,256	\$ 119,256	45%	\$ 358,935	2.47
Network 4	\$ 335,054	\$ -	\$ 33,574	\$ 83,934	\$ 83,934	\$ 83,934	27%	\$ 152,041	3.84
Total	\$ 1,041,259	\$ 43,682	\$ 190,480	\$ 312,394	\$ 312,394	\$ 312,394	33%	\$ 794,020	3.83

1.6 Project Risks

Sponsors' Risk. The project sponsors' risk includes risks related to the financial performance of both the Municipality and Urban. Although the comprehensive analysis of such risks is beyond the scope of this work, the pre-feasibility study includes the disclosure of the Municipality and Urban financial statements for the last three years, which demonstrate reasonable assets to secure the debt financing.

There are a number of risks associated with the municipal budget, but most of them are not too significant. One may assume that the risks of adverse changes to the corporate and personal property taxes should be relatively low, and risks related to the timely transfers of heat subsidies are moderate. There is some uncertainty with the risks related to the municipal share of the individual income tax primarily due to inconsistent forecasts of unemployment level in the region and in to some extent due to introduction of the Global Income Tax system. However, positive signs of the stabilization of the economic activities in the city make these risks less alarming. The main conclusion is that with the beginning of project implementation and savings in energy subsidies, the city budget will have a significant amount of funds freed up, not only enough to back up debt guarantee but to ensure the debt service (if the council decides to take the loan).

The most important risks from Urban are related to the issue of customer retention. Future availability of efficiently generated heat provides an opportunity to stabilize sales and show a sustainable financial position at the end of the construction period, if Urban achieves the following goals:

- Increase of the quality of services provided to customers;
- Reduction of the operating costs;
- Improvement in financial and managerial accounting and financial planning.

Finally, two additional important considerations, which substantially ameliorate the sponsors' risk, should be noted. First, the proposed financial schemes provide the security of the loan through the recourse on the project cash flow by establishment of an escrow account for payments of the most reliable Urban customers. Second, the detailed project cash flow analysis on a monthly basis before maturity demonstrates the strong financial viability of the project. Information presented below confirms the robustness of the project under different circumstances relating to the project implementation and the contention that the project sponsor's risk is manageable.

Risk of Heat Tariff Policy Changes. This energy efficiency project is not economically viable if state authorities cannot guarantee the current level or structure of tariffs throughout the period of the loan. Therefore, if the project proceeds, it means that there is some specific understanding or agreement with national regulatory authorities, which will make the risk of tariff policy changes moot.

Completion Risk. The completion risk includes the following risks:

- *Cost-overflow risk* is not crucial, since the proposed technologies and costs are well known worldwide. However, to test an impact of technical and price contingencies on the project financial indicators, a sensitivity analysis was performed. The analyzed scenario accounted for technical contingency in the amount of 3% to cover the cost of additional equipment or other costs that resulting from a more specific design at the actual project site. It also included price contingency of 8% that covers cost changes of the well-known equipment that would result from fluctuations on the Romanian market. The results of analysis show that the technical and price contingencies do not considerably deteriorate promising capital budgeting indicators of the project: the IRR exceeds 30%, the NPV is US\$ 718 K, and the payback period is 4.1 years.
- *Start up delay risk* is minimized by the use of well-known technologies and the proposed month-by-month schedule for the equipment installation over two years. The risk is also reduced by the turnkey contract with adequate incentives for on-time completion. Cash flow analysis indicates that three-

month construction delays for all three networks do not considerably worsen capital budgeting indicators. The IRR is 29 %, the NPV is USD\$ 680 K, and the payback period is 4.2 years.

- *Approval and regulatory risk* is minimal. Most approval and permits have to be provided by the local authorities that are also interested in the fast project development.

Operating Risk. Although Urban has considerable experience in operating the district heating system and is interested in the proper operation of new equipment, training is very important for this risk to be low. The other concern is related to the timely preparation of internal heating systems within the apartment buildings for heat extraction from upgraded networks (primarily, cleaning and flushing of radiators). This concern should be addressed by obtaining preliminary agreements with the residential associations and incorporating the preparation into the project implementation schedule.

The operating risk analysis based on the assumption of decrease in savings by 20% proves the project robustness. Results of this analysis indicate the IRR is 25%, the NPV is US\$ 444 K, and the payback period is 4.7 years.

Worst Case Scenario. Analysis of a “worst case” project scenario assumes one-month construction delay for all three networks, a 6% cost overrun, and a 10% savings decrease over the project evaluation period. However, the results indicate that the project financial viability even under these circumstances: the IRR is 27%, the NPV is US\$ 568 K and the payback period is 4.3 years.

1.7 Project Benefits

Transformation of three central heating substations at main Amonil heating system with their secondary networks into 15 local systems served by 15 local boiler houses provides various benefits for the city’s economy and population. In addition to the main goal of improving reliability, operating efficiency and quality of service for these three upgraded districts, supplementary benefits will include:

- Improvement of service quality for users connected to remaining eight CHSS and still receiving heat from Amonil. Removing of three CHSS from the main network means that more heat would be available for the other eight;
- Reduced long-term cost of heat supply;
- Significant environmental improvements, mainly reductions in emissions of SO₂, NO_x and greenhouse gases from the boiler stacks;
- Technology transfer;
- Management capacity building.

The most significant benefit is the revenue that will be generated by the project after the loan repayment. Project monetary savings are large due to the extensive operating efficiency improvements. This revenue can be used by the municipality and Urban to fund re-investment into upgrade of next substation(s) with secondary network(s). This alternative eventually leads to upgrade of all 11 CHSS with local networks with a relatively small investment, i.e., savings from the initial three systems upgrades can fund the phased upgrade of the remaining eight systems.

1.8 Conclusions and Next Steps

Conclusions

Even in today’s difficult economic conditions for municipalities and municipal public service utilities, the project financial indicators are favorable under most circumstances and appropriate for the commercial financing of a district heating rehabilitation project. There are many reasons why the Municipality and Urban should go ahead with project implementation. Project benefits are significant and will lead to more

cost-effective heat supply in the future, greater comfort in residential buildings, and more modern heat supply infrastructure.

Recommended Next Steps

Step 1: Approve Project and Select Financial Schemes

Specific technical measures and the project sponsor are identified. Urban negotiates the tariff level for return of investments with ANRE. The project sponsors agree on a financing scheme.

Step 2: Market Project to Lenders

The project sponsors identify a lender and negotiate terms and conditions of financing including the loan security package. The project sponsors clarify the requirements for loan documents.

Step 3: Prepare Security Package for Project Financing

The Municipality provides guarantees of the loan repayment and should consider increased municipal contributions to make loan approval easier.

Step 4: Develop Detailed Business Plan and Other Loan Documentation

The project sponsors finalize the project technical design, develop an implementation schedule, and prepare loan documents including a detailed business plan.

Step 5: Establish Project Management Team and Responsibilities for Implementation

A Project Management Committee is formed. Dedicated technical and financial staff is identified. Specific tasks required to implement the project are identified and delegated to the designated staff.

Step 6: Specify, Procure and Install Equipment

Detailed specifications are developed for specific equipment and modifications. Buildings and facilities are audited, vendors identified, and a tender offered. After award, an implementation schedule is agreed upon. Local or regional vendors are identified to install, commission and test the equipment to insure high-quality results and to provide a warranty for the work.

Step 7: Monitor and Verify Energy Cost Savings

A Monitoring and Verification (M&V) plan is developed to measure energy and cost savings. This plan also identifies monitoring equipment and assigns M&V tasks to specific members of the Project Management Committee. Savings for specific measures are verified on a monthly basis during the first year of the project and less often (every three months) afterwards. Energy savings information and data are forwarded to designated financial staff, so they can calculate energy cost savings due to the project.

Step 8: Provide Debt Service

The energy cost savings is calculated. Depending on the financing approach that is used, the Municipality may choose to set aside this amount in a special escrow account to provide for debt service. Alternatively, the debt service amount may be derived from other financial sources.

Step 9: Ensure Further Rehabilitation of the District Heating System

The municipal government and residential associations reach agreement on flushing and cleaning internal heating networks inside buildings connected to upgraded networks. Secured spaces are allocated inside buildings for individual heat substations. Dedicated public service utility personnel are given continuous access to this equipment.

2 Municipality

2.1 General Information

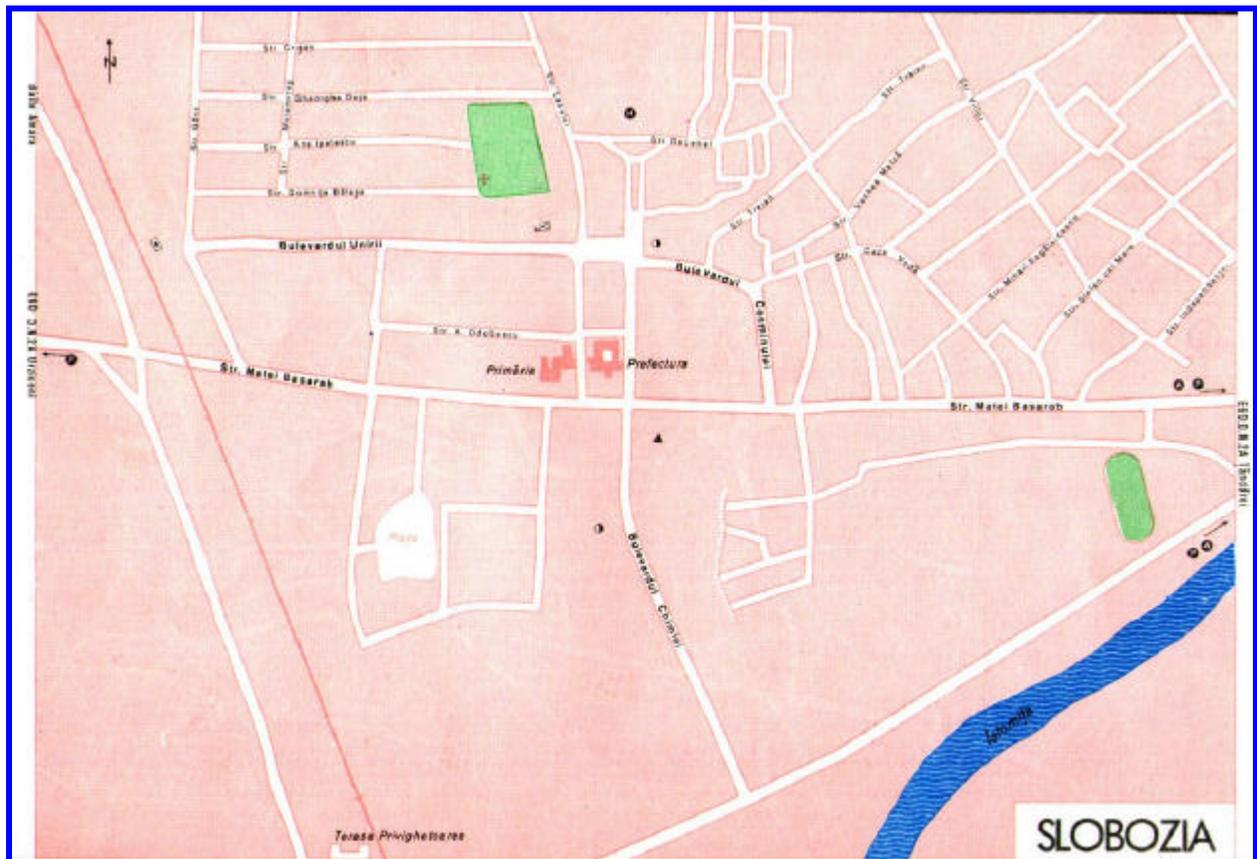
Figure 2-1. Map of Romania and Ialomita County



The municipality of Slobozia is situated in the southeast of Romania, on the plane of Baragan, about 100 km East from Bucharest (Figure 2-1). The city, which is built on the ruins of an ancient Roman settlement and according to some evidence is 400 years old, stands on the left bank of the river Ialomita, at the junction of the East-West national road DN 2A (E 60) Bucharest-Constanta with the roads North-South DN 2C (to Buzau) and DN 21 (to Braila and Calarasi). Slobozia is the seat and the biggest city of the Ialomita county and is home to 55,300 people, about 18% of the total and 44% of the urban population of the county (there are two other municipalities, one town and 130 villages in this county). The climate of the region is temperate continental with the multi-annual average temperature of 11°C (52°F) and the annual average rainfall between 400 mm and 500 mm. The prevailing relief is the plain, crossed by the river Ialomita. Available natural resources consist of rich soil (basically black and brown chernozem), small reserves of oil and natural gas, and abundant raw materials for construction industry - clay that is used in the production of bricks and roof tiles, sand, etc. The area also has certain resort potential: there are a number of spas at lakes Amara and Fundata located northwest from Slobozia and containing sapropelic mud and salted water with bromide and magnesium, excellent for the treatment of rheumatism; there are also underground sulphurous springs at 100 m depth and deposits of thermal water more than 3,000 m deep.

The total area of the Municipality is 13,287 ha, or just above 50 square miles (Figure 2-2), of which 10,436 ha represent agricultural lands, 1,168 ha constitute residential zone, 214 ha are occupied by business developments, and 936 ha used by transportation sector. Slobozia includes two suburban districts - Slobozia Noua and Bora.

Figure 2-2. Map of Slobozia



Following the general Romania demographic trend of the low birth rate and strong aging of population, especially manifest in the south region, the area presents a decline in both general number of inhabitants and labor force (Figure 2-3). Nevertheless, the forecast for 2001 foresees slight increase of population to 55,622. Reported level of unemployment in Slobozia is about national average for Romania. It has slightly risen during the last three years, but the main reduction in a number of employed occurred in 1998, so the increase of the unemployment rate in 2000 was primarily caused by the decline of total population (from 56,092 to 55,308) rather than by increase of the number of unemployed.

Figure 2-3. Slobozia Population and Employment Indicators

	1998	1999	2000
Population	56,442	56,092	55,308
Of which employed	19,829	17,987	17,900
Unemployment rate	10%	13,7%	13,8%

Historically, due to fertile land and mild climate, economics of the region was based on farming and food processing. Crop, livestock and dairy production still constitutes main business activity in the Ialomita county, especially cultivation of sugar beets, pork and poultry breeding, cooking oil and wine production (countywide, 58.5% of the population is rural, so more than 50% of employment is in the agriculture while only 13% is in industry). But in the city of Slobozia, in addition to these traditional occupations, there is significant presence of industrial enterprises, mainly in production of chemicals, synthetic fibers and construction materials (Figure 2-4). Also, the share of newer, service-oriented businesses (such as banking, insurance and financial services, trade fair and exhibition organization, computer engineering, education and training) is expanding. Finally, tourist industry in the county is also growing. The structure of registered employees in private businesses in Slobozia shows that 4,849 people work in industry, 4,365 in retail and trade, 387 in agriculture and 1,209 in construction.

Figure 2-4. Main Areas of the Business Activities for Economic Entities in Slobozia

Activity	Number of Economic Entities
Retail and wholesale trading	2217
Services	151
Agriculture and auxiliary services	86
Construction	71
Transport	67
Food and beverages	52
Textiles and garments	23
Publishing	18
Furniture manufacturing	11
Wood processing	9
Rubber and plastics processing	9
Synthetic and artificial fibers	8
Metal works	8
Pulp and paper	3

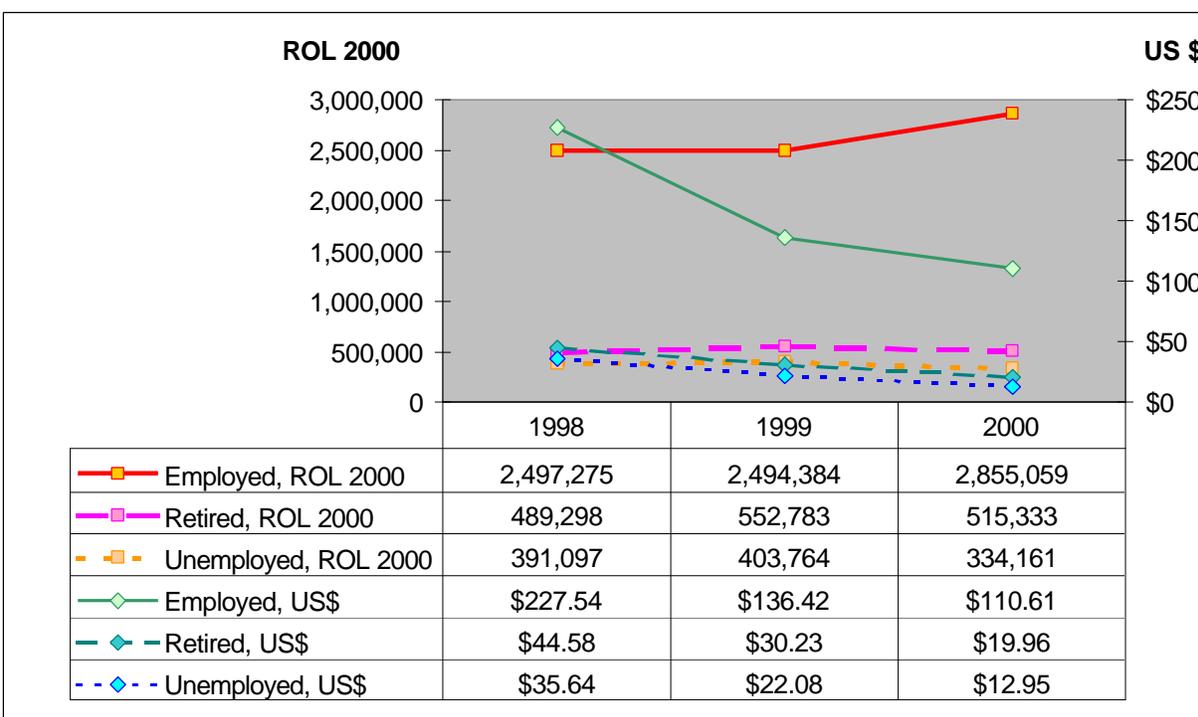
Southeast of Romania, where Slobozia is located, is not the most prosperous region of the country, so although there are encouraging signs of economic stabilization in the city, the full picture is somewhat ambiguous. Data supplied by the City Hall of Slobozia indicates regular increase of average annual

income for Slobozia residents in nominal Lei (Figure 2-5). The analysis shows that the income per capita pretty much has kept in step with the inflation (Figure 2-6), with the average income of employed actually growing, income of retirees staying about the same and income of unemployed declining in 2000. But comparison of income in different years converted in hard currency shows that in US Dollars the average income for an employed person dropped more than in half while for an unemployed it decreased almost three times. Given the agricultural nature of the region and the fact that significant part of a household consumption is comprised of local products, one can conclude that in fact during the last several years there might have been some decrease of real purchasing power of an average Slobozia family, though not as drastic as could be inferred from the analysis of income trends in hard currency equivalent.

Figure 2-5. Average Monthly Income per Capita in Slobozia (in Nominal Romanian Lei)

	1998	1999	2000
Average annual income, ROL, for			
an employed person	1,175,572	1,712,000	2,855,059
a retired person	230,333	379,398	515,333
an unemployed person	184,106	277,120	334,161
Annualized inflation rate	59.1%	45.8%	45.7%

Figure 2-6. Average monthly income per capita in Slobozia (in Inflation-Adjusted Romanian Lei and US Dollars)



Likewise, general indicators of business activity in Slobozia are contradictory. Even though total revenues of private and mixed-ownership companies are increasing (Figure 2-7), they lag behind not only US\$/ROL conversion rate, but even official inflation data. On the other hand, average profit margin for Slobozia companies increased from 3.2% in 1998 to 5.6% in 2000. This and many other things suggest

that the precipitous decline in production and economic development, which was obvious for the last decade not only in this region but in Romania in general, is coming to an end, if is not yet reversed.

Figure 2-7. General Indicators of Private and Mixed Ownership Companies' Business Activity in Slobozia (Thousand ROL)

	1998	1999	2000
Total Revenues, 1000 ROL	3,015,083,592	4,271,942,410	5,423,303,103
Total taxable income, 1000 ROL	98,780,431	129,845,123	305,761,348
Income taxes, 1000 ROL	27,719,524	41,836,072	47,272,817

^{*)} According to the City Hall, there are no 100% state-owned companies in Slobozia.

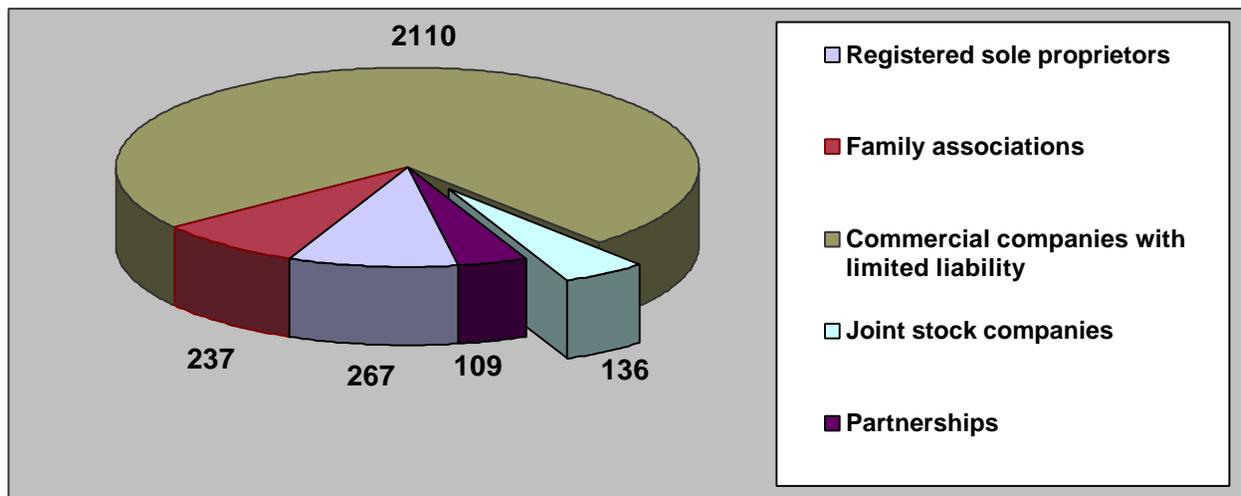
Among major employers of Slobozia is a new and dynamic, aggressively growing private company Korin SA that was established with participation of Korean capital and fully relies on imported technology and equipment (the company plans to expand its production lines to include plastic toy manufacturing). Another major enterprise of the city is Amonil SA – a large chemical facility producing different fertilizers and chemicals, mainly nitrogen-related. This relic from the previous era (it was built under the socialist regime) has known better days; in it's heydays it employed more than 2,500 people. After the revolution of 1989 it was privatized and, struggling to find customers for its production, had to cut down workforce to about 1,000 people. Lately the company was able to find clientele abroad and has been slowly restoring its active capacity. In the year 2000 it claimed revenues of 819,4 billion ROL and the profit margin of 3.9%. These two plus five other companies (Figure 2-8) register constant or growing trend of their activity. There are several more big employers in the city. But, with the exception of about 3,500 people on payroll of budgetary organizations, most of residents are working in small firms, nearly all of which employ just several people.

Figure 2-8. Major Growing or Stable Employers in Slobozia

Company	Business Description	Ownership	Number of Employees		
			1999	2000	2001
KORIN SA	Cotton fibers and garments manufacturing	Private	230	1200	1200
AMONIL SA	Production of fertilizers and chemicals	Private	1100	1100	1100
AVICOLA SA	Chicken and other poultry production	Mixed (majority private)	400	450	450
ULCOM SA	Production of cooking oils and derivatives (sunflower and linseed).	Private	600	150	350
IMP SA	Bakery	Private	250	200	200
CERES SA	Agriculture and livestock	Private	300	200	200
TELETEXT SA	Dairy production	Private	40	50	50

This is typical for small Romanian cities and is in line with the breakdown of Slobozia business entities by legal type (Figure 2-9) that shows significant shares of sole proprietors, partnerships, family associations and commercial companies with limited liability (the last being a legal structure that is adequate for a major business but tends to be used mostly by small firms with few employees). The total number of economic entities registered in Slobozia municipality is 2,870, of which 73.5% are companies with limited liability, while the rest is comprised of family associations, sole proprietorships and partnerships. About 5% are represented by joint stock companies. Three quarters of the small enterprises is service or trading companies. Their great number counterbalances instability of their individual performance, so as a whole this sector of the local economy performs more or less steadily.

Figure 2-9. Types of Economic Entities Registered in Slobozia



2.2 Institutional and Legal Framework

Romania is getting initial experience with decentralized national governance. While Article 119 (Chapter V, Section 2) of the Constitution of Romania states that public administration is "based on the principle of local autonomy and decentralization of public services," local governing bodies still have restricted legal authority and even that formal authority is de facto limited by the central government's control over a major part of financial resources. There have been continuing efforts to amend the laws and fiscal policies to make local administration more effective and sustainable; namely, these were the explicit goals of the Local Public Finance Law # 189 of 14/10/1998 and of the recently adopted new Law # 215 of April 23, 2001. Nevertheless, a number of persistent contradictory regulations and economic practices make the process very slow.

The somewhat contradictory and deficient state of the legal framework and practices is not unique to the issues of local public administration; in general, legislative process in Romania is often inconsistent. According to the Romanian Constitution, the only legislative authority in Romania is the Parliament, and therefore only the Parliament can pass **Laws** (the Government has legislative initiative, i.e. it may only propose specific draft laws or legislative suggestions to the Parliament). On the other hand, in order to insure implementation of the internal and external policies and public administration in general, the Romanian Government can issue **Decisions** and **Ordinances**. Decisions are issued in order to organize the execution of a specific law already passed by the Parliament. Ordinances can be of regular and **emergency** types; both are issued only in periods when the Parliament is not in session and/or for

extremely urgent problems. An ordinance must be approved by the Parliament and transformed into a law as soon as possible. In reality, though, an ordinance may be valid for years before the Parliament takes it under consideration. This practice of ruling the country through ordinances is in fact the most controversial legal aspect of the recent governments Romania has had. There is no formal limitation for the issues addressed by an ordinance or the way it solves a problem and no previous law is necessary. Therefore, there are currently numerous ordinances that are practically laws in scope and in function, although the Parliament hasn't approved them yet.

To further detail the provisions of a law, government decision or ordinance, the specific Ministries may issue **Orders** and **Norms**. Similarly, national bodies (like the recently constituted ANRE) may issue **Decisions, Orders** and **Instructions** or **Norms**. There is no legal limitation for the scope of such low-level legislative acts either. In fact, in Romania often the most important legislative act is a Norm (or Order) because it deals with the day-to-day activity and could turn upside down every provision of the higher-level laws. So the theoretical chain “law - government decision - government ordinance - order of a Ministry” occasionally has missing links or even is pulled from the wrong end.

The country consists of 40 counties that have 262 towns, of which 79 are municipalities, and 2,686 communes composed of more than 13,000 villages (the capital city of Bucharest also has the status of a county). The counties are administered by county councils and their chairmen. Additionally, to each county the central government appoints prefects, who represent its interests at the local level and who oversee county and municipal activities, mainly from the point of view of their compliance with the national legal framework. According to the new Law on Local Public Administration, a county council has many prerogatives, the major of which are:

- elaboration and implementation of goals, strategies, and programs and to facilitate the social and economic development of the county;
- general administration of the public and the private domain of the county;
- ensuring the material and financial conditions for the implementation of cultural, educational, and social programs;
- coordination of the activity of local councils at the county level to provide efficient delivery of public services.

From the point of view of this study, it is important that a county council develops and approves the budget of the county, including allocation of the transfers from the state budget among the county cities and villages, authorizes construction, modernization and maintenance of all the infrastructure of the county, can help cities and villages with infrastructure-related problems and is in charge for environmental protection programs.

The council's President, Vice-Presidents and several other councilors form a so-called “permanent delegation” – they are salaried employees whose full-time occupation is work in the county council. Other members of the county council have separate jobs; they are not engaged in the work of the county council full-time, although they are paid for performing the duties in the council. The permanent delegation develops the agenda of the council meetings, prepares draft decisions or other relevant documents and oversees the implementation of the council's decisions.

The number of members of a county council depends on the county population and ranges from 31 (population up to 350,000) to 37 (population over 650,000). Currently the Ialomita County Council has 37 members (the full list of members see in the Informational Attachment A); according to the new law it should have 31. The Permanent Delegation of the Ialomita County Council consists of the Council's President, two Vice- Presidents and six councilors. Eight parties are represented in the County Council. The Party of Social Democracy of Romania (PDSR) holds the strongest position, with 15 councilors out of 37, who include the President, both Vice-Presidents and three members of the permanent delegation.

Municipalities and communes are governed by mayors and local councils, which are elected for four-year terms in direct local elections (last elections to the local councils, as well as mayoral elections, were held on June 4, 2000). The number of members of each local or county council is also determined by the population of the locality and may vary from 9 to 31. Slobozia City Council has 23 members and consists of five permanent commissions: the Commission for public administration, legal issues, public order and citizens' rights, the Commission for budget, finance, studies, social-economic forecast and local development, the Commission for education, religious issues and child's rights protection, the Commission for health and social assistance, culture, monuments preservation, leisure and sports, and the Commission for urban development, public works, private and public property management and environmental protection. There is no permanent chairman of the local council: the chairmanship rotates monthly among the chairs of the commissions (the list of members see in the Informational Attachment **B**).

There are four political parties represented in the Slobozia council: Party of Social Democracy of Romania (PDSR), Great Romania Party (PRM), National Liberal Party (PNL) and Democratic Party (PD), but no independent candidates. PDSR has a clear majority – 14 seats out of 23, with Slobozia mayor and both vice-mayors being the members of this same party. Three more parties, PRM, PNL and PD, are represented by three members of the local council each.

The rights and responsibilities of the local council and the City Hall are determined by the Law on Local Public Administration # 69 of November 26, 1991 (in particular, by Art. 44 (1), (2)) with later amendments to it, mainly in the Law # 24 of April 12, 1996 and the Art. 38 of the new Law on Local Public Administration that came into force on April 23, 2001. To the most part, they mirror the rights and responsibilities of a county council, only at the local level. Main issues addressed by a local council are approval of the local budget, establishment of local taxes and fees, management of the public and the private domains of the town; decisions on issuing concessions of the public services or renting the public property of the town, and approval of the investments of local interest and providing the means to build, maintain and improve the local infrastructure. Regular meetings of the local council for the discussion of general issues occur monthly and typically have an agenda with several items. Meetings of the commissions happen twice a month. If there is an urgent problem, the mayor can call an extraordinary meeting of the city council.

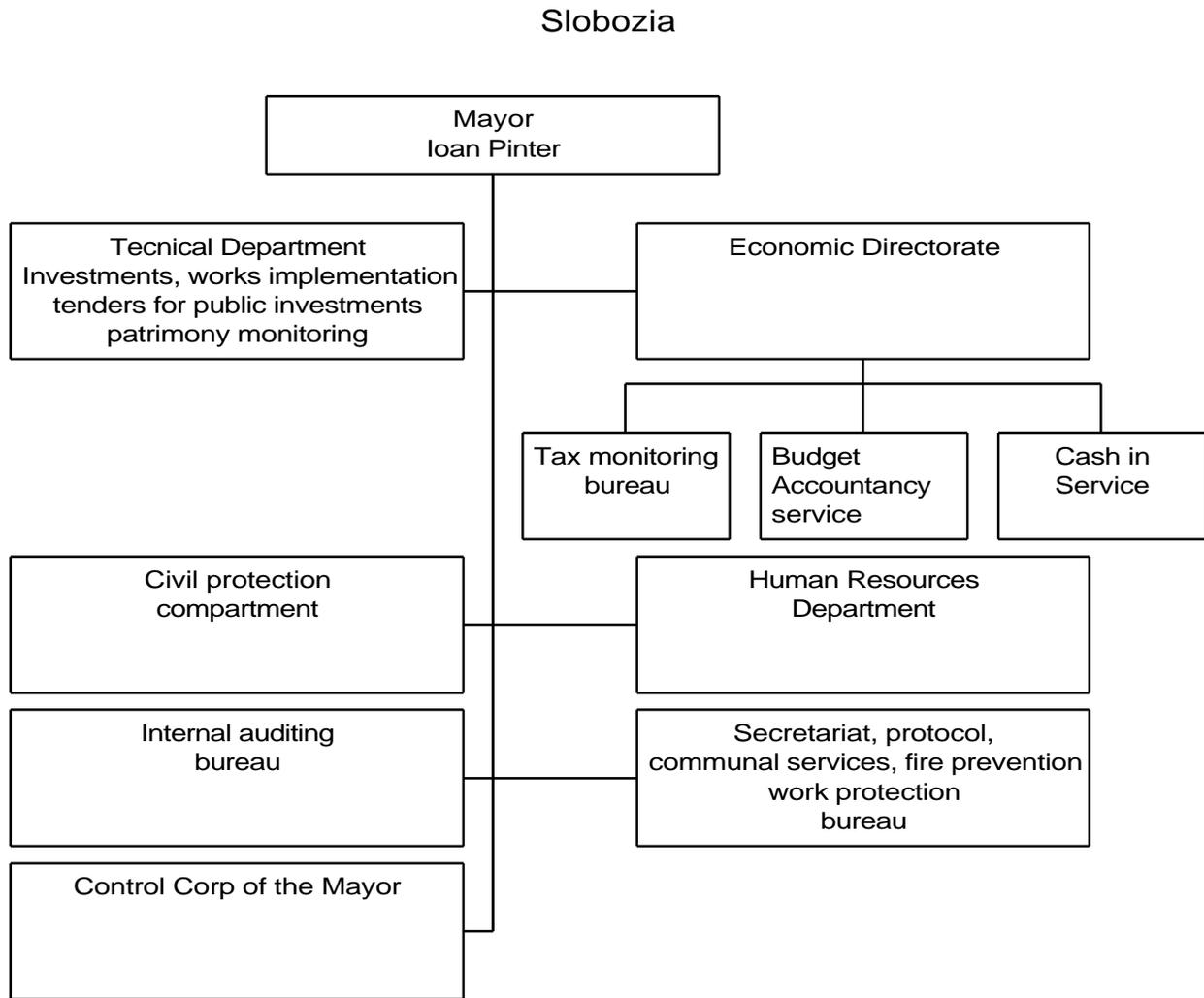
Any member of the council, acting alone or on behalf of a citizen, can put forward a proposal for action or discussion on the local council. A proposal then is directed to the relevant commission or commissions by the legal advisor of the local council, who is appointed by the county prefect and, despite its misnomer title, represents the interests not of the city council but of the national government. After the approval vote by the commission, a proposal gets back to a legal adviser for a review. In case of the positive conclusion, a proposal goes for a vote on the full council meeting. If legal advisor does not approve a proposal, full local council cannot vote on the proposal (it is assumed that putting an item for a vote on the meeting in such case would be illegal). If the council disagrees with the decision of the legal advisor, it can appeal the decision to the county prefect and then to the Administrative Court. For ordinary issues, the quorum requirement is 2/3 of the council, and majority needed for approval of ordinary proposals is half from present votes plus one. If an issue concerns local budget or local taxes, majority requirement changes to half plus one vote out of the full number of counselors. If an issue concerns local development (as the term is defined by the legal advisor) or the internal or external associations (i.e., involves cooperation with other local councils), majority requirement changes to 2/3 votes out of full number of counselors.

There are only two issues that are formally scheduled for voting: local budget and local taxes. All other issues are discussed and voted on ad hoc. Local taxes for the next year have to be approved annually before November 30. Local budget has to be approved after the national and county budgets. The procedure for development and approval of the local budget is long, slow and most of the time late. The first version of a local budget for the current year is supposed to be approved by October 25 but is often

finalized later (a draft should be developed in the City Hall and proposed by the mayor to the local council). After approval in the council, the draft budget goes to the county council. After receiving proposals from all the locales, county council develops county budget that is submitted to the national government. After receiving input from all counties, the central government develops a national budget for the country and get an annual Law on the budget approved in the Parliament (usually, it happens by March –April but can be seriously delayed: in 1997 the budget law was approved on April 26 and in 1999 on March 6, while in 2000 on May 2 and in 1998 only on June 02; the budget law for 2001 was completed in April). This law, which contains the amended budget figures for every county, triggers the second round of adjustments to county budgets. When the amended county budgets are approved, local councils have to reconsider their own budgets in order to accommodate the latest changes. Therefore, the final version of a local budget emerges sometime in the summer, half through the year for which it is developed. Meanwhile, the City Hall has to operate on one twelfth of the last year budget monthly (this amount is transferred from the state budget to the special line of a local budget). This creates considerable uncertainty that further limits decision-making on the local level.

Even though formally the jurisdiction of local councils and City Halls is determined by numerous legal acts, in practice there is no fixed list of obligations for local authorities, and their rights and responsibilities can be influenced by a number of laws and regulations of different origin. First of all, an annual budget law can modify the scope of authorized or disallowed expenditures for a local budget. Then, other laws or ordinances can impose additional burdens – e.g., the Law on Education # 84 of July 24, 1995 as amended by the Law # 98/2001 of March 26, 2001 specifies that local budgets bear all expenses for primary and secondary education with the exception of teachers salaries, and Emergency Ordinance # 162 of October 28, 1999 dictates that local budgets have to pay district heating bills for households with low income. Finally, there are continuous changes in rules and regulations related to taxes and fees, both national and local, so the revenues of the local budget are subject to the same uncertainty as the expenses.

Figure 2-10. Organization Chart of the Slobozia City Hall



The Figure 2-10 presents the organization chart of the Slobozia City Hall.

2.3 Municipal Budget

Revenues

Structure of local budgets is unnecessarily complicated: the income part of the municipal budget in detail disclosure form consists of 94 rows, and expense part of 336 rows. A budget is usually funded by a great number of different sources regulated by even greater number of legal acts, while most of them represent a very small percentage of the total budget revenues. Specifically, municipal budgets are formed from three main sources of revenues: local revenues (fiscal and non-fiscal), transfers from the county budget, and transfers from the national budget. Within these subdivisions, revenue sources also differ by nature (taxes, fees, subsidies or transfers) and purpose (general use funds or special destination revenues, which can be so detail as to include a separate line like “Revenues from renting, selling and giving concession on the goods under the management of public hospitals”). This complexity not only impedes dependable

financial planning and forecasting by the local authorities but also invites collection difficulties and enforcement problems.

Figure 2-11. Main Indicators of the Slobozia City Budget. Revenues

	1998			1999			2000		
	'000 ROL	US \$	%	'000 ROL	US \$	%	'000 ROL	US \$	%
OWN REVENUES									
Tax revenues									
Taxes from population, including	3,028,241	\$ 275,922	11.28%	8,325,914	\$ 455,341	15.34%	7,546,644	\$ 292,358	12.44%
Locally collected individual income taxes	2,565,714	\$ 233,778	9.55%	3,485,078	\$ 190,598	6.42%	765,222	\$ 29,645	1.26%
Individual property taxes	352,284	\$ 32,099	1.31%	4,443,145	\$ 242,994	8.19%	6,653,321	\$ 257,751	10.97%
Other taxes and fees from the population	110,243	\$ 10,045	0.41%	397,691	\$ 21,750	0.73%	128,101	\$ 4,963	0.21%
Tax for state-owned land use	324,038	\$ 29,525	1.21%	288,990	\$ 15,805	0.53%	323,253	\$ 12,523	0.53%
Taxes from legal entities, including	3,072,746	\$ 279,977	11.44%	5,385,907	\$ 294,553	9.92%	8,556,636	\$ 331,486	14.11%
Corporate property taxes	2,998,144	\$ 273,179	11.16%	5,273,103	\$ 288,384	9.71%	8,558,304	\$ 331,550	14.11%
Income tax on autonomous regies subordinated to the local authority	74,602	\$ 6,797	0.28%	112,804	\$ 6,169	0.21%	-	\$ -	-
Agriculture income tax	-	\$ -	-	-	\$ -	-	-1,668	\$ -65	-
Other locally collected taxes and fees	590,537	\$ 53,807	2.20%	1,133,141	\$ 61,971	2.09%	2,269,021	\$ 87,902	3.74%
Total tax revenues	7,015,562	\$ 639,231	26.12%	15,133,952	\$ 827,670	27.88%	18,695,554	\$ 724,269	30.82%
Non-tax current revenues									
Profit from autonomous regies subordinated to the local authority	158,983	\$ 14,486	0.59%	217,192	\$ 11,878	0.40%	87,595	\$ 3,393	0.14%
Revenues from public institutions	623,838	\$ 56,842	2.32%	971,226	\$ 53,116	1.79%	952,194	\$ 36,888	1.57%
Miscellaneous revenues	1,282,788	\$ 116,883	4.78%	3,191,356	\$ 174,534	5.88%	4,760,437	\$ 184,420	7.85%
Total non-tax current revenues	2,065,609	\$ 188,210	7.69%	4,379,774	\$ 239,528	8.07%	5,800,226	\$ 224,702	9.56%
Revenues from equity	299,706	\$ 27,308	1.12%	5,087,675	\$ 278,243	9.37%	793,097	\$ 30,725	1.31%
Revenues with special destination	-	\$ -	-	2,692,986	\$ 147,278	4.96%	986,165	\$ 38,204	1.63%
TOTAL OWN REVENUES	9,380,877	\$ 854,750	34.93%	27,294,387	\$ 1,492,720	50.28%	26,275,042	\$ 1,017,900	43.32%
REVENUES FROM OTHER SOURCES									
Municipal share of individual income tax collected through Financial Administration	6,900,000	\$ 628,702	25.69%	22,376,813	\$ 1,223,780	41.22%	30,354,348	\$ 1,175,933	50.04%
Allocations from the county budget	-	\$ -	-	-	\$ -	-	-	\$ -	-
Subsidies, including									
Heat subsidies from the state budget	-	\$ -	-	-	\$ -	-	2,011,706	\$ 77,934	3.32%
Investment subsidies from the state budget	1,374,514	\$ 125,240	5.12%	4,610,402	\$ 252,141	8.49%	-	\$ -	-
Other subsidies	8,700,000	\$ 792,711	32.40%	-	\$ -	-	-	\$ -	-
Subsidies from other budgets	-	\$ -	-	-	\$ -	-	2,018,372	\$ 78,192	3.33%
Total subsidies	10,074,514	\$ 917,951	37.51%	4,610,402	\$ 252,141	8.49%	4,030,078	\$ 156,126	6.64%
Financial revenues									
Investment loans	-	\$ -	-	-	\$ -	-	-	\$ -	-
Short-term (operating) loans	499,996	\$ 45,558	1.86%	-	\$ -	-	-	\$ -	-
Other financial revenues	-	\$ -	-	-	\$ -	-	-	\$ -	-
Total financial revenues	499,996	\$ 45,558	1.86%	-	\$ -	-	-	\$ -	-
TOTAL REVENUES FROM OTHER SOURCES	17,474,510	\$ 1,592,210	65.07%	26,987,215	\$ 1,475,921	49.72%	34,384,426	\$ 1,332,058	56.68%
TOTAL REVENUES	26,855,387	\$ 2,446,960	100.00%	54,281,602	\$ 2,968,641	100.00%	60,659,468	\$ 2,349,958	100.00%
<i>Exchange Rate ROL/US\$</i>									
	<i>10,975 at December 31</i>			<i>18,285 at December 31</i>			<i>25,813 at December 31</i>		

The taxation system has dramatically changed in Romania since the end of the socialist regime in 1989. The current legal framework is defined by more than a dozen of laws and even greater number of ordinances and decrees enacted since early 90s¹; many of them are contradictory, so the system still is in the state of constant flux. For an outsider, it is very difficult to discern or predict a consistent thrust of the

¹ Main legal acts that define Romanian taxation system are: Law # 12 of January 30, 1991 on excess profits tax; Law # 73 of July 12, 1996 on profits tax as amended by Emergency Ordinance # 83 of December 23, 1997, Government Ordinance # 40 of January 30, 1998, Emergency Ordinance # 47 of April 20, 1999, Emergency Ordinance # 139 of September 14, 2000, and Emergency Ordinance # 246 of November 20, 2000; Law # 32 of March 29, 1991 on wage and salary tax, as modified by Government Ordinance # 62 of August 28, 1997 and Government Ordinance # 6 of January 23, 1998; Government Ordinance # 15 of August 19, 1992 on local taxation and Law # 27 of May 17, 1994 on local taxation, as amended by Government Ordinance # 61 of August 28, 1997, Emergency Ordinance # 84 of December 23, 1997, Emergency Ordinance # 62 of December 28, 1998, Emergency Ordinance # 15 of March 2, 1999, Emergency Ordinance # 27 of March 25, 1999, and Law # 67 of April 27, 2000. Other relevant acts of less significance - like Law # 34 of May 30, 1994 on agricultural income tax and amendments to it; Law # 147 of July 13, 1998 on entertainment tax, or Governmental Ordinance # 82 of December 23, 1997 on excise tax and other indirect taxes and fees - are too numerous to describe here.

reforms. One must assume they are undertaken with the intention of making the whole system more simple and transparent, but the efforts often result in increased, not reduced confusion and uncertainty.

Analysis of the Slobozia budget revenues for the last three years (Figure 2-11 and a more explicit table in Attachment C) shows that relative importance of different sources slightly changed from year to year. Again, it is difficult to deduce from changes a rational trend – it’s more likely that they are the result of the interplay by a variety of random factors.

Among own tax revenues of the Municipality, taxes from population and taxes from legal entities, located and registered in the city, represent roughly comparable shares: the former increased from 11.28% in 1998 to 15.34% in 1999, then dropped again to 12.44%, while the latter in 1999 decreased to 9.92% from 11.44% in 1998, then have grown to 14.11% in 2000.

Figure 2-12. Major Corporate Taxpayers in Slobozia (ROL)

Company	1999				2000			
	Tax on Buildings	Tax on Land	Tax on Motor Vehicles	Fees on Use of Land	Tax on Buildings	Tax on Land	Tax on Motor Vehicles	Fees on Use of Land
URBAN SA	10,073,312		10,200,000	64,967,560	16,189,560		15,045,743	64,337,250
ULCOM SA	965,362,305	77,045,430	17,376,000	2,455,100	968,709,775	126,662,687	26,185,632	2,327,680
AMONIL SA	205,462,352	179,619,922	19,216,000	3,089,068	284,726,488	305,785,976	26,420,941	2,928,896
COMB-PIG SA	365,530,478	56,917,478	47,290,000		365,530,436	95,890,916	42,004,061	
BCR	347,145,687	7,334,500	848,000		554,082,441	5,000,224	916,190	
AVICOLA SA	45,708,203		25,862,666		95,968,699	1,243,903	38,391,384	
CERES SA	64,215,376	151,125,198	49,936,000		64,215,376	272,694,284	75,422,336	
ROMIELECOM	306,192,045	674,858	9,823,999		318,178,385	1,109,464	15,425,668	
CEREAL COM SA	63,155,796	3,058,521	8,538,667	6,783,749	332,182,798	11,583,241	12,453,848	
ELECTRICA SA	85,382,170		24,747,333	23,463,748	145,742,828		54,439,829	18,020,840
Total	2,458,227,724	475,775,907	213,838,665	100,759,225	3,145,526,786	819,970,695	306,705,632	87,614,666

The bulk of corporate tax revenues comes from corporate property taxes, namely taxes on land and taxes on buildings (9.38%, 8.00% and 11.50% of total revenues in 1998 through 2000 respectively). Next is the corporate tax on means on transportation (it is based on the displacement volume of the internal combustion engine plus on type of a vehicle or boat) and then the advertisement tax (based on the size of the advertisement sign and its location). All other taxes and fees from legal entities (like entertainment tax, stamp duties, charges for licenses and different permits) make up a negligible part of the budget.

In accordance with the aforementioned specific structure of business entities in Slobozia, most of corporate taxes are paid by a limited number of major companies (Figure 2-12), which makes collection process more manageable and revenues more predictable.

It is important to notice that companies and other legal entities, located and registered in a city, do not pay any part of their income taxes to the municipal budget, either directly or indirectly (via transfer from the national budget). The only exception pertains to Autonomous Regies, which are kind of state-owned corporations that perform essential public function (like public utilities) and therefore are regulated in a special way. This business form, patterned after the French model, was introduced in Romania by the Law on State Owned Enterprise Restructuring, # 15 of August 8, 1990 but started to emerge in earnest after the Government Ordinance # 69 of 24 August 1994. The municipality is financially responsible for the local Regie's operating results and can exercise corporate governance over it: board members are appointed by the local council, enterprise managers are appointed by the municipality.

In accounting terms, Autonomous Regies follow the general rules for commercial entities, but they are treated separately on the issues of profit tax and distribution of net profit. Profit tax of a local Autonomous Regie is paid to the respective local government budget as a direct tax. Then, according to the Government Ordinance # 23 of July 26, 1996, net profit is divided the following way: 10% constitute a profit share of employees, and from 50 to 90% goes to the local budget as a non-fiscal revenue (it is the local council which determines the percent of net profit to be transferred to its budget within this range). The share of net profit not transferred to the local authority is to be dedicated by the Autonomous Regie to development or investment purposes. Slobozia municipality used to have an Autonomous Regie that provided the city with heat, hot water, sewage and other services, but in 1998 it has been transformed into a commercial company SC Urban SA (more on specifics of Autonomous Regies and the legal status of Urban see below). Accordingly, after the transformation there are no entries in municipal budget on the lines for income tax from Autonomous Regies (the small amount of ROL 112.8 M or US\$ 6,169 in 1999 is just a late transfer due from the previous year). This change did not effect the budget in any significant way, since the total revenues from Autonomous Regies did not exceed 1% of total budget.

Structure of the budget revenues from the population is even more complicated. There are about a dozen taxes or fees that a person has to pay: property taxes (tax on buildings based on their value, separate tax on land under them based on its area, and tax on personal means on transportation), fees for using state-owned land (market use fees), fees and charges for licenses and authorizations of different kind, judicial fees and other stamp duties.

The most convoluted situation is with individual income tax. Currently, all sources of income for a person, with the exception of salary, are taxed and collected locally. There are separate taxes for income of professionals (freelancers), artisans and family associations¹, for income from rent and sub-renting², for income from royalties, copyrights, patents and other forms of intellectual property³, tax on income related to getting awards, bonuses and earnings in kind⁴, income from activities performed under concessions and franchise agreements, etc.

Individual income tax of salaried employees (which is often called salary or wage tax) is treated differently. It is withheld by an employer from the paycheck of its staff and is transferred to the local offices of Financial Administration (representative branches of the national Ministry of Finance). This tax used to go directly to the national budget and then to come back to local authorities in the form of different subsidies and transfers, mostly as special allocations with prescribed spending, and these transfers were often late or contingent on the solvency of the national budget. In order to increase local

1 These kinds of income are taxed at progressive rate from 15% to 35% for professionals and from 10% to 54% for artisans and family associations.

2 This is a flat tax of 15% payable quarterly in equal installments.

3 This tax is calculated on the year-to-day basis on the same progressive scale as the tax for professionals and is withheld by the payer at each payment. Income from inventions and innovations is taxed at flat rate of 20%.

4 This is a 10% tax.

independence, the government passed the Law on Local Public Finance (Law No. 189 of 14 October 1998), Article 8 of which stipulated that a share of the salary tax has to go to the local budgets directly and immediately from the local offices of Financial Administration. The tax is split the following way: 50% goes to the state budget, 40% to the budget of the municipality and 10% to the budget of the respective county. This provision was supposed to bring some certainty to municipal budget planning and execution, and to a significant degree it succeeded: payments from local branches of Financial Administration proved to be much more dependable than transfers before. Nevertheless, the solution is still not ironclad. The same Article 8 specifies that the quotes can be annually modified by the state budget law. And indeed, budget laws of the next years changed the municipal share of these taxes from 40% in 1998 to 35% in 1999, then back to 40% in 2000 and down to 36.5% in 2001, making any municipal long-term budget planning very difficult.

The share of salary tax is a very important source of the municipal budgets. In Slobozia, it accounted for 25.69% of the budget in 1998, 41.22% in 1999 and 50.04% in 2000. Though these proceeds cannot be formally considered "own revenues", in practice, since they are diverted to the municipal budget directly from the local branch of Financial Administration and immediately at the time of the salary tax collection, they are more reliable than almost any other external or even some internal revenues.

The disparate treatment of individual earnings obtained through salary and other sources of income was supposed to end with the passage of the Government Ordinance 73 of 27 July 1999 that introduced the new system of taxation called the Annual Global Income Tax for individual income tax collection. This ordinance defined the general term "income" and determined the different categories of income such as wages, rents, etc., as well as the different categories of taxpayers and the incomes that are to be exempted from taxation. The Annual Global Income Tax shall be determined based on the yearly income statement that all taxpayers (except those whose income consists only from salary and for whom the income statement is submitted by their employers) must submit to the local fiscal authorities according to the previous Government Ordinances 82/1998, 78/1998 and 68/1998. The tax rate ranges from 18% to 40% depending on the individual's total annual income. The shares of the new Global Income Tax will go to municipal and county budgets under the same terms and conditions that shares of the former salary tax were subject to.

The law on Global Income Tax came into force on January 1, 2000, but its practical implementation was delayed by continuous changes and amendments to it brought by Emergency Ordinance 87 of 29 June 2000, Emergency Ordinance 235 of 24 November 2000 and, most recently, Emergency Ordinance 46 of 23 March 2001. Since many issues related to the tax were still not finalized, taxpayers were allowed to delay their 2000 income tax statement until May 31, 2001.

It is difficult to predict the effect that impending enactment of the Global Income Tax system will have on municipal budgets. On the one hand, giving fiscal authorities jurisdiction over different income taxes that used to be collected by the local administration holds the promise of increased collection rate and better enforcement. On the other hand, some of these taxes not only change from own municipal revenues to transfers from local branches the treasury, but become a subject to sharing with the state and county budgets according to the ratios that can be easily amended every year. Most likely, the effect of the new system will be minimal due to the simple fact that locally collected individual income taxes of all kinds used to amount to one tenth or less of the municipal share of the salary tax, so any changes to this part of the budget are likely to be immaterial.

Overall, the revenue part of Slobozia budget seems quite stable and secure: total revenues increased from US\$ 2.45 M in 1998 to US\$ 2.97 M in 1999 and then declined to US\$ 2.35 M in 2000, all the time staying around the typical for Romania level of US\$ 45-50 per capita. Meanwhile, the share of subsidies in total revenues decreased from 37.51% to 8.49% and then to 6.64%; the share of local tax revenues steadily increased from 26.12% in 1998 to 30.82% in 2000, and the share of revenues that can be

considered dependable (own revenues plus municipal share of individual income tax collected through local Financial Administration) has grown from 60.62% in 1998 to the very high level of 93.36% in 2000.

Expenses

As was pointed out above, there is no fixed list of obligatory spending items for a municipal budget, and a municipality can be burdened with or, conversely, relieved of some economic liabilities by the passage of a new law, governmental ordinance or even an order of a Ministry. Nevertheless, analysis of the Slobozia municipal budget expenses for 1998 – 2000 (Figure 2-13 and more specific Attachment **D**) shows fairly consistent pattern of allocations among major types of expenditures: about two thirds of available funds go to the public services and development (61.84%, 63.75% and 64.07% in 1998 through 2000 respectively) and the rest shared mainly between social/cultural and administrative expenses.

Figure 2-13. Main Indicators of the Slobozia City budget. Expenses

	1998			1999			2000		
	'000 ROL	US \$	%	'000 ROL	US \$	%	'000 ROL	US \$	%
EXPENSES									
Executive authorities	3,005,775	\$ 273,875	11.19%	4,308,217	\$ 235,615	8.34%	6,103,209	\$ 236,439	9.85%
Social and cultural expenditures									
Education	3,469,205	\$ 316,101	12.92%	7,379,783	\$ 403,598	14.29%	10,213,216	\$ 395,662	16.49%
Health	214,735	\$ 19,566	0.80%	211,548	\$ 11,569	0.41%	400,000	\$ 15,496	0.65%
Culture, religion and sport and youth activities	-	\$ -	-	-	\$ -	-	85,800	\$ 3,324	0.14%
Social assistance, allowances, pensions, and other similar expenditures	2,524,748	\$ 230,045	9.40%	3,845,012	\$ 210,282	7.45%	4,662,644	\$ 180,632	7.53%
Total social and cultural expenditures	6,208,688	\$ 565,712	23.12%	11,436,343	\$ 625,449	22.15%	15,361,660	\$ 595,113	24.80%
Public services and development									
Street maintenance and repair	1,631,611	\$ 148,666	6.08%	6,236,522	\$ 341,073	12.08%	11,191,964	\$ 433,579	18.07%
Street lighting	797,002	\$ 72,620	2.97%	817,395	\$ 44,703	1.58%	1,283,147	\$ 49,709	2.07%
Street cleaning	724,816	\$ 66,042	2.70%	1,024,000	\$ 56,002	1.98%	2,400,427	\$ 92,993	3.88%
Parks, public gardens and leisure areas	1,905,932	\$ 173,661	7.10%	1,706,796	\$ 93,344	3.31%	2,952,706	\$ 114,388	4.77%
Dwellings	1,374,514	\$ 125,240	5.12%	-	\$ -	-	104,917	\$ 4,065	0.17%
Water supply, treatment and pumping stations	3,662,053	\$ 333,672	13.64%	1,435,553	\$ 78,510	2.78%	770,629	\$ 29,854	1.24%
District heating networks, boiler houses and substations	3,733,921	\$ 340,221	13.90%	18,212,926	\$ 996,058	35.28%	11,125,322	\$ 430,997	17.96%
Sewage	-	\$ -	-	105,916	\$ 5,793	0.21%	946,627	\$ 36,672	1.53%
Introduction of natural gas in municipalities	599,842	\$ 54,655	2.23%	550,114	\$ 30,086	1.07%	3,154,419	\$ 122,203	5.09%
Other actions for public services and development	2,177,028	\$ 198,362	8.11%	2,823,845	\$ 154,435	5.47%	5,758,557	\$ 223,087	9.30%
Total public services and development	16,606,719	\$ 1,513,141	61.84%	32,913,067	\$ 1,800,004	63.75%	39,688,715	\$ 1,537,548	64.07%
Agriculture and forests	-	\$ -	-	131,838	\$ 7,210	0.26%	50,377	\$ 1,952	0.08%
Transport and communications	-	\$ -	-	-	\$ -	-	-	\$ -	-
Expenditures with special destination	-	\$ -	-	2,249,613	\$ 123,031	4.36%	58,676	\$ 2,273	0.09%
Financial expenditures									
Interest payments accrued due to the loans from the treasury fund	28,669	\$ 2,612	0.11%	22,500	\$ 1,231	0.04%	-	\$ -	-
Repayment of the principal amount for the loans from the treasury fund	999,781	\$ 91,096	3.72%	499,996	\$ 27,345	0.97%	-	\$ -	-
Total financial expenditures	1,028,450	\$ 93,708	3.83%	522,496	\$ 28,575	1.01%	-	\$ -	-
Other expenditures	5,755	\$ 524	0.02%	66,434	\$ 3,633	0.13%	678,774	\$ 26,296	1.10%
TOTAL EXPENSES	26,855,387	\$ 2,446,960	100.00%	51,628,008	\$ 2,823,517	100.00%	61,941,411	\$ 2,399,621	100.00%
TOTAL REVENUES	26,855,387	\$ 2,446,960	100.00%	54,281,602	\$ 2,968,641	100.00%	60,659,468	\$ 2,349,958	100.00%
SURPLUS/DEFICIT	-	\$ -	-	2,653,594	\$ 145,124	4.89%	-1,281,943	\$ -49,663	-2.11%
<i>Exchange Rate ROL/US\$</i>	<i>10,975 at December 31</i>			<i>18,285 at December 31</i>			<i>25,813 at December 31</i>		

Among positive trends of the budget one can observe a decrease of the share of administrative expenses (from 11.19% of the budget in 1998 to 9.85% in 2000), as well as the slight growth of the share of social and cultural expenses of almost every kind (from total 23.12% in 1998 to 24.80% in 2000, with spending on education growing the fastest, from 12.92% to 16.49%). There are no municipal expenses on transport and communications while expenses related to such items as agriculture and forests or are insignificant (less than 0.5%) and change from year to year with no obvious pattern. Another positive development is the drop in financial expenses from 3.83% in 1998 to zero in 2000, which is related to decreasing amount of loans from the treasury fund that the Municipality had to take.

The numbers for different public services and development expenses, which change from year to year but amount to basically the same total in hard currency equivalent, indicate constantly increasing amount spent on street maintenance and repair (from 6.08% to 12.08% and to 18.7% in the years 1998 – 2000 respectively) and about the same share (4-5%) for street cleaning and lighting. Another major line of expenses for public services and development is called “District heating networks, boiler houses and substations”. Generally, this line would include all the expenses, operational and capital, that relate to district heating. In case of Slobozia, the figures on this line reflect both capital investment (like rehabilitation of the heating main connecting district heating network with Amonil) and heat subsidies passing through from national budget to the public service utility. Changes of these numbers (from 13.90% in 1998 up to 35.28% in the next year and then down again to 17.96% in 2000) do not convey any meaningful tendency, since they are determined by the schedule of investments and relative dynamics of fuel prices versus approved tariff levels. There was considerable investment made in the water supply, treatment and pumping stations (13.64% of the budget in 1998), and now the Municipality increases amounts of funds for sewage system rehabilitation (from 0.21% in 1999 to 1.53% in 2000). Finally, one should note quite high percentage of funds directed on such not-obligatory, quality-of-life type expenditures as parks, public gardens and leisure areas (7.10%, 3.31% and 4.77% of the budget in 1998 through 2000).

The comprehensive analysis of the risks related to different revenue sources and expense items of the Slobozia budget is beyond the scope of this work. It is safe to assume that the risks of adverse changes to the corporate and personal property taxes should be relatively low; risks related to the municipal share of the personal income tax are unclear due to introduction of the Global Income Tax system and unreliable forecasts of unemployment level in the region; risks related to the timely transfers of heat subsidies is moderate (and in any case, the share of heat subsidies in revenues is minor). The main conclusion is that the Slobozia budget has a significant amount of funds allocated to non-obligatory items that should be enough to back up a reasonable debt guarantee or ensure the debt service (if the council decides to take the loan).

Additional Considerations

Financial performance of the Municipality has been uneven. In 1998, the revenues and expenses were balanced, the year 1999 was finished with 4.89% surplus, and in 2000 the Municipality ended up with 2.11% deficit. On the other hand, the Municipality reliance on external borrowing has been diminishing. Since 1998, the municipality has not taken any treasury or commercial loans and is currently debt-free.

The issue of municipal assets that would be available as collateral for future loans needs additional examination (See the list of assets in the Attachment E). The legal status of most assets is not yet clear. Municipality owns ten buildings, including stores, markets and commercial center, with book value of roughly 7,000,000,000 ROL (US\$ 270,000 as of December 31, 2000). The fair market value of these assets is undetermined but should be considerable. Unfortunately, legal difficulties of utilizing land and real estate as collateral in Romania are such that they effectively restrict the use of this instrument to domestic lenders only.

3 Public Service Utility

3.1 General description

As a commercial company, Urban was established in December 1998, though the same people and facilities have worked to provide Slobozia with urban communal services for years. In accordance with the continuing changes of Romanian legal framework, the formal status of the entity that delivered to Slobozia residents and businesses the services of district heating, water supply and sewage have changed a number of times.

Initially, after the collapse of the socialist regime, there was an attempt to introduce locally controlled and financed entities that would run on the purely economic principles and at the same time would serve vital public interests – Autonomous Regies. This attempt was not completely successful. Numerous legal issues related to Autonomous Regies have never been settled. As originally formulated, Autonomous Regies owned their assets and had the right to freely possess, use or dispose of them in accordance with the law and the terms of their charters. At the same time, this independence was illusory, since on any significant issue an Autonomous Regie was controlled by a local, county or national “managerial body” (council or ministry) that created the Regie. In addition, there were various problems with differentiating county authority as opposed to local authority in managing Regies, so even when the administration of a Regie and the local council were in agreement, a decision could be hindered by the county authority.

Government Ordinance #69 of 26 August 1994 tried to clarify the legal status of Regies by defining as local those serving municipalities with more than 30,000 inhabitants and dealing with delivery of water, district heating and urban transport services, in addition to construction and maintenance of local housing, roads, bridges and public areas. A single Regie was supposed to perform all of the above functions in municipalities with a population of less than 300,000, while the bigger municipalities could have up to two Regies, and the city of Bucharest could have three. Still, the problem related to the ownership of public assets, that most Regies operated with, were never fully resolved, their decision-making was hamstrung, and performance of many Regies remained unsatisfactory. Therefore, on June 16, 1997 by Emergency Ordinance # 30 the Romanian Government prescribed within six month to liquidate those Regies that were insolvent and to reorganize the other into commercial companies that would later undergo the privatization process. Therefore, the Autonomous Regie in Slobozia became a commercial company SC Urban SA. At the same time all the public assets, which used to be under the ownership of the Autonomous Regie, under the Law on Public Property # 213 of November 17, 1998 went back into public domain and became inalienable public property that was given by the local council to Urban into concession.

The concession agreement between the City Council (represented by the mayor) and Urban is for 10 years with a possible extension for another 5 years. The agreement grants to the Company legal and administrative authority to operate assets of district heating, water delivery and sewage systems with the expressed purpose of providing municipal services to Slobozia residents. Urban retains general and operational control over operations and services as well as responsibility for billing and collection, while the Municipality has a right of access to all information. In exchange for the concession rights, Urban has to pay to the Municipality royalties in the amount equivalent to the depreciation of the conceded assets (adjusted by the degree of equipment utilization). The payments, which are to be made quarterly, go to the special fund for upgrade, rehabilitation and other capital investment in the municipal infrastructure that is used in the delivery of district heating, water supply and sewage services. In accordance with the agreement, the rehabilitation works are performed by Urban, and a protocol acknowledging this fact is

signed by both parties. Therefore, the Municipality is financially responsible for capital improvements to the municipal infrastructure, while Urban is responsible for current repairs and maintenance.

The agreement does not impose on the concessionaire some fairly common obligations, like the obligation to serve, which are standard for any regulated public utility. Actually, all five obligations of Urban under the agreement (Article 29) are quite limited – like operating the system, undertaking appropriate repair and maintenance and providing the Municipality with technical and financial reports and other information as necessary. On the other hand, among four obligations of the Slobozia City Council (Article 28), in addition to the obligation to ensure the financing sources for the adopted work program or to build new capacities in order to deliver the services, there are some unusual items like the pledge to arbitrate possible conflicts between Urban and main heat and water supplier, Amonil.

This atypical (for a regular public utility) concession agreement reflects the current Romanian reality: high cost of the services, which is caused by the rising prices of fuel and general deterioration of the municipal infrastructure and, in turn, creates the need in governmental subsidies, especially for capital investment. Therefore, the agreement puts most of the burden for maintaining and upgrading municipal infrastructure on the City Council. The agreement also clearly indicates that, for social and political reasons, the municipality is willing to support financial viability of the public service utility in a number of other ways, if necessary and possible.

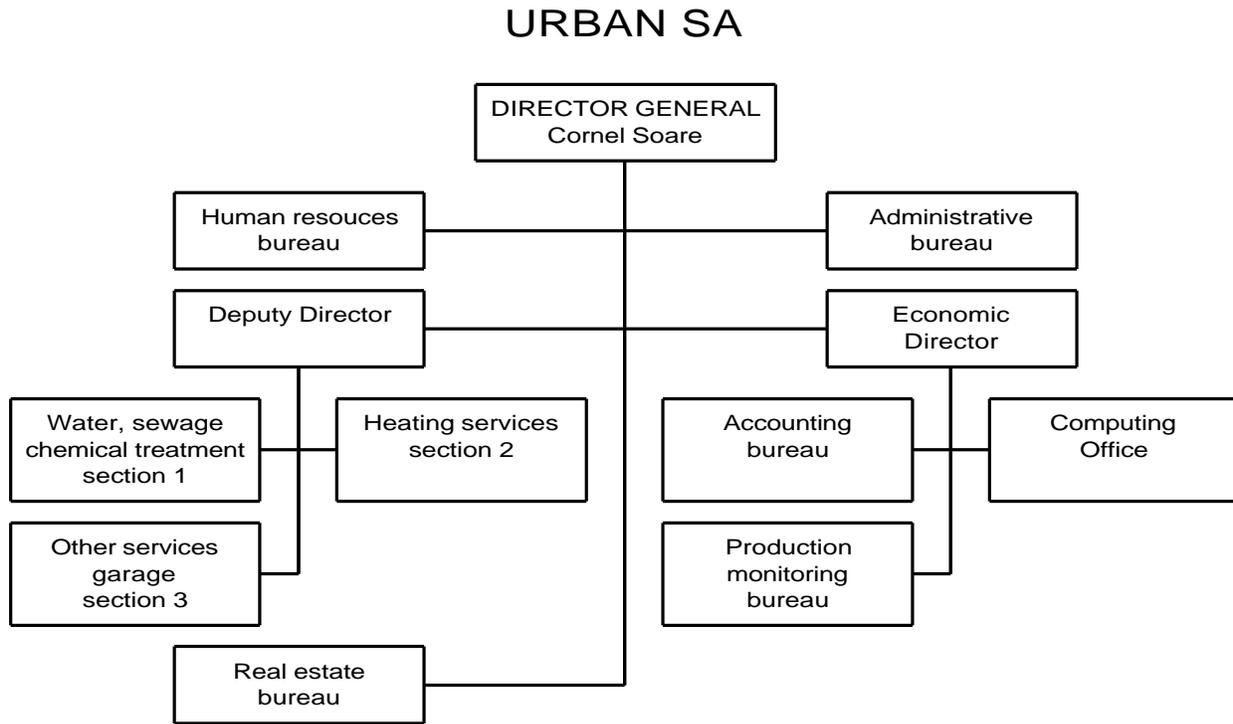
Figure 3-1. Senior Management of Urban

Name	Current Position	Responsibilities	Occupied since	Education	With the Company since	Previous Position	Occupied from
Cornel Soare	Director	Management	1990	University	1984	Head of Construction Works	1984
Ion Cosman	Deputy Director	Technical Department	1990	University	1985	Head of unit	1985
Maria Stan	Economic Director	Economic Department	1999	University	1999	-	-

Urban is 100%-owned by the local council and governed by the general assembly of shareholders who are the members of the Local Council appointed to this position. The meeting of shareholders appoints General Manager of the company who, in turn, selects technical and economic directors (see Figure 3-1).

Urban currently has the staff of 462 people. As one can see from its organization chart (Figure 3-2), the Company structure is centered around main municipal services: district heating and domestic hot water delivery, potable water distribution, sewage collection and treatment, etc. (water distribution and sewage-related functions are united in one water services department). Separate branches represent other functions (human services or accounting departments). One unusual entity in the structure of Urban is the real estate bureau that manages the construction and sale of apartment building that the Company undertakes on behalf of the Municipality (more on that below).

Figure 3-2. Organization Chart of Urban



3.2 Main Business Activities

Since the time it was a Department of the County Company for municipal services and then Regia Autonome, Urban is used to perform a number of business activities, from providing the residents and commercial customers of Slobozia with district heating and domestic hot water to garbage removal or street cleaning. Now, in addition to four main business activities (district heating and DHW, water supply, sewage collection and wastewater treatment), Urban is engaged in the following auxiliary works:

1. connection of new customers (mainly individual households not connected to sewage or central district heating system) to the water supply network;
2. installation and repair of water meters;
3. renting out some specialized vehicles: sewage pumps, trucks, etc.;
4. running a store at the paid beach of the city (the store, as well as the beach itself, is given to Urban in concession for 10 years);
5. renting out some commercial space in freestanding buildings that belongs to Urban;
6. selling to companies and individuals excess materials used in production;
7. executing special contracts with the Municipality, including work on capital investments in the municipal infrastructure.

A very important secondary activity for Urban is managing residential construction for the Municipality. For the last several years, Urban has been receiving funds from the local budget in order to build

residential apartments and to sell them to local residents – in essence, issuing mortgages for Slobozia households. Urban itself is not involved in construction but rather acts as a prime contractor, performing oversight for a small fee. Still, this activity has a significant effect on Urban profit and loss statement and balance sheet.

District Heating and Domestic Hot Water

Providing district heating and DHW is, doubtless, the main part of Urban business, at least if to judge by its share in operating revenues and expenses (59.4% and 55.8% in 2000, respectively). Overwhelming majority of Urban heat customers is households who contract with the Company indirectly – through residential associations. Urban provides heat and DHW to 765 apartment buildings that house about 37,000 people, or two thirds of the city population. Although the number of contracts with residential associations is only 328, or 45.5%, out of the total 721 (see Figure 3-3), their share in heat revenues amounts to 91.8% and their consumption of heat measured in gigacalories is even higher – 92.9% of the total (Figure 3-4; all the numbers cited for the year 2000). In addition to residents, Urban supplies heat to private and mixed-ownership companies, schools, health and other budgetary organizations.

Figure 3-3. Structure of Urban Customers by Category

Heat	1998		1999		2000		2001 (forecast)	
	(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
Residential (Apartment building associations)	48	91,6	100	92,5	328	92,9	400	93
All others								
Companies, private or mixed ownership	370	2,6	420	2,4	363	2,4	330	2,3
Schools	26	3,3	23	2,8	16	2,7	16	2,7
Health organizations	4	1	4	1	5	1	5	1
Other budgetary organizations	23	1,5	12	1,3	9	1	9	1
All others total	423	8,4	459	7,5	393	7,1	380	7
Grand Total	471	100	559	100	721	100	780	100

A closer look at the figures 3-3 and 3-4, though, reveals a disturbing picture: the amount of heat delivered to the customers, as well as the heat revenues in hard currency equivalent, are steadily declining - from 193,200 Gcal in 1998 to 147,700 Gcal in 2000, or the drop of 23.6%. To some degree, in the year 2000 the decrease could be explained by an unusually warm weather. But in all likelihood, the trend has more to do with the high cost of service, rising price of fuel, continuing inefficiency of the system and the fact that Amonil, the major heat supplier of the Company, does not deliver enough heat to the city due to both technical limitations and late payments from Urban.

Figure 3-4. Delivery of Heat to Urban Customers

Heat	1998		1999		2000	
	(Gcal)	(%)	(Gcal)	(%)	(Gcal)	(%)
District Heating						
Population	86,876.90	45.0	84288.76	48.1	81,672.09	55.3
Economic entities	4,135.29	2.1	3,515.79	2.0	2,934.38	2.0
Budgetary organization	10,297.72	5.3	9,405.25	5.4	6,595.28	4.5
District Heating Total	101,309.91	52.4	97,209.80	55.5	91,201.75	61.8
DHW						
Population	90,206.44	46.7	76,882.99	43.9	55,625.11	37.7
Economic entities	928.09	0.5	751.47	0.4	546.02	0.4
Budgetary organization	754.89	0.4	244.77	0.1	288.33	0.2
DHW Total	91,889.42	47.6	77,879.23	44.5	56,459.46	38.2
Heat Total	193,199.33	100.0	175,089.03	100.0	147,661.21	100.0

The picture is even clearer and more alarming from the data for so-called “cut-offs” – requests by customers to be disconnected from the heating network (Figure 3-5). In case of individual apartments within an apartment building, Urban does not have to satisfy such requests (also often it does when the technical conditions permit), but in case of economic entities in detached buildings or a decision by an residential association as a whole, there is nothing Urban can do to prevent the disconnection and lost of the customer. For population, heat supply is at least subsidized by the government (see below on heat tariffs and subsidies). But for independent economic agents and budgetary organization, which must pay the full price, Urban heat supply more and more often proves to be not affordable, so they are forced to do without it or find other solutions.

Figure 3-5. The History of Cut-Off Requests by Urban Customers

Cut-off Requests	1998		1999		2000		2001 (forecast)	
	(#)	Heat Demand Reduction (Gcal)	(#)	Heat Demand Reduction (Gcal)	(#)	Heat Demand Reduction (Gcal)	(#)	Heat Demand Reduction (Gcal)
Population	26	3000	149	15,912	381	23,874	150	400
Economic entities	18	300	28	796	57	787	-	-
Budgetary organizations	10	300	14	1,402	9	2,766	-	-
Total	54	3600	191	18,810	447	27,427	150	400

These indicators underscore a very serious problem for Urban: the retention of customers. Even though the Company management estimates heat demand for the next three years at 216,000 Gcal/year, this forecast, calculated based on the number of apartments, commercial spaces and the population connected to the DHS and boiler houses in compliance with official methodology (Government Ordinance # 16/90), may prove too optimistic. Slobozia has a Master plan for the city development, and no renovation works of the housing stock or major new construction is envisaged. As a public service utility, the Company has captive clientele and no direct competitors (other than its own inefficiency). But Urban must dramatically improve its performance, both in terms of cost-effectiveness and the quality of service, otherwise it risks losing even such usually inert customers as residential. The dependence on heat purchases from Amonil only exacerbates the problem. The good news is that the installation of new, more efficient boilers will provide an opportunity for Urban to upgrade its infrastructure, modernize technology and improve performance, thus keeping the customers it has now or even regaining some that recently left.

Other Major Municipal Services.

In addition to heat, Urban also supplies Slobozia with potable water and maintains the sewage collection and treatment infrastructure. The Company buys pretreated water from Amonil, distributes it to the population, then collects sewage and, after treatment, discharges it into Ialomita River. Urban has to pay to Amonil for received water and to the national water company Apele Romane for the discharge.

Urban also has a number of auxiliary business activities, some directly related to its main functions, like the connection of new customers to the water supply network, some quite extraneous, like running a store at the city beach. Revenues and expenses of these activities are insignificant as compared to the main services, with the exception of construction and sale of residential building for and on the funds of the Municipality. The volume of services in physical or monetary units and the structure of customers for each service for the last three years are represented in the Figure 3-6.

Figure 3-6. Delivery of other municipal services to Urban customers

Other Major Services	1998		1999		2000	
	(unit)	(%)	(unit)	(%)	(unit)	(%)
Water, m³						
Population	6,236,697	73.7	5,554,141	77.4	3,921,238	70.0
Economic entities	1,848,640	21.9	1,299,329	18.1	1,379,039	24.6
Budgetary organizations	375,180	4.4	323,892	4.5	299,115	5.3
Water Total	8,460,517	100.0	7,177,362	100.0	5,599,392	100.0
Sewage and wastewater treatment, m³						
Population	5,055,609	83.8	4,501,312	77.7	3,068,303	74.8
Economic entities	769,203	12.8	969,001	16.7	772,598	18.8
Budgetary organizations	204,999	3.4	320,751	5.5	261,400	6.4
Sewage Total	6,029,811	100.0	5,791,064	100.0	4,102,301	100.0
Other Activities, '000 ROL						
Population	5,460,280	84.3	4,693,969	81.4	3,059,432	71.4
Economic entities	810,002	12.5	752,055	13.0	966,052	22.5
Budgetary organizations	204,115	3.2	320,614	5.6	261,100	6.1
Other Activities Total	6,474,397	100.0	5,766,638	100.0	4,286,584	100.0

For all services the population is the main customer (the population's share in the services exceeds 70%). The physical volume of all services indicates the same downward trend as the district heating and DHW. Despite the slight growth of the revenues in Romanian Lei, the amount in hard currency equivalent declines with the roughly same rate as the physical volume, which means that the tariffs for water supply, sewage and wastewater treatment generally get adequately adjusted for inflation.

3.3 Tariff Setting Procedures

Tariff Setting Procedures for District Heating and DHW

As a regulated public utility, Urban must have its tariffs for municipal services approved by an independent public authority (Law # 21 of 1996, or Law on Competition; also, Law # 88 of May 25, 1999). Initially, Romanian national Office of Competition used to be such authority for all Urban activities, but in October 1998 the Romanian Government by the Emergency Ordinance # 29 (later approved by the Law 218 of June 2, 2000) created a separate legal entity – National Regulatory Authority in the Energy sector (ANRE), which after March 1999 has taken over the task of approving tariffs for heating and DHW. ANRE is an autonomous public institution that “creates and applies the system of obligatory regulation on a national level, necessary for the efficient functioning of electricity and heat market in order to ensure competition, transparency and consumer protection” (Article 3).

In 1999 rising cost of fuel and other expenses that brought about high heat tariffs forced the Romanian Government to address the consumer protection problem. This was done by issuing the Emergency Ordinance # 162 of October 28, 1999 “On the establishment of the National Reference Price for heat delivered to the population through centralized systems and on financial help to disadvantaged categories of the population”. The Ordinance ended the previous practice of restricting the level of heat tariffs for producers (see, for example, the Government Decision # 239 of May 29, 1997) and established the maximum national level at which Romanian residents could be charged (National Reference Price). If the actual production and distribution costs of a public service utility were higher than this price, the utility still could have the tariff approved, but the difference was supposed to be covered by the subsidies from national and local budgets. Thus, the Ordinance introduced a new non-targeted subsidy – national subsidy for heat. In addition to this non-targeted subsidy, there were established new targeted subsidies for the households with very low incomes that were supposed to cover a part of the heat tariffs even below the National Reference Price and were to come from local budgets (Art.11). The level of the National Reference Price was calculated as the average of local heat prices for producers that use natural gas plus related distribution tariffs (Art.2). The first level of the National Reference Price was established as 230,000 ROL/gigacalory (Government Decision # 879 of October 28, 1999).

The current predicament with heat subsidies creates a number of contradicting motives and incentives for main players: municipalities, public service utilities, the national government, and ANRE. Since the national government shoulders the burden of heat subsidies, it is logical that heat tariffs get approved not by local but by the national regulatory agency (ANRE). On the other hand, it should be much more difficult for located in Bucharest ANRE staff than for some municipal or county regulators, intimately familiar with the local specifics, to judge how justified requested tariffs are. In a way, the situation creates perverse incentives for municipalities, which own the public service utilities, not to scrutinize the behavior and business practices of these utilities but to approve and consent to overblown tariff requests in the hope of obtaining additional subsidies from the national budget. At the same time, even after the tariff is approved, a municipality never can be sure that it will receive heat subsidies from the central budget in full. As stated in the Article 4 of the Emergency Ordinance # 162, “the difference between the bigger local price and the national price of reference shall be covered as follows:

- a) from the State Budget within the limits of the approved sums destined for such cases;

b) from the local budgets (from the local income) for the part which was not covered by the State Budget.”

It means that whatever shortage in heat subsidies is left after national budget appropriation, a municipality will have to cover it from local funds. Indeed, the practice of several last years indicates that as fuel prices rise, the national government is able and willing to support smaller and smaller share of heat subsidies. It is quite obvious that the total elimination of centralized heat subsidies is the question of “when”, not “if”.

In case of Urban, the situation with heat tariffs is further complicated by purchase of heat from Amonil. Tariffs for heat from Amonil, as a wholesale supplier, also get approved by ANRE – usually on the level similar to the wholesale heat tariffs for cogeneration power plants of Termoelectrika. There are two wholesale heat tariffs for Amonil – the higher in winter, when heat is generated by dedicated gas-fired boilers, and the lower in summer, when heat is recovered in the process cooling. For residential customers that are connected to substations getting heat from Amonil, the end-user price is determined by the heat generation tariff of Amonil and transmission and distribution tariff of Urban. For the rest of district heating and DHW customers, the price of heat depends on Urban generation and transmission/distribution costs.

Formally, the Law # 88 of 1998 and subsequent regulations stipulate the procedure of reexamination (change in structure) and adjustment (change in value) for heat tariffs and other regulated tariffs and prices. As a rule, reexamination is made every three years but in special cases (restructuring of the utilities or structural modifications to the costs if these modifications result in variations of more than 5%), reexamination is allowed more often, but no sooner than three months after the last. Adjustment of prices and tariffs may be done monthly if any of the adjustment parameters has changed more than 5% and if the resulting impact of the modifications of all the adjustment parameters is more than 5%. The adjustment parameters are:

- a) the exchange rate ROL/USD as calculated by the National Bank of Romania;
- b) consumer price index published by the National Commission on Statistics;
- c) fuel prices;
- d) prices for electricity and water.

The procedure for heat tariff approval starts with Urban. Economic Director and accounting department of the Company, based on the data provided by the technical and human resources departments, prepare a breakdown of the revenues and expenditures for the past 12 months and a forecast for the future 12 months, starting with the month in which the modification is requested. For each item in the breakdown, the justification of the numbers is included (e.g., number of employees, repair plan or data on losses). This tariff adjustment proposal is signed by the Director and then goes for review by the City Hall. After approval, it is signed by the Mayor and can be taken to ANRE office in Bucharest for a formal consideration. There is no formal procedure for tariff consideration by ANRE. Sometimes just submitting the documents is enough; sometimes getting a tariff adjusted requires several additional submissions and discussions with ANRE staff.

According to Urban management, a new tariff is usually approved below the level of actual cost registered at the moment of submitting the application. At the last request for the heat tariff increase, Urban asked for tariffs of 363,413 Lei/Gcal for heat generation on natural gas and 198,320 Lei/Gcal for heat transmission and distribution; the Company received increases only to 346,000 Lei/Gcal and 152,000 Lei/Gcal respectively. The Figure 3-7 indicates the history of changes to Urban heat tariffs.

Figure 3-7. The History of Changes in the Approved Heat Tariffs and Costs for Urban

ROL/Gcal	Approved and Effective since										
	May 18, 1998	June 31, 1998	Oct 18, 1998	Mar 1, 1999	June 17, 1999	Nov 1, 1999	July 17, 2000	July 25, 2000	Sep 20, 2000	Feb 1, 2001	Current
Approved Heat Tariff											
for population	97,800	118,250	137,585	175,800	243,880	258,035		291,500			346,000
for other customers	97,800	118,250	177,115	214,575	213,880	258,035					346,000
Cost for purchased heat	53,500	57,360		104,000		156,000	95,000		126,000	106,000	218,000
Transmission and distribution cost	51,500	-	81,450	72,625	83,570	91,010		98,000		137,900	152,000
National Reference Price	N/A	N/A	N/A	N/A	N/A	230,000	230,000	230,000	230,000	350,000	550,000

Calculations of the tariff are quite simple (see Figure 3-8), but justification of each cost item may be detailed. The list and structure of allowable expenses were approved by the Government Emergency Ordinance # 7 of March 30, 1998 and later (after creation of ANRE) amended by the Government Emergency Ordinance # 150 of September 28, 2000. Most of the operating expenses are well defined, documented, and reported and therefore are not subject for long discussions. The quantity of heat delivered is slightly more difficult to prove, especially in cities where there is no comprehensive measuring of heat flow, which are most of Romanian cities. In such cases, the amount of heat supply is calculated based on the amount of fuel used and the efficiency of the system. This last parameter is also open to discussions and negotiations, with ANRE trying to use the standard (normative) efficiency of the equipment and companies arguing that the equipment has deteriorated and now operates with considerably higher losses.

Tariff structure includes profit margin, but there is no formal regulation on what this margin should be, and this item is usually the subject of strenuous negotiations between a public service utility and ANRE. The common level is 5%, but if ANRE wants to support a company that, for instance, is investing its funds into some network upgrade or rehabilitation, such company can temporarily get a higher profit margin – 8% or even 10 %.

Figure 3-8. The Structure of Allowable Expenses for Tariff Calculation

- I. Total Cost (A+B)
 - A. Operating Expenses (1+2)
 - 1. Material costs (1.a+1.b)
 - a) Variable material costs
 - (1) Electricity
 - (2) Other variable costs
 - b) Fixed material costs
 - (1) Raw materials, materials
 - (2) Non-technological fuel
 - (3) Depreciation
 - (4) Royalties
 - (5) Current repairs
 - (6) Repairs undertaken by third parties
 - (7) Studies and research
 - (8) Other services provided by third parties
 - collaborations
 - commissions and honoraria
 - public relation and protocol services
 - business trips and meetings
 - mail and telecommunication
 - (9) Other fixed costs
 - (10) Costs related to modernization and upgrade of the metering system
 - 2. Labor costs
 - a) Salaries
 - b) Social security tax
 - c) Required contributions to unemployment fund
 - d) Required contributions to health, risk, education and other funds
 - e) Other costs related to employees
 - B. Financial costs
 - 1. Loan interests
 - 2. Bank commissions and fees
 - 3. Cost resulting from the fluctuations of the currency exchange rates
- II. Profit
- III. Revenues from heat supply activity (I+II)
- IV. Quantity of heat delivered

As Figure 3-8 demonstrates, there are allowable financial expenses in the structure of tariff calculation. These financial expenses can include loan interests but do not provide Urban with any means to undertake upgrade and rehabilitation of its system. Even though depreciation of the assets is included in the cost structure (item I.A.1.b.3), the reality of high inflation coupled with slow and incomplete reevaluation of the assets results in the situation when accumulated depreciation is not enough to replace the assets that have passed their useful life. And the development of the system, as opposed to direct and urgent replacement of failing parts, is not provided for at all.

Since the Company is not the owner of the assets, it would not make any sense for Urban to invest its own funds into upgrading the infrastructure if the Company were precluded from recovering these investments

through increased tariffs. On the other hand, the Municipality as the owner of the assets is directly interested in upgrading district heating networks and other parts of municipal service infrastructure but can hardly afford investment due to budget constraints. One reasonable way for the Municipality to ensure not only routine maintenance (which is the part of concessionaire's obligations) but also the continuing development of the municipal infrastructure would be to charge a concessionaire royalties for use of the assets in the amount sufficient for. Royalties are a part of allowable operating expenses (item I.A.1.b.4), so there would not be any problems for Urban with recovering these expenses through tariff. On the other hand, since according to the Law # 15/1990 and the Government Decision # 1228/1990 that govern concessions in Romania, the level of royalties is a matter of direct negotiations between the two parties, nothing precludes Slobozia Local Council from requesting royalties that would cover the cost of system upgrade. Nevertheless, the current concession agreement between Urban and the Local Council includes royalty calculated only at the obviously inadequate level of officially authorized depreciation. Future amendments to the agreement, inevitable as new assets are installed and transferred into operation of the Company, provide an opportunity to properly address the issue.

Tariff Setting Procedures for Other Public Services

A situation with tariffs for other Urban services is very similar to the one described above with only the difference that these other tariffs are finally approved not by ANRE but by the Office of Competition. They are also periodically adjusted to the current level of inflation and changes in the costs incurred.

The accounting department monitors the economic result of each activity and they have to be positive (which is not always the case). To request a change of tariffs, the department develops a spreadsheet in which it includes all the production data for the last three months and the previous year, breakdown of customers (population and other consumers), types of expenditures, number of employees involved in each activity and resulting revenues and profit or loss. The same breakdown is presented for the current level of tariff and for requested tariff.

According to Urban, no increase of tariffs is granted if the Company has made profit on the respective activities. Moreover, during the year 2000, due to the implementation of the Government Decision # 472/2000 on wasted water, Urban incurred exceptional increases in expenses for wastewater treatment (the invoice from the national water utility Apele Romane in accordance with the aforementioned decision was two times higher than expected). In October 2000, the Company requested an appropriate increase in tariffs based on these expenses and the growth of consumer price index for September, but the tariff was approved taking into consideration only the value of consumer price index for June.

Figure 3-9. The History of Changes in the Approved Water and Sewage Tariffs for Urban

ROL/m ³	Approved and Effective Since								
	June 19, 1998	Oct 26, 1998	Feb 15, 1999	Mar 12, 1999	June 9, 1999	Nov 20, 1999	Mar 3, 2000	Nov 3, 2000	Proposed
Approved Tariff for Water Supply									
For population	1,070	1,157	1,234	1,580	1,817	2,225	2,642	3,144	3,434
For other customers	2,690	2,690	2,870	3,000	3,000	3,020	3,020	3,594	3,900
Approved Tariff for Sewage Collection									
For population	415		443	527	615	769	922	1,097	1,198
for other customers	1,050		1,120	1,050	1,050	1,050	1,050	1,250	1,358
Approved Tariff for Wastewater Treatment									
for population	205		219	259	306	382	462	550	975
for other customers	630		672	630	630	640	640	762	1,354

The history of changes for these tariffs is indicated in the Figures 3-9. Analysis of the trends shows that during two years from the Fall of 1998 to the Fall 2000 tariff for water service for population increased 3.21 times, for other customers – 1.45 times; combined tariff for sewage collection and wastewater treatment from household grew 3.5 times, from economic entities and budgetary organization – 1.61 times. For comparison, an official Romanian data for the same period of time indicated inflation about 90%, and currency exchange ratio from Romanian Lei into US Dollars increased 2.59 times. In other words, the growth of the tariffs for municipal services to population was faster than not just the official inflation data, but even currency exchange rates. Tariffs for non-residential customers grew slower, but only because they were higher to start with. Attempts of Electrotek team to analyze profitability of different activities were limited by the fact that Urban bookkeeping practices were not fully up to the task, and specific revenues and expenses were not always properly allocated by the activity.

3.4 Contractual Arrangements with Customers and Billing

Contract for Heat Delivery

In accordance with the general Romanian law, relationships between a public service utility and its customers should be governed by specific contracts the form and substance of which are left to the discretion of the parties. Nevertheless, ANRE has developed, among others, a standard framework contract for heat supply (ANRE decision # 70 of December 1999). Urban uses a similar typical contract for supplying thermal energy and customers rarely make changes to this boilerplate text.

Each economic entity or budgetary organization is a separate customer that signs a heat supply contract with Urban. In the case of people living in apartment buildings, a residential association is the legal entity that signs the contract.

The contract pays most attention to technical issues. Its main thrust is to ensure that the system is appropriately operated by both the supplier and consumer and no unauthorized alteration occurs. Article 3 stipulates the boundaries of a heating season (it starts with registering for three consecutive days, between

6:00 PM and 6:00 AM of the average outdoor temperature of +10 0C or less and ends when the average outdoor temperature exceeds +10 0C for the same interval or based on of the recipient sends a written request). The consumer rights are not explicitly enumerated but in general they are encompassed in a number of articles scattered in the text. The contract also specifies economic sanctions Urban can apply to non-paying or late-paying customers, up to forced disconnection.

Billing Procedure

According to the practice, as well as to the standard contract, there is monthly billing for all customers. Generally, it should be done based on the measurements of the used thermal energy, but in many cases, due to the absence of meters, the amount of consumed heat is calculated in accordance with approved regulations.

The heat and hot water meters are read between the 20th and 24th of each month at customer sites and on the 30th at the boiler houses. The primary data collected in the field is introduced in the computer and the established calculations are processed. The result is water, sewage, water treatment and heat consumption per person or per square meter. The consumption is multiplied by the tariff of that month and the values per apartment, association or economic entity are obtained.

When no meters are present, economic entities are billed according to paushal system (depending on the kind of activities) and agreement with the Company (Ministry of the Public Works Order # 29N from 1993). Heat supply to residents and organizations subordinated to local councils is estimated differently. Specifically, total quantity of heat supplied Q_{total} is determined by the calculation:

$$Q_{total} = C_c \times P_i \times N_{eff}, \text{ where}$$

C_c is fuel consumption measured in volume;

P_i is the lowest heat content of the fuel according to the analysis presented by the supplier;

N_{eff} is actual average efficiency of the system established by the regular measurements.

Residential associations, after receiving the total heat bill, have to split it between individual apartments. Households are billed for space heating based on the apartment area and for hot water based on the number of residents in the household.

The bills are issued between the 6th and the 9th of a month for the previous month and are sent to the customers through URBAN SA employees. For the bills not paid in the following 30 days from the issuing of the bill, the penalty is calculated 0.2% per day for the delayed payment applied to the unpaid value (according to the Law # 198 of November 17, 1997). Presidents of the associations might come to the Company or billing centers to get the bills and then collect the money from the households and deliver it to Urban. Individual residential customers receive a written notice and get a receipt when they pay the bill at a Company's billing center.

Collection Rate

According to contract, an invoice is due 30 days after the date of its issue, and the late payment fee in the amount of 0.2% for each day of delay, beginning with the 31st day after the invoice date, should automatically incur. Formally, the delinquent customer is a customer who for the last three consecutive months did not pay the bills for the services received. The accountant who monitors the account forwards the list of those that are delinquent to the production bureau. The production bureau sends a notice to the customers reminding them that they have to pay their bill over the next 10 days, otherwise they will be disconnected from the network. If even after the 10 days these customers do not pay, orders of disconnection are issued and followed by the actual disconnection action. The next step is to try two more times to get the payment using the cashiers of the company, then notification and last step deferring to Court. After the sentence is given, the execution debt enforcement of the customer will be

implemented. In practice, though, these rules rarely get enforced. Urban often does not try to get late payment fees from the customers since it is difficult enough to get them pay initial amount and too troublesome to sue them.

If commercial entities do not pay, it is relatively easy to sue them or to stop delivery of heat. With residential customers, Urban enforcement options are severely limited by the fact that, according to the Urban management, Residential Associations are not legal entities under that can be sued. Also, there is no technical possibility to cut off just non-paying (but not all) households in the apartment building, and there are serious social and moral dilemmas with imposing on all households the collective punishment of heat cut off for financial transgressions of just few.

All the above reasons explain persistent difficulties with collection. It is very hard to estimate the collection rate correctly, since it depends on the season and many other factors. The best available estimation of the situation with collection can be done on the basis of the data for late payments in the last two month of years 1998 – 2000 (Figure 3-11) and on the analysis of accounts receivable that is done below (see Figure 3-15 and related discussion).

Figure 3-11. History of Late Payments to Urban
(Total of Bills that are Issued before November 1 and Not Paid by the End of the Year)

<i>Romanian Lei in Thousands</i>	1998	1999	2000
Residential, of which	4,085,897	6,740,206	11,989,046
Apartment building associations	3,998,930	6,607,479	11,726,955
Individual households	86,967	132,727	262,091
All others, of which	3,705,104	3,311,672	2,792,954
Companies, private or mixed ownership	1,874,562	1,365,499	1,960,115
Companies, state ownership (including some budgetary organizations)	1,406,057	1,770,864	821,047
Health organizations	232,141	-	-
Schools	192,344	175,309	11,792
TOTAL	7,791,001	10,051,878	14,782,000

3.5 Financial Factors (Creditworthiness)

Revenues

Operating revenues of Urban increased from ROL 40,279 M in 1998 to ROL 57,244 M in 1999 and ROL 66,343 M in 2000 (Figure 3-12). The growth of revenues reflects the increase of tariffs for heat, and other services caused primarily by very high inflation in Romania and the decline of the purchasing power of Romania Lei (Romanian Lei to US Dollar exchange rates were 10,975, 18,285 and 25,813 at December 31, 1998, 1999 and 2000, respectively). As shown in the section 3.2, heat sales in 2000 declined to 147,661 Gcal from 175,089 Gcal in 1999 and 193,199 Gcal in 1998 (total drop of 23.5%). Revenues in US Dollar equivalent reflected this trend and decreased from US\$ 3.7 M in 1998 to 2.6 M in 2000, or about 30%.

It is important to note that although the portion of subsidies from the state and local budgets in the total operating revenues decreased from 10.6% in 1998 to 4.0% in 2000, heat and DHW sales provided from 54.0% to 60.8% of total operating revenues – most significant contribution among all the activities. Water supply sales brought 21.2% - 29.4%, sewage collection 5.5% - 8.3%, wastewater treatment 3.2% - 5.8%, and other activities 2.4% - 9.6%.

Costs and Expenses

Although operating revenues decreased in US Dollar equivalent in 2000 by 17.9%, operating expenses decreased by 18.2% during the same period of time. According to Urban Income Statements the heat and DHW, as well as all other major activities, were profitable in last three year. However, since Urban had substantial unallocated overhead expenses in last two years 1999-2000, the Company had operating losses in the amount of ROL 751 M and ROL 607 M in 1999 and 2000, respectively (Figure 3-12). Nevertheless, since Urban had some other net income from extraordinary items, the Company was profitable in 1998-2000.

Figure 3-12. Urban Income Statements for 1998-2000

	1998			1999			2000		
	('000 ROL)	(US \$)	(%)	('000 ROL)	(US \$)	(%)	('000 ROL)	(US \$)	(%)
Operating Revenues									
District heating and DHW									
Revenues excluding subsidies	17,478,559	\$ 1,592,579	43.4%	27,562,034	\$ 1,507,358	48.1%	36,716,136	\$ 1,422,389	55.3%
Heat subsidies	4,271,884	\$ 389,238	10.6%	7,260,132	\$ 397,054	12.7%	2,672,541	\$ 103,535	4.0%
Total revenues from heat and DWH	21,750,443	\$ 1,981,817	54.0%	34,822,166	\$ 1,904,412	60.8%	39,388,677	\$ 1,525,924	59.4%
Heat-unrelated activities									
Water supply	11,846,489	\$ 1,079,407	29.4%	12,417,114	\$ 679,087	21.7%	14,055,236	\$ 544,502	21.2%
Sewage collection	3,358,415	\$ 306,006	8.3%	3,261,753	\$ 178,384	5.7%	3,642,408	\$ 141,108	5.5%
Wastewater treatment	2,352,880	\$ 214,385	5.8%	1,849,519	\$ 101,150	3.2%	2,868,930	\$ 111,143	4.3%
Other	970,424	\$ 88,421	2.4%	4,893,574	\$ 267,628	8.5%	6,388,260	\$ 247,482	9.6%
Total heat-unrelated activities	18,528,208	\$ 1,688,219	46.0%	22,421,960	\$ 1,226,249	39.2%	26,954,834	\$ 1,044,235	40.6%
Other Revenues	-	\$ -	0.0%	-	\$ -	0.0%	-	\$ -	0.0%
Total Operating Revenues	40,278,651	\$ 3,670,037	100.0%	57,244,126	\$ 3,130,660	100.0%	66,343,511	\$ 2,570,159	100.0%
Operating Expenses									
District heating and DHW	21,003,720	\$ 1,913,779	53.1%	32,607,609	\$ 1,783,298	56.2%	37,360,968	\$ 1,447,370	55.8%
Heat-unrelated activities									
Water supply	10,444,296	\$ 951,644	26.4%	12,050,753	\$ 659,051	20.8%	11,198,269	\$ 433,823	16.7%
Sewage collection	2,697,533	\$ 245,789	6.8%	2,858,251	\$ 156,317	4.9%	3,528,696	\$ 136,702	5.3%
Wastewater treatment	816,172	\$ 74,366	2.1%	1,507,759	\$ 82,459	2.6%	1,681,624	\$ 65,146	2.5%
Other	1,204,383	\$ 109,739	3.0%	3,242,741	\$ 177,344	5.6%	6,595,457	\$ 255,509	9.9%
Total heat-unrelated activities	15,162,384	\$ 1,381,538	38.4%	19,659,504	\$ 1,075,171	33.9%	23,004,046	\$ 891,181	34.4%
Other Expenses (Overhead)	3,363,977	\$ 306,513	8.5%	5,728,356	\$ 521,946	9.9%	6,585,851	\$ 600,078	9.8%
Total Operating Expenses	39,530,081	\$ 3,601,830	100.0%	57,995,469	\$ 3,171,751	100.0%	66,950,865	\$ 2,593,688	100.0%
Operating Income									
District heating and DHW	746,723	\$ 68,039		2,214,557	\$ 121,113		2,027,709	\$ 78,554	
Heat-unrelated activities									
Water supply	1,402,193	\$ 127,762		366,361	\$ 20,036		2,856,967	\$ 110,679	
Sewage collection	660,882	\$ 60,217		403,502	\$ 22,067		113,712	\$ 4,405	
Wastewater treatment	1,536,708	\$ 140,019		341,760	\$ 18,691		1,187,306	\$ 45,996	
Other	(233,959)	\$ (21,317)		1,650,833	\$ 90,283		(207,197)	\$ (8,027)	
Total heat-unrelated activities	3,365,824	\$ 306,681		2,762,456	\$ 151,078		3,950,788	\$ 153,054	
Other Operating Income	(3,363,977)	\$ (306,513)		(5,728,356)	\$ (521,946)		(6,585,851)	\$ (600,078)	
Total Operating Income	748,570	\$ 68,207		(751,343)	\$ (41,091)		(607,354)	\$ (23,529)	
Other Income and Deductions									
Income from Financial Activity, net	(326,739)	\$ (29,771)		(392,533)	\$ (21,467)		(324,412)	\$ (12,568)	
Other Income, net	436,101	\$ 39,736		1,591,150	\$ 87,019		2,422,281	\$ 93,840	
Total Income, Net	109,362	\$ 9,965		1,198,617	\$ 65,552		2,097,869	\$ 81,272	
Income Before Income Tax	857,932	\$ 78,171		447,274	\$ 24,461		1,490,515	\$ 57,743	
Non-deductible Expenses	392,052	\$ 35,722		234,549	\$ 12,827		139,487	\$ 5,404	
Tax Credits	375,281	\$ 34,194		203,955	\$ 11,154		82,010	\$ 3,177	
Total Taxable Income	857,932	\$ 78,171		447,274	\$ 24,461		1,490,515	\$ 57,743	
Income Tax	332,387	\$ 30,286		181,590	\$ 9,931		386,998	\$ 14,992	
Net Income	525,545	\$ 47,886		265,684	\$ 14,530		1,103,517	\$ 42,750	
<i>Exchange Rate ROL/US\$</i>	<i>10,975 at December 31</i>			<i>18,285 at December 31</i>			<i>25,813 at December 31</i>		

Although in 2000 Urban decreased purchasing heat form Amonil, the cost of the purchased heat was most significant and amounted for 19.7% of the total operating expenses. Since Urban began to generate more heat, expenses for fuel increased from 11.3% in 1999 to 15.2% in 2000 (Figure 3-13).

It is interesting to note that payroll expenses were very substantial and amounted 20.2% in 1998, 19.4% in 1999 and 19.8% in 2000.

Figure 3-13. Disclosure of Urban Operating Expenses for 1998-2000

	1998			1999			2000		
	('000 ROL)	(US \$)	(%)	('000 ROL)	(US \$)	(%)	('000 ROL)	(US \$)	(%)
Operating expenses									
Fuel									
Oil	427,178	\$ 38,923	1.1%	581,553	\$ 31,805	1.0%	900,706	\$ 34,894	1.3%
Natural gas	2,289,700	\$ 208,629	5.8%	5,974,445	\$ 326,740	10.3%	9,248,201	\$ 358,277	13.8%
Total fuel	2,716,878	\$ 247,552	6.9%	6,555,998	\$ 358,545	11.3%	10,148,907	\$ 393,170	15.2%
Thermal energy	9,944,364	\$ 906,092	25.2%	15,494,730	\$ 847,401	26.7%	13,220,000	\$ 512,145	19.7%
Water	5,024,000	\$ 457,768	12.7%	4,901,670	\$ 268,071	8.5%	4,592,700	\$ 177,922	6.9%
Electricity	2,698,674	\$ 245,893	6.8%	3,398,837	\$ 185,881	5.9%	4,290,742	\$ 166,224	6.4%
Materials and suppliers	3,158,469	\$ 287,788	8.0%	4,379,609	\$ 239,519	7.6%	6,901,043	\$ 267,348	10.3%
Outsourced services	3,536,980	\$ 322,276	8.9%	4,025,978	\$ 220,179	6.9%	5,274,338	\$ 204,329	7.9%
Salary	5,963,941	\$ 543,411	15.1%	7,812,513	\$ 427,263	13.5%	9,233,584	\$ 357,711	13.8%
Payroll taxes	2,168,475	\$ 197,583	5.5%	3,397,042	\$ 185,783	5.9%	4,038,535	\$ 156,454	6.0%
Other taxes	92,790	\$ 8,455	0.2%	128,954	\$ 7,052	0.2%	235,267	\$ 9,114	0.4%
Royalties, rents, concessions	46,178	\$ 4,208	0.1%	1,096,148	\$ 59,948	1.9%	1,476,990	\$ 57,219	2.2%
Depreciation	569,364	\$ 51,878	1.4%	444,788	\$ 24,325	0.8%	309,655	\$ 11,996	0.5%
Other	245,991	\$ 22,414	0.6%	630,846	\$ 34,501	1.1%	643,253	\$ 24,920	1.0%
Unallocated overhead expenses	3,363,977	\$ 306,513	8.5%	5,728,356	\$ 313,282	9.9%	6,585,851	\$ 255,137	9.8%
Total operating expenses	39,530,081	\$ 3,601,830	100.0%	57,995,469	\$ 3,171,751	100.0%	66,950,865	\$ 2,593,688	100.0%
	<i>10,975 at December 31</i>			<i>18,285 at December 31</i>			<i>25,813 at December 31</i>		

The breakdown of operating expenses by activities (Figure 3-14) shows in general the cost structure of Urban. It might have a slightly different structure due to a proper reallocation of considerable unallocated overhead expenses and some other items.

Figure 3-14. Disclosure of Operating Expenses by Activities for 1998-2000

	1998			1999			2000		
	('000 ROL)	(US \$)	(%)	('000 ROL)	(US \$)	(%)	('000 ROL)	(US \$)	(%)
District heating and DHW									
Fuel									
Oil	250,436	\$ 234	1.2%	291,088	\$ 268	0.9%	457,526	\$ 401	1.2%
Natural gas	2,289,700	\$ 2,144	10.9%	5,974,445	\$ 5,498	18.3%	9,248,201	\$ 8,106	24.8%
Total fuel	2,540,136	\$ 2,31,447	12.1%	6,265,533	\$ 342,660	19.2%	9,705,727	\$ 376,002	26.0%
Thermal energy	9,944,364	\$ 906,092	47.3%	15,494,730	\$ 847,401	47.5%	13,220,000	\$ 512,145	35.4%
Electricity	685,602	\$ 62,469	3.3%	1,181,314	\$ 64,606	3.6%	1,656,061	\$ 64,156	4.4%
Materials and supplies	1,689,544	\$ 153,945	8.0%	1,833,541	\$ 100,276	5.6%	1,798,101	\$ 69,659	4.8%
Outsourced services	1,692,209	\$ 154,188	8.1%	1,661,853	\$ 90,886	5.1%	3,240,373	\$ 125,533	8.7%
Salary	3,032,202	\$ 276,283	14.4%	3,824,637	\$ 209,168	11.7%	4,591,414	\$ 177,872	12.3%
Payroll taxes	1,090,820	\$ 99,391	5.2%	1,631,814	\$ 89,243	5.0%	1,967,930	\$ 76,238	5.3%
Other taxes	3,440	\$ 313	0.0%	21,305	\$ 1,165	0.1%	31,276	\$ 1,212	0.1%
Royalties, rents, concessions	21,573	\$ 1,966	0.1%	602,144	\$ 32,931	1.8%	979,380	\$ 37,941	2.6%
Depreciation	303,830	\$ 27,684	1.4%	90,738	\$ 4,962	0.3%	170,706	\$ 6,613	0.5%
Total district heating and DHW	21,003,720	\$ 1,913,779	100.0%	32,607,609	\$ 1,783,298	100.0%	37,360,968	\$ 1,447,370	100.0%
Water supply									
Fuel	109,990	\$ 10,022	1.1%	224,023	\$ 12,252	1.9%	258,322	\$ 10,007	2.3%
Water	5,024,000	\$ 457,768	48.1%	4,901,670	\$ 268,071	40.7%	4,592,700	\$ 177,922	41.0%
Electricity	1,068,072	\$ 97,319	10.2%	1,086,579	\$ 59,425	9.0%	1,140,879	\$ 44,198	10.2%
Materials and supplies	924,901	\$ 84,273	8.9%	1,633,632	\$ 89,343	13.6%	1,304,240	\$ 50,526	11.6%
Outsourced services	901,736	\$ 82,163	8.6%	970,469	\$ 53,075	8.1%	621,405	\$ 24,073	5.5%
Salary	1,640,009	\$ 149,431	15.7%	1,949,975	\$ 106,643	16.2%	2,009,343	\$ 77,842	17.9%
Payroll taxes	556,948	\$ 50,747	5.3%	831,975	\$ 45,500	6.9%	861,225	\$ 33,364	7.7%
Other taxes	25,320	\$ 2,307	0.2%	39,017	\$ 2,134	0.3%	14,990	\$ 581	0.1%
Royalties, rents, concessions	11,496	\$ 1,047	0.1%	309,987	\$ 16,953	1.0%	315,225	\$ 12,212	0.8%
Depreciation	181,824	\$ 16,567	1.7%	103,426	\$ 5,656	0.9%	79,940	\$ 3,097	0.7%
Total water supply	10,444,296	\$ 951,644	100.0%	12,050,753	\$ 659,051	100.0%	11,198,269	\$ 433,823	100.0%
Sewage									
Fuel	42,667	\$ 3,888	1.6%	34,906	\$ 1,909	1.2%	155,259	\$ 6,015	4.4%
Electricity	824,791	\$ 75,152	30.6%	966,432	\$ 52,854	33.8%	1,201,370	\$ 46,541	34.0%
Materials and supplies	138,593	\$ 12,628	5.1%	136,508	\$ 7,466	4.8%	213,941	\$ 8,288	6.1%
Outsourced services	590,823	\$ 53,834	21.9%	117,662	\$ 6,435	4.1%	194,457	\$ 7,533	5.5%
Salary	740,654	\$ 67,486	27.5%	959,462	\$ 52,473	33.6%	1,151,308	\$ 44,602	32.6%
Payroll taxes	281,381	\$ 25,638	10.4%	409,364	\$ 22,388	14.3%	493,462	\$ 19,117	14.0%
Other taxes	2,010	\$ 183	0.1%	3,739	\$ 204	0.1%	4,484	\$ 174	0.1%
Royalties, rents, concessions	7,596	\$ 692	0.0%	112,706	\$ 6,164	0.3%	110,908	\$ 4,297	0.3%
Depreciation	69,018	\$ 6,289	2.6%	117,472	\$ 6,425	4.1%	3,507	\$ 136	0.1%
Total sewage	2,697,533	\$ 245,789	100.0%	2,858,251	\$ 156,317	100.0%	3,528,696	\$ 136,702	100.0%
Water treatment									
Fuel	1,892	\$ 172	0.2%	16,241	\$ 888	1.1%	3,784	\$ 147	0.2%
Electricity	117,973	\$ 10,749	14.5%	143,801	\$ 7,864	9.5%	245,219	\$ 9,500	14.6%
Materials and supplies	55,523	\$ 5,059	6.8%	64,560	\$ 3,531	4.3%	169,783	\$ 6,577	10.1%
Outsourced services	245,012	\$ 22,325	30.0%	313,471	\$ 17,144	20.8%	124,799	\$ 4,835	7.4%
Salary	280,414	\$ 25,550	34.4%	594,265	\$ 32,500	39.4%	694,318	\$ 26,898	41.3%
Payroll taxes	97,069	\$ 8,845	11.9%	287,291	\$ 15,712	19.1%	353,191	\$ 13,683	21.0%
Other taxes	6,932	\$ 632	0.8%	10,446	\$ 571	0.7%	11,215	\$ 434	0.7%
Royalties, rents, concessions	5,513	\$ 502	0.0%	71,311	\$ 3,900	0.2%	71,337	\$ 2,764	0.2%
Depreciation	5,844	\$ 532	0.7%	6,373	\$ 349	0.4%	7,978	\$ 309	0.5%
Total water treatment	816,172	\$ 74,366	100.0%	1,507,759	\$ 82,459	100.0%	1,681,624	\$ 65,146	100.0%
Other activities									
Fuel	22,193	\$ 2,022	1.8%	15,295	\$ 836	0.5%	25,815	\$ 1,000	0.4%
Electricity	2,236	\$ 204	0.2%	20,711	\$ 1,133	0.6%	47,213	\$ 1,829	0.7%
Materials and supplies	349,908	\$ 31,882	29.1%	711,368	\$ 38,904	21.9%	3,414,978	\$ 132,297	51.8%
Outsourced services	107,200	\$ 9,768	8.9%	962,523	\$ 52,640	29.7%	1,093,304	\$ 42,355	16.6%
Salary	270,662	\$ 24,662	22.5%	484,174	\$ 26,479	14.9%	787,201	\$ 30,496	11.9%
Payroll taxes	142,257	\$ 12,962	11.8%	236,598	\$ 12,939	7.3%	362,727	\$ 14,052	5.5%
Other taxes	55,088	\$ 5,019	4.6%	54,447	\$ 2,978	1.7%	173,302	\$ 6,714	2.6%
Royalties, rents, concessions	-	\$ -	0.0%	-	\$ -	0.0%	140	\$ 5	0.0%
Depreciation	8,848	\$ 806	0.7%	126,779	\$ 6,933	3.9%	47,524	\$ 1,841	0.7%
Other	245,991	\$ 22,414	20.4%	630,846	\$ 34,501	19.5%	643,253	\$ 24,920	9.8%
Total other activities	1,204,383	\$ 109,739	100.0%	3,242,741	\$ 177,344	100.0%	6,595,457	\$ 255,509	100.0%
10,975 at December 31 18,285 at December 31 25,813 at December 31									

Accounts Receivable

Urban accounts receivable increased from ROL 20,507 K in 1998 to ROL 29,624 K in 1999, and ROL 43,053 K (Figure 3-15). It is important to note that substantial growth of receivables took place as a result of the Urban activity for the construction and selling apartments to the population at the Municipality request.

Long-term receivables in the amount ROL 6,039 M in 1998, ROL 5,974 M in 1999, and ROL 13,315 M in 2000 reflect the Urban involvement in this activity. The Municipality provided funds for the construction works shown on the Other Funds account of Shareholders' Equity and the Tangible Assets in Progress account of Assets. When the construction of buildings was completed, Urban sold apartments to the population under the agreement with buyers to pay installment fees to repay the apartment cost in fifteen years. Therefore, utilizing municipal funds Urban provided mortgage loan to the population. Urban recognized their debts to the Municipality for the unpaid balance of the sold apartments as Unearned Revenue, and long-term debts (mortgages) of apartment owners – as Accounts Receivable.

This activity was undertaken also before 1989 and Urban had to continue it under Decree 61/1989 on selling houses through special economic entities. Urban was responsible to develop the necessary documentation that is the basis of the selling action and earned 1% of the value of each apartment for these transactions and 0.25% of the interest rate for managing mortgage loans.

The population was also a principal debtor for major Urban's activities. The portion of population receivable increased from 42.1 in 1998 to 54.6% in 1999 and 55.6% in 2000. However, debt portions of budget organizations and other legal entities decreased by two times for the same period of time.

Intangible and Tangible Assets

According to the Urban financial management interpretation of the Ministry of Finance guidelines for depreciation of intangible and tangible assets municipal fixed assets operated under the concession agreement with the Municipality were recognized as intangible assets in the Balance Sheet. These assets amounted ROL 33,812 M as of December 31, 2000 (figure 3-16). Urban own tangible assets amounted 21.5% of these municipally owned assets.

Figure 3-15. Accounts Receivable in 1998-2000

		less				Total	Share of Total Payables (%)
		then 30 days	over 30 days	over 90 days	over 1 year		
December 31, 1998							
Population	'000 ROL	3,430,429	2,249,708	2,681,678	274,219	8,636,034	42.1%
Budget organizations	'000 ROL	673,977	258,316	325,480	12,580	1,270,353	6.2%
Other legal entities	'000 ROL	686,423	1,178,169	981,262	1,715,782	4,561,636	22.2%
Mortgagees	'000 ROL	-	-	-	6,039,406	6,039,406	29.4%
Total	'000 ROL	4,790,829	3,686,193	3,988,420	8,041,987	20,507,429	100.0%
		23.4%	18.0%	19.4%	39.2%	100.0%	
	(US\$)	\$ 436,522	\$ 335,872	\$ 363,410	\$ 732,755	\$ 1,868,558	
<i>Exchange Rate ROL/US\$</i>					<i>10,975 at December 31</i>		
December 31, 1999							
Population	'000 ROL	6,901,457	5,019,326	3,232,198	1,008,008	16,160,989	54.6%
Budget organizations	'000 ROL	955,055	96,282	155,613	10,905	1,217,855	4.1%
Other legal entities	'000 ROL	2,559,861	1,167,431	604,549	1,940,050	6,271,891	21.2%
Mortgagees	'000 ROL	-	-	-	5,973,937	5,973,937	20.2%
Total	'000 ROL	10,416,373	6,283,039	3,992,360	8,932,900	29,624,672	100.0%
		35.2%	21.2%	13.5%	30.2%	100.0%	
	(US\$)	\$ 569,668	\$ 343,617	\$ 218,341	\$ 488,537	\$ 1,620,163	
<i>Exchange Rate ROL/US\$</i>					<i>18,285 at December 31</i>		
December 31, 2000							
Population	'000 ROL	8,845,556	6,035,465	6,765,675	2,223,371	23,870,067	55.5%
Budget organizations	'000 ROL	1,002,746	160,934	74,806	-	1,238,486	2.9%
Other legal entities	'000 ROL	1,128,310	1,657,967	352,653	1,465,495	4,604,425	10.7%
Mortgagees	'000 ROL	-	-	-	13,315,229	13,315,229	30.9%
Total	'000 ROL	10,976,612	7,854,366	7,193,134	17,004,095	43,028,207	100.0%
		25.5%	18.3%	16.7%	39.5%	100.0%	
	(US\$)	\$ 425,236	\$ 304,279	\$ 278,663	\$ 658,742	\$ 1,666,920	
<i>Exchange Rate ROL/US\$</i>					<i>25,813 at December 31</i>		

Figure 3-16. Balance Sheets in 1998-2000. Assets

	1998		1999		2000	
	('000 ROL)	(US \$)	('000 ROL)	(US \$)	('000 ROL)	(US \$)
ASSETS						
Intangible Assets						
Research and development	2,606	\$ 237	50	3	-	-
Other	4,562	\$ 416	23,274,207	1,272,858	33,811,874	1,309,878
Total intangible assets	7,168	\$ 653	23,274,257	1,272,861	33,811,874	1,309,878
Tangible Assets						
Lands						
Lands	-	-	-	\$ -	-	\$ -
Buildings						
Heat and DHW	4,096,394	\$ 373,248	1,375,246	\$ 75,212	2,916,142	\$ 112,972
Water	3,474,054	\$ 316,543	8,819	\$ 482	347,207	\$ 13,451
Sewage	2,544,672	\$ 231,861	29,150	\$ 1,594	28,439	\$ 1,102
Wastewater treatment	2,231,865	\$ 203,359	-	\$ -	2,942,285	\$ 113,985
Other	308,177	\$ 28,080	241,029	\$ 13,182	231,237	\$ 8,958
Total buildings	12,655,162	\$ 1,153,090	1,654,244	\$ 90,470	6,465,310	\$ 250,467
Special buildings						
Heat and DHW	298,633	\$ 27,210	158,300	\$ 8,657	146,257	\$ 5,666
Water	694,321	\$ 63,264	198,444	\$ 10,853	161,952	\$ 6,274
Sewage	182,770	\$ 16,653	20,717	\$ 1,133	6,417	\$ 249
Wastewater treatment	12,265	\$ 1,118	4,333	\$ 237	3,080	\$ 119
Other	52,685	\$ 4,800	55,372	\$ 3,028	114,379	\$ 4,431
Total special buildings	1,240,674	\$ 113,045	437,166	\$ 23,908	432,085	\$ 16,739
Transportation means						
Heat and DHW	22,359	\$ 2,037	6,934	\$ 379	5,078	\$ 197
Water	38,497	\$ 3,508	449	\$ 25	13,330	\$ 516
Sewage	9,325	\$ 850	4,589	\$ 251	6,510	\$ 252
Wastewater treatment	-	\$ -	-	\$ -	-	\$ -
Other	42,248	\$ 3,849	32,367	\$ 1,770	129,182	\$ 5,005
Total transportation means	112,429	\$ 10,244	44,339	\$ 2,425	154,100	\$ 5,970
Other tangible assets						
Heat and DHW	314,381	\$ 28,645	68,922	\$ 3,769	45,273	\$ 1,754
Water	40,356	\$ 3,677	25,215	\$ 1,379	15,548	\$ 602
Sewage	4,518	\$ 412	1,889	\$ 103	1,889	\$ 73
Wastewater treatment	4,152	\$ 378	3,832	\$ 210	2,589	\$ 100
Other	99,499	\$ 9,066	111,447	\$ 6,095	125,082	\$ 4,846
Total tangible assets in progress	462,906	\$ 42,178	211,305	\$ 11,556	190,381	\$ 7,375
Tangible assets in progress						
Heat and DHW	875,101	\$ 79,736	26,340	\$ 1,441	26,340	\$ 1,020
Water	-	\$ -	-	\$ -	-	\$ -
Sewage	-	\$ -	-	\$ -	-	\$ -
Wastewater treatment	485,809	\$ 44,265	1,044,143	\$ 57,104	-	\$ -
Other	2,871,956	\$ 261,682	5,406,276	\$ 295,667	-	\$ -
Total tangible assets in progress	4,232,866	\$ 385,683	6,476,759	\$ 354,212	26,340	\$ 1,020
Total Tangible Assets	18,704,037	\$ 1,704,240	8,823,813	\$ 482,571	7,268,216	\$ 281,572
Current Assets						
Inventories						
Stocks of raw material, consumables	798,398	\$ 72,747	795,603	\$ 43,511	944,016	\$ 36,571
Goods	-	\$ -	1,074	\$ 59	-	\$ -
Total inventories	798,398	\$ 72,747	796,677	\$ 43,570	944,016	\$ 36,571
Advance payments to suppliers	15,662	\$ 1,427	-	\$ -	20,698	\$ 802
Accounts receivable						
Heat and DHW	7,085,970	\$ 645,646	13,240,570	\$ 724,122	17,247,662	\$ 668,177
Water supply	4,772,184	\$ 434,823	6,010,273	\$ 328,700	6,985,303	\$ 270,612
Sewage	1,373,810	\$ 125,176	1,584,140	\$ 86,636	1,813,978	\$ 70,274
Wastewater treatment	882,131	\$ 80,376	985,620	\$ 53,903	1,011,070	\$ 39,169
Other	6,393,334	\$ 582,536	7,804,069	\$ 426,802	15,994,564	\$ 619,632
Total accounts receivable	20,507,429	\$ 1,868,558	29,624,672	\$ 1,620,163	43,052,577	\$ 1,667,864
Bad debts and disputes	4,685	\$ 427	4,685	\$ 256	4,685	\$ 181
Other receivables						
Credit of VAT	1,434,126	\$ 130,672	6,023,686	\$ 329,433	3,859,568	\$ 149,520
Subsidies	1,464,881	\$ 133,474	-	\$ -	212,582	\$ 8,235
Debts of other budget entities	-	\$ -	610,945	\$ 33,412	1,355,900	\$ 52,528
Other debtors	11,129	\$ 1,014	12,446	\$ 681	956	\$ 37
Total other receivables	2,910,136	\$ 265,160	6,647,077	\$ 363,526	5,429,006	\$ 210,321
Cash in bank, ROL account	264,829	\$ 24,130	1,009,359	\$ 55,201	1,430,202	\$ 55,406
Cash in bank, foreign currency account	-	\$ -	-	\$ -	311	\$ 12
Petty cash	38,316	\$ 3,491	79,457	\$ 4,345	10,440	\$ 404
Other values	7,814	\$ 712	29,146	\$ 1,594	7,663	\$ 297
Total Current Assets	24,547,269	\$ 2,236,653	38,191,073	\$ 2,088,656	50,899,598	\$ 1,971,859
Prepaid expenses	62,493	\$ 5,694	9,522	\$ 521	-	\$ -
Total Assets	43,320,967	\$ 3,947,241	70,298,665	\$ 3,844,608	91,979,688	\$ 3,563,309
<i>Exchange Rate ROL/US\$</i>						
	<i>10,975 at December 31</i>		<i>18,285 at December 31</i>		<i>25,813 at December 31</i>	

Figure 3-17. Balance Sheets in 1998-2000. Liabilities

	1998		1999		2000	
	('000 ROL)	(US \$)	('000 ROL)	(US \$)	('000 ROL)	(US \$)
LIABILITIES AND SHAREHOLDER'S EQUITY						
Shareholder's Equity						
Paid-in capital	1,095,146	\$ 99,786	1,906,375	\$ 104,259	1,906,375	\$ 73,853
Municipal paid-in capital	13,504,794	\$ 1,230,505	-	\$ -	-	\$ -
Reserves	106,504	\$ 9,704	128,868	\$ 7,048	203,394	\$ 7,880
Profit	525,545	\$ 47,886	265,684	\$ 14,530	1,103,517	\$ 42,750
Loss	-	\$ -	-	\$ -	-	\$ -
Profit distribution	525,545	\$ 47,886	265,684	\$ 14,530	1,103,517	\$ 42,750
Other funds	3,449,674	\$ 314,321	5,596,929	\$ 306,094	784,385	\$ 30,387
Subsidies for investments	-	\$ -	-	\$ -	-	\$ -
Total Shareholder's Equity	18,156,118	\$ 1,654,316	7,632,172	\$ 417,401	2,894,154	\$ 112,120
Long-Term and Short-Term Debts						
Current Liabilities						
Short term bank loans	479,202	\$ 43,663	21,057	\$ 1,152	225,016	\$ 8,717
Other loans and similar debts	-	\$ -	23,284,479	\$ 1,273,420	33,859,494	\$ 1,311,723
Interests payable	-	\$ -	-	\$ -	-	\$ -
Accounts payable						
Heat and DHW						
Heat supplier Amonil	10,516,712	\$ 958,243	19,350,399	\$ 1,058,266	24,479,298	\$ 948,332
Other suppliers	550,957	\$ 50,201	1,083,671	\$ 59,266	983,514	\$ 38,101
Total heat and DHW	11,067,669	\$ 1,008,444	20,434,070	\$ 1,117,532	25,462,812	\$ 986,434
Water supply	3,505,570	\$ 319,414	6,450,133	\$ 352,755	8,086,703	\$ 313,280
Sewage	-	\$ -	-	\$ -	-	\$ -
Wastewater treatment	-	\$ -	-	\$ -	-	\$ -
Other	2,376,970	\$ 216,580	4,371,883	\$ 239,097	5,385,922	\$ 208,652
Total accounts payable	16,950,209	\$ 1,544,438	31,256,086	\$ 1,709,384	38,935,437	\$ 1,508,365
Notes payable for fixed assets						
Heat and DHW	189,155	\$ 17,235	57,941	\$ 3,169	161,211	\$ 6,245
Other	67,161	\$ 6,119	-	\$ -	25,406	\$ 984
Total notes payable for fixed assets	256,316	\$ 23,355	57,941	\$ 3,169	186,617	\$ 7,230
Accounts payable - invoices not received	-	\$ -	-	\$ -	7,621	\$ 295
Heat and DHW (economic entities)	-	\$ -	29,010	\$ 1,587	58,131	\$ 2,252
Water supply	-	\$ -	9,600	\$ 525	20,514	\$ 795
Total advance payments	-	\$ -	38,610	\$ 2,112	78,645	\$ 3,047
Personnel and similar accounts	454,708	\$ 41,431	483,951	\$ 26,467	733,310	\$ 28,409
Social security fund	335,848	\$ 30,601	505,854	\$ 27,665	606,114	\$ 23,481
Unemployment fund	52,051	\$ 4,743	62,082	\$ 3,395	77,240	\$ 2,992
Income tax	156,973	\$ 14,303	181,590	\$ 9,931	321,098	\$ 12,439
VAT payable	-	\$ -	-	\$ -	-	\$ -
VAT unexpired	-	\$ -	-	\$ -	-	\$ -
Salaries tax	169,662	\$ 15,459	154,400	\$ 8,444	189,664	\$ 7,348
Subsidies	-	\$ -	445,316	\$ 24,354	-	\$ -
Other taxes and duties	217,731	\$ 19,839	9,733	\$ 532	41,160	\$ 1,595
Special fund	9,590	\$ 874	55,979	\$ 3,061	69,161	\$ 2,679
Other debts to the state budget	20,088	\$ 1,830	-	\$ -	-	\$ -
Intercompany and association transactions	-	\$ -	87,595	\$ 4,791	370,437	\$ 14,351
Other debts	16,206	\$ 1,477	41,023	\$ 2,244	40,236	\$ 1,559
Total Current Liabilities	19,118,584	\$ 1,742,012	56,685,696	\$ 3,100,120	75,741,250	\$ 2,934,229
Unearned revenues	6,046,266	\$ 550,913	5,980,797	\$ 327,088	13,344,284	\$ 516,960
Total Liabilities	25,164,850	\$ 2,292,925	62,666,493	\$ 3,427,208	89,085,534	\$ 3,451,189
Total Liabilities and Shareholder's Equity	43,320,968	\$ 3,947,241	70,298,665	\$ 3,844,608	91,979,688	\$ 3,563,309
<i>Exchange Rate ROL/US\$</i>	<i>10,975 at December 31</i>		<i>18,285 at December 31</i>		<i>25,813 at December 31</i>	

Long-Term and Short-Term Debts

Urban did not have long-term and short-term debts in last three years. However, in 1998 - 2000 the Company borrowed for increasing working capital, and its short-term debts amounted ROM 479 M, 21 M and 225 M at December 31, 1998, 1999 and 2000, respectively.

According to the Urban financial management, amounts of ROL 23,284 M and 33,859 M at December 31, 1999 and 2000, correspondingly, reflects Urban liabilities to the Municipality regarding the concession agreement for the operation of municipally owned assets (Figure 3-17).

It was noted above that the Municipality funded Urban for construction apartment buildings for the population, and Urban provided mortgage loans to apartment buyers. Urban recognized their debts to the Municipality for the unpaid balance of the sold apartments as Unearned Revenues, amounted ROL 6.046 M, ROL 5,981 M and ROL 13,344 M in 1998, 1999 and 2000, correspondingly.

Accounts Payable

Increase of accounts receivables in last three year lead to the growth of accounts payable from ROL 31,314 M on December 31, 1999 and to ROL 39,130 M on December 31, 2000 or by 25% (Figure 3-18). However, total payables in US Dollar equivalent decreased by 11.5%.

Although payables to Amonil slightly decreased in 2000 from 87.8 to 86.5%, Amonil is a principal creditor, and debts over one year increased from 2.9% to 29.2% of the total payables to this heat supplier.

The slight growth of debts to Romgas from 7.6% to 9.8% in 2000 correlates with the Urban increase of own heat generation. It is important to note that 70% of the total payables to Romgas do not exceed 30%, and other debts do not exceed 90 days. Payables to SC Electrica SA are not substantial, and in addition decreased from 3.5% to 2.8% at the same period of time.

Figure 3-18. Accounts Payable 1998-2000

		less than 30 days	over 30 days	over 90 days	over 1 year	Total	Share of Total Payables (%)
December 31, 1998							
SC - Amonil	'000 ROL	2,616,747	2,641,140	6,957,991	-	12,215,878	71.0%
Electrica SA	'000 ROL	292,713	258,244	-	-	550,957	3.2%
Romgaz	'000 ROL	1,015,040	419,037	-	-	1,434,077	8.3%
Other suppliers	'000 ROL	328,262	850,396	1,826,261	693	3,005,612	17.5%
Total	'000 ROL	4,252,762	4,168,817	8,784,252	693	17,206,524	100.0%
		24.7%	24.2%	51.1%	0.0%	100.0%	
	(US\$)	\$ 387,495	\$ 379,847	\$ 800,387	\$ 63	\$ 1,567,793	
<i>Exchange Rate ROL/US\$</i>				<i>10,975 at December 31</i>			
December 31, 1999							
SC - Amonil	'000 ROL	3,255,066	6,224,887	17,115,756	894,552	27,490,261	87.8%
Electrica SA	'000 ROL	1,083,671	-	-	-	1,083,671	3.5%
Romgaz	'000 ROL	2,371,053	-	-	-	2,371,053	7.6%
Other suppliers	'000 ROL	369,042	-	-	-	369,042	1.2%
Total	'000 ROL	7,078,832	6,224,887	17,115,756	894,552	31,314,027	100.0%
		22.6%	19.9%	54.7%	2.9%	100.0%	
	(US\$)	\$ 387,139	\$ 340,437	\$ 936,054	\$ 48,923	\$ 1,712,553	
<i>Exchange Rate ROL/US\$</i>				<i>18,285 at December 31</i>			
December 31, 2000							
SC - Amonil	'000 ROL	3,171,045	4,633,952	14,609,133	11,431,245	33,845,375	86.5%
Electrica SA	'000 ROL	871,204	-	205,351	-	1,076,555	2.8%
Romgaz	'000 ROL	2,726,559	1,096,661	-	-	3,823,220	9.8%
Other suppliers	'000 ROL	384,525	-	-	-	384,525	1.0%
Total	'000 ROL	7,153,333	5,730,613	14,814,484	11,431,245	39,129,675	100.0%
		18.3%	14.6%	37.9%	29.2%	100.0%	
	(US\$)	\$ 277,121	\$ 222,005	\$ 573,916	\$ 442,848	\$ 1,515,890	
<i>Exchange Rate ROL/US\$</i>				<i>25,813 at December 31</i>			

4 Technical Background and Description of the Project

4.1 Project Goals

Two main goals are pursued by implementation of proposed project. The first one is to improve the overall operational efficiency of municipal heating in the city of Slobozia. The second goal is to improve reliability of municipal heat supply. It might be done via reduction of city dependence on non-reliable heat supply from industrial enterprise Amonil, which is located quite far from the city (at 8 km).

4.2 General System Conditions

The city of Slobozia is located in Southeastern part of Romania, approximately 120 km to the East from Bucharest. Slobozia is the administrative center of Ialomita county. The climate for this location is rather mild; according to the local meteorological standard (SR 4839/1997) the city belongs to Climate Zone II, with a design outdoor air temperature of -15 degrees centigrade (°C). The monthly average temperature in the city for the past three years is given below.

Figure 4-1. Monthly Average Temperature for Slobozia

	Jan	Febr	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1997	-3.5	0.4	4.5	7	18.5	21.3	22.2	20.4	15	9.9	6.1	0.6
1998	0.8	1.8	4.2	14.2	16.8	22	23.7	23.5	16.5	12	2.9	-4.6
1999	0.1	1.2	6.6	12.1	15.9	22.4	25	23	18.4	11.8	5.1	2.3
2000	-5	2.2	5.4	13.6	17.7	21.5	25	24.2	16.9	11.5	9	3.3

Development of district heating system in Slobozia was initiated in seventies with the construction of five local networks at northern part of the city. Each of these systems had the own boiler house (BH), equipped with liquid-fuel-fired boilers. Later in the eighties system's the development continued, and main district heating system had been created. Chemical enterprise Amonil became heat source for the main system. This enterprise is located in 7 km to Southeast from the city, and delivers heat via primary transmission line (2 pipes of 700 mm in diameter each) to 11 central heating substations (CHSS). The remaining regions of the city had been connected to mentioned system. Later initially built five BH had been interconnected with main network, with the purpose of domestic hot water supply during non-heating seasons.

Very soon after the introduction of supply from Amonil, many customers started experiencing non-adequate heat supply. It was attributed to non-sufficient heat capacity of the source. In order to solve this problem, boilers had been installed inside 6 CHSS to secure and enhance heat supply during wintertime. These 6 winter BHs accepted all heat load of appropriate CHSS, by such mean making entire heat from Amonil available for users connected to remaining 5 CHSS. Nevertheless, even with such arrangement some users, especially at the end of lengthy network still were not satisfied with quality of the service. It leads to the trend between the users of disconnection from Amonil DH system and installation of own individual BHs. Nine such BHs, each of them serving one or two buildings had been erected recently.

Municipal public service utility S.C. Urban S.A. is in charge of operation of all mentioned systems, including 7 km of primary transmission line. It pays to Amonil for purchased heat according to heat

Generation Side Conditions

Main DH system from Amonil

Long-term contract for heat supply between Amonil and the Municipality never existed, but it was always made on one-year basis. Amonil has two heat sources supplying DH to the Municipality:

- The first is dedicated gas-fired boilers, with the total installed capacity of 25 Gcal/h. Now these boilers are worn-out, their efficiency is assessed as 56%. They suppose to supply hot water under the temperature graph of 105°C/65°C, but due to mention worn-out these boilers can't maintain such temperatures.
- The second heat source comes from the recovery in process cooling (Kellogg process). The temperature of the heating from this source is 105°C/65°C.

Due the presence of two very different sources of heat generation, there are also two approved tariffs on the heat supplied from Amonil. Namely they are so-called "winter and summer tariffs", but more proper names should be heating and non-heating season tariffs. They were established at the level of commercial heat meter located at Amonil gates:

- 259,420 ROL/Gcal or US\$ 9.98/Gcal¹ for heating season and
- 126,140 ROL/Gcal or US\$ 4.85/Gcal for non-heating one.

The tariff for heating season reflects heat cost from the mix of heat generation at heat-only-boilers and with heat recovery; as for non-heating season it is pure heat recovery.

Urban adds to these tariffs 229,670 ROL/Gcal before they sold heat to customers, which reflects extremely high cost of transmission and distribution.

Due to absence of long-term contract for heat supply it is impossible to say how much heat can be delivered to DH system from Amonil heat sources. According to provided data Amonil had around 30 Gcal/h of installed capacity available for heat supply to the city; it doesn't include the number of boilers designated for steam and heat generation for the own process needs. The main problem for municipal heating is that mentioned enterprise in no way can supply more than 20 Gcal/h in a time when heat supply is mostly needed, i.e. under coldest outdoors temperatures. Significant portion of mentioned 30 Gcal/h come from heat recovery installation in process cooling, but processes cooling is not needed during cold wintertime. Thus, designated only old heat-only-boilers supply DH to the city in the wintertime.

Furthermore, Amonil management stated that even 20 Gcal/h generations in the wintertime is a burden for the enterprise, since by supporting DH supply they are forced to shut down own production facilities. The technical director of Amonil claimed that when outdoors temperatures drop, his enterprise often receives from gas supplying company restrictive order to reduce or discontinue gas consumption for process needs. Such procedure is rather common for many locations in Eastern Europe and FSU countries, where technical limitations exist on gas consumption due certain throughout capacity of gas pipes. The rationale for such procedure is the following: under cold outdoor temperatures uncontrolled residential gas consumption increase, and use of natural gas by municipal boiler houses increase as well. Intensive gas extraction from the network leads to the pressure drop, which initiates emergency interlocking shutdown of the customers. In order to avoid such uncontrolled events, according to established practice industrial enterprises are obligated to reduce gas consumption or to switch to other fuel, if it is possible.

¹ At the rate of exchange of US\$ 1 = ROL 25,994 at January 1, 2001.

As it was already mentioned that inside six CHSS (numbers 3, 11, 12, 16, 17, and 18) new gas-fired boilers had been installed recently for winter operation. Heat capacity of such built-in BH varies between 1.2 Gcal/h and 7.2 Gcal/h matching the maximum winter load, and the total capacity of all winter boilers is 27.3 Gcal/h.

Other DH systems

Besides the main DH network five smaller isolated DH networks are established around 5 central BHs (numbers 3, 4, 8, 14, and 16) with gas-fired boilers. The oldest of them is No. 3 commissioned 28 years ago, and youngest one is No. 14 of 12 years old. The capacity of these boilers varies between 4.4 Gcal/h and 8.8 Gcal/h, and the total capacity of 37.4 Gcal/h. These isolated networks are connected with main DH for DHW supply from Amonil during non-heating seasons.

Local systems from Distributed Boiler Houses

Nine local networks had been established recently in the year 1998. The capacity of distributed BHs (sometimes called Block BHs) feeding mentioned networks varies between 0.3 Gcal/h and 1.05 Gcal/h, with the total of 5.18 Gcal/h. These BHs are built either inside the buildings or at the premises directly adjusting to them, use natural gas, and operate absolutely independently from Amonil.

Transmission and Distribution Conditions

As it was already mentioned primary transmission line between Amonil and Southeastern city's border is about 7 km long and made by 2 pipes of 700 mm in diameter each. This transition line belongs to the Municipality, and operated by Urban. This pipe is laid mostly aboveground, well maintained, and recently re-insulated. The lengths of additional primary transmission networks of lesser diameters between the entry into city's border and to specific CHSS vary depending on their locations. The longest primary network within city's borders is of 2 km of the length, and runs to CHSS#8 at the very West. Maintenance cost of such lengthy primary networks is a heavy burden for the Municipality and Urban. Only for re-insulation of primary network they spent an equivalent of \$US 300,000 during last three years. In addition an equivalent of US\$ 80,000 for pipes replacement and maintenance was spent in the year 2000.

Besides so-called "commercial" heat meter at Amonil gate, all CHSS are equipped with operational heat meters, installed at primary networks next to each CHSS. Comparison of the reading from the commercial heat meter with the sum of the readings from the ones at CHSS shows the heat losses in primary network, which were around 11% in average despite of mentioned significant expenses for the maintenance. For remote CHSS the losses are even higher.

The next member in "heating chain" CHSS are inefficient in operation, due to poor design, equipment worn-out, and sediments' accumulation inside tube-and-shell heat exchangers. This conclusion is drawn from measurements of water temperatures and their distributions in primary and secondary networks. Such measurements showed that under the temperature in primary supply pipe as high as 88°C, the temperature in supply pipe of the secondary loop is not more than 50°C.

There are certain problems with secondary network pipes as well. They include the leakage from underground pipes, laid into non-accessible concrete channels, and also missing thermal isolation. Presently only small theoretical losses are assumed for settlement with users on heat payment. In essence, due to the absence of heat meters at buildings' level most of these losses are passed on heat users.

End-Use Conditions

A comparison of temperatures of space heating water in supply and return pipes next to the buildings indicates that the radiators extract limited heat. According to provided data, under average winter

conditions, a temperature drop between supply and return pipes at user site ranges between 3°C to 7°C. It is almost 4 – times less, as it should be. Poor extraction is caused primary by low temperature of supply water, but also due to clogged radiators by scale and sediment. In the own turn small temperature differential causes over-consumption of power for water pumping. As usually in worst situation are the users at the end of heat pipes, either primary or secondary.

Due to limited capacity of heat sources and high heat losses in networks, DH company are not able simultaneously provide adequate space heating and DHW supplies both during wintertime. In most cases they are trying to maintain as much as possible space heating, but sacrificing DHW supply. The city population is served by DHW two hours in the morning, three-four hours in the afternoon. Nevertheless, as it was already mentioned, space heat supply is also not sufficient.

Conclusions on Existing System Conditions

The overall conclusions about the condition of equipment, the DH Company performance, and the end-user situation for the Slobozia space heating and hot water systems are:

- Most elements of the district heating system (boiler houses, pipe networks, and end-users' internal building systems) deteriorated, in spite of all effort to keep them well maintained, and are in the need of upgrade or replacement.
- Installed capacity at main heat source Amonil is sufficient to provide enough heat to population, but available capacity in the wintertime is lesser than needed.
- Heat supply from Amonil presently is inexpensive at the level of enterprise gate, but not reliable and associated with essential heat losses due remote location from the city.
- Expenses for maintaining lengthy network from Amonil and CHSS became unbearable burden for municipal budget.
- Urban uses SCADA system for monitoring of municipal networks operation, and has reliable real-time information on main parameters of primary network.
- City residents encounter inadequate supply, more or less depending their locations, and with the worst conditions for the user at the end of “pipe”.
- During last heating season residential consumers paid the national reference tariff of (350,000 ROL/Gcal) for heat.
- DH Company receives certain subsidies to recover the difference between operational expenses and national reference tariff. These subsidies achieve 40% from national reference tariff for heat purchased from Amonil in wintertime. They need significantly fewer subsidies for heat generated at own BH, and for heat purchased from Amonil in summer time according to reduced tariff.
- Inefficiencies in heat supply are passed on to consumers, since there is no metering to compute actual heat consumed.
- Upgrade of entire heating system to meet western standards in terms of efficiency and service quality requires an investment that is not affordable for municipal budgets.

4.3 Project Approach

As it was stated in previous chapter an upgrade of entire municipal heating system to meet western standards in efficiency and service quality is not affordable for municipal budget. Nevertheless, as a long-term targets the Municipality hope eventually establish such system. Their proposals include energy efficient measures urgently needed for improvement of reliability in heat supply; in addition these measures should be ones generating best economic benefits. The most crucial issue for the city of Slobozia is the selection between two main energy efficient alternatives, namely:

- Improvements of energy efficiency, accompanied with installation of own capacities with long-term target eventually to withdraw heat purchase from Amonil. Municipal government and local public service utility proposed this alternative, being uncomfortable with heavy dependence on the policy of private enterprise.
- Improvement of energy efficiency without installation of new capacities, presuming that Amonil would be able to continue sell non-expensive heat in a future

Last heating season Amonil supplied DH under the tariffs very reasonable for the Municipality, even taking into account significant heat losses within 7-km pipe between the enterprise and city border. These tariffs had been approved by ANRE under conditions that Amonil supply is made by a mix of heat generated at old gas-fired heat-only-boiler and by heat from heat recovery in process cooling. From the first view it looks rather attractive to continue purchasing inexpensive heat from Amonil, but more detail investigation revealed the following:

- Starting from June 11, 2001 new increased tariffs for natural gas are introduced in Romania. For public service utilities, as well as for industrial users it is established as an equivalent of US\$ 85. Before it was around an equivalent of US\$ 45. Thus fuel share in heat tariff would increase significantly, and heat losses within lengthy line became more costly.
- According to the statement of the Technical Director of privately owned Chemical Plant Amonil, they successfully operated during last years, in spite of increase of transportation cost and other expenses. During that time the main competitors - two remaining similar facilities in Romania were mostly out of operation.
- The Technical Director of Amonil is also stated that company management is planning implementation of measures, targeted at improvement of fertilizer production process. The main equipment and all process would go through renovation, in order to reduce their expenses and eventually increase their competitiveness at local and international markets.
- In his next statement he mentioned that currently heat supply to the city entails financial losses for his enterprise, but they have to provide the service since all 1500 employees of Amonil are residing in Slobozia (himself including). Furthermore, even presently significant portion of residential buildings of the city is underheated, and they are obligated to provide their service until new heat sources in the city became available.

The following conclusions can be drawn from the stated above:

- The absence of long-term contract for heat supply from Amonil is related to uncertainties in Amonil future, but by unwillingness of mentioned enterprise.
- In optimistic for Amonil scenario, i.e. they succeeded with the enterprise upgrade close similar western facilities; all energy would be utilized for process needs. It means no waste heat anymore for external use, and DH could be provided from designated old heat-only-boilers only. Without the share of heat recovery the cost of generation and delivery of DH from remote and old inefficient boilers in no way can compete with local generation at new boilers, installed within residential area and operating in most efficient manner.
- Pessimistic scenario for Amonil means that they didn't succeed in collections of sufficient funds for enterprise upgrade. The contingencies would be the following: their competitors, Romanian and other as well, turned to be more successful. Then Amonil would stay out of operation. It naturally removes the issue of DH supply from Amonil at all.

None of these scenarios looks promising for the Municipality. Under optimistic scenario for Amonil, DH service for the Municipality would be expensive and non-reliable. Under pessimistic for Amonil scenario the city might be left without heat at all. Taking into the account all these circumstances, Electrotek agreed with the proposals of the Municipality and Urban on development of energy efficiency measures, accompanied with installation of own distributed generation. Implementation of such proposals would

lead in long-term future to the independence from Amonil DH service, and to all heat generated within the city’s borders.

The structure of DH network after completion of mentioned long-term program would be the following:

- All 11 CHSS are decommissioned;
- Each of them is substituted for several local BHs servicing few buildings, with BH’s capacities in the range of 0.35 Gcal/h – 1.85 Gcal/h;
- Limitation of the capacity for single BH up to 1.85 Gcal/h would lead to short connections pipes between each BH and served buildings; heat losses in such pipes will be low;
- Each building would be equipped with the own individual heating substation (IHSS);
- Heat meters are to be installed at building’s level, making heat supply completely accountable. Consumption based billing for heat would be established for city’s residents.

Taking into account financial limitation only 3 out of 11 CHSS can be upgraded in such manner within the frame of this PFS. Since heating main from Amonil enters into the city from Southeast, it is naturally to initiate gradual decommissioning of central system from the very end of the pipe in the West. Under such approach the decommissioning and upgrade should start from CHS # 8, followed by # 7, and finally by # 4.

Figure 4-3. Distribution of Heat Supplied from Amonil

Central Heating Sub-Stations	Year	From Amonil			From Urban			From Urban to Buildings						Losses		
		SH (Gcal)	DHW (Gcal)	Total (Gcal)	SH (Gcal)	DHW (Gcal)	Total (Gcal)	Apartment Buildings			Commercial Building			Total (Gcal)	Prim. (%)	Second (%)
CHS-1	1998	5883	6448	12331	5605	5904	11509	4990	5674	10665	220	6	226	10891	6.7	5.37
	1999	5205	4999	10204	4902	4693	9594	4287	4482	8770	223	4	227	8997	6.0	6.23
	2000	5322	3357	8680	4924	3051	7975	4305	2939	7244	246	4	250	7494	8.1	6.03
CHS-2	1998	4190	4828	9018	3965	4438	8404	3122	4023	7144	556	244	800	7944	6.8	5.47
	1999	4250	3720	7969	4005	3391	7396	3231	2979	6210	455	259	714	6924	7.2	6.38
	2000	3763	2931	6694	3477	2407	5883	2854	2093	4947	350	277	627	5574	12.1	5.25
CHS-4	1998	4781	4498	9279	4525	4118	8643	3044	3952	6996	544	8	551	7547	6.9	12.68
	1999	4491	4222	8714	4229	3846	8075	3237	3649	6886	535	7	542	7428	7.3	8.02
	2000	3992	2937	6929	3620	2463	6083	3111	2397	5508	271	11	282	5790	12.2	4.81
CHS-5	1998	4257	3734	7991	4029	3413	7441	3353	3253	6606	393	30	423	7029	6.9	5.54
	1999	4094	4577	8670	3859	4182	8040	3234	3953	7186	318	18	336	7523	7.3	6.44
	2000	3630	2823	6452	3374	2385	5759	2857	2324	5181	269	13	282	5464	10.8	5.13
CHS-6	1998	4046	2888	6934	3829	2642	6471	3200	2849	6049	351	9	361	6410	6.7	0.94
	1999	3274	3843	7117	3089	3506	6596	2656	3334	5991	178	8	186	6176	7.3	6.35
	2000	3193	2740	5933	2903	2304	5207	2552	2233	4785	173	11	184	4969	12.2	4.58
CHS-7	1998	7203	7584	14787	6815	6931	13747	5573	6625	12198	836	38	874	13073	7.0	4.90
	1999	6524	6556	13081	6147	5972	12119	4849	5670	10519	709	4	713	11232	7.4	7.32
	2000	6725	4549	11273	6134	3846	9980	5087	3748	8835	675	8	683	9518	11.5	4.63
CHS-8	1998	6579	7186	13765	6224	6559	12782	5672	6292	11963	104	27	130	12094	7.1	5.39
	1999	5886	5621	11506	5549	5106	10656	4974	4846	9820	134	7	142	9961	7.4	6.52
	2000	5818	4388	10206	5323	3707	9030	4895	3618	8513	133	4	137	8650	11.5	4.21
CHS-9	1998	4362	2987	7349	4136	2759	6895	3789	2643	6432	29	5	33	6465	6.2	6.22
	1999	4148	3727	7875	3914	3385	7299	3568	3230	6798	29	2	32	6829	7.3	6.43
	2000	3681	3157	6839	3426	2645	6071	3156	2551	5706	32	5	37	5743	11.2	5.41
CHS-14	1998	6235	7363	13598	5900	6730	12629	4636	6186	10823	835	284	1120	11942	7.1	5.44
	1999	5721	5058	10779	5399	4616	10016	4205	4166	8371	762	233	994	9365	7.1	6.49
	2000	4923	3713	8636	4558	3495	8053	3899	3367	7266	310	30	340	7607	6.7	5.54
CHS-15	1998	6309	5430	11739	5973	4956	10928	3042	4696	7738	2516	69	2585	10322	6.9	5.54
	1999	4761	3961	8722	4488	3609	8098	2572	3398	5970	1567	39	1605	7576	7.2	6.44
	2000	3868	2427	6295	3596	2296	5892	2693	2257	4950	635	40	674	5624	6.4	4.55
CHS-20	1998	7431	6468	13899	7042	5904	12946	5944	5630	11575	607	47	653	12228	6.9	5.54
	1999	6140	5689	11829	5804	5216	11020	4833	4927	9761	507	28	535	10296	6.8	6.57
	2000	5305	4083	9388	5057	3452	8509	4184	3317	7502	430	25	455	7957	9.4	6.49
Total supply by Amonil	1998	61277	59413	120690	58041	54353	112394	46365	51824	98189	6990	767	7756	105945	6.9	5.74
	1999	54493	51973	106465	51386	47523	98909	41647	44635	86281	5416	610	6026	92307	7.1	6.67
	2000	50221	37104	87325	46393	32050	78443	39594	30845	70438	3524	428	3951	74390	10.2	5.17

Once the loan for upgrade of mentioned CHS was paid back, achieved saving might become available for re-investment into upgrade continuation of next CHS. The general idea is that with relatively small loan main network upgrade program would be initiating, then it can be proceed even without additional loans. Moving from western region of the city back to the entry of heating main at Southeast, CHS would be disconnected from central system and decommissioned one by one.

4.4 Proposed Technical Measures and Assumptions

Technical Measures

The Municipality and Urban selected CHS#8, 7, and 4 with their secondary distribution networks (see following city layout) for initial upgrade because of:

- Residents at this area more than others experienced non-adequate heat supply, being at “the end of heating pipe”;
- Payments for supplied heat in these regions are good;
- Buildings are larger and better prepared for upgrade.

Specific energy efficient measures are:

Generation side (in each boiler house):

- Each CHSS is to be substituted by 4 – 6 small boiler houses; one inside the building currently occupied by CHSS and others very close to served buildings. The total amount of small local boiler houses with the own local networks would be 15;
- Each BH would include 2- 3 efficient gas-fired boilers and chemical water treatment unit;
- All BH would be equipped with up-to-date control, which eliminates the need for permanent presence of the operator.

Distribution network:

- Dismantling of three oversized 3-pipe lengthy secondary networks; instead of each secondary network new 4 – 6 small two-pipe ones would be established. They would be made by pre-insulated pipes for space heating only;
- Removal of the domestic hot water pipes, as DHW would be prepared inside served buildings.

Demand side:

- Flushing of each buildings’ heat extraction systems (the municipal government suggested that the DH Company would complete this upgrade under a contract with individual building owners associations);
- Installation of individual heating substation (IHSS) in each building. Such IHSS would consist of: control valve, plate heat exchanger, and a pump for space heating; and plate heat exchanger(s), secondary loop circulation pump and control for DHW. As a fund-saving measure single IHSS might be used for serving of several small buildings, providing that these small buildings are located in proximity.

It is assumed that project implementation for would be done in two non-heating seasons. The rationale for a 2-year implementation schedule is:

- More affordable for the municipal budget due distribution of investments between two years,
- More feasible for implementation due distribution of construction work between two years.

Specifically for any system the upgrade of all components is to be implemented in time between the beginnings of April and the end of September. Such schedule would allow starting next heating season with completely upgraded system, allowing utmost energy savings and fast return on investments.

Assumptions

These assumptions are based on an analysis of information provided by the Company, observations made during site visits, and on some measurements made in boiler houses and selected distribution networks.

- *Year 2000 is assumed as the baseline for heat purchase and delivery to customers.*

Reported by Urban heat purchase is based on heat meters readings; these values are accepted as baseline for heat supply from Amonil. Reported by DH Company heat supply to customers also based on the reading heat meters, located at primary network at the entry to CHSS minus theoretical heat losses in CHSS and secondary networks. These data are accepted as a baseline for calculations of Urban expenses, but can't be treated as a heat actually delivered to the customers. Actual losses in CHSS and in the networks are significantly more than theoretical ones. Heat supply to customers adjusted by real measured losses in the networks is assumed as baseline heat delivery.

- *Baseline expenses should be adjusted to new conditions.*

Urban's expenses on the purchase of heat from Amonil and the delivery it to users, as it was in the year 2000 are assumed as a baseline for comparison with new expenses after implementation of proposed measures. The baseline operation as it is now, i.e. without the project should be adjusted by two recently emerged factors:

1. Starting from June 11, 2001 the cost of natural gas for users in Romania increased from \$US 45 per 1000 m³ to \$US 85 per 1000 m³.
2. It was already mentioned in previous chapter that in future Amonil would be able to supply heat to the city either from heat-only-boilers, or don't supply heat at all.

These expenses would be compared with new ones, incurred with own generation and delivery to customers, for the amount of heat consumed in the year 2000.

- *Installed capacities of new boilers would completely match space heating and DHW demands.*

Unlikely to the present situation the customers connected to new systems would be able to receive amount of heat and DHW adequate for the comfort level. It should provide additional profit for Urban from the additional sale. Furthermore, since the weather in baseline-year 2000 was warmer than usually, for average climate conditions heat sale would increase even more.

Next chapter describes in details technical arrangements in upgrade of CHSS#8 with its appropriate secondary network. As for CHSS # 7 and CHSS # 4 with secondary networks all information and main parameters of upgrade are presented in the tables. All technical solution for mentioned CHSS are similar to CHSS # 8, and don't require additional explanations.

4.3 Energy Conservation Measures

Upgrade of Network Served from CHS-8

Baseline Energy Use Conditions

SC Urban SA (the DH Company in the city of Slobozia provided information on the current performance of CHSS # 8. The rationale behind the proposal to upgrade this network by decommissioning of mentioned CHSS and erecting of 5 local boiler houses is:

- CHSS # 8 is located at the very end of heating main originating from Amonil. It is very natural to start this program of decommissioning of all 11 CHSS, which is a long-range target for Urban and the municipality, from the far end. Such approach would allow continuing operation of other CHSS and networks without any disrupting during upgrade CHSS # 8.
- Being located at the very end of "heating pipe", the residents of this district experienced worse supply than other population located closer to the heat source. Even so, non-payment for utility services by consumers in this network is lower than in many others.

- This CHSS and secondary network are in poor condition with low operating efficiency. The potential for energy saving is larger than for some other networks.

Distribution of heat supply between 11 CHSS is shown in the figure 4.1. In addition SC Urban SA provided the information regarding the users served from CHSS # 8:

Figure 4 -4. Central Heating Substation # 8 Connected Load

Directions for Distribution Pipes	Buildings								Total Demand
	Year of Construction	Walls Material	Number of Stories	Number of apartments	Number of occupants	Heated Floor Area	SH Demand	DHW Demand	
1	1989 - 2000	Panels, Brick	5, 6, 7, 8, 9	306	924	19505	1.256	0.487	1.743
2	1989 - 2000	Panels, Brick	5, 6, 7, 8, 9	306	938	19505	1.256	0.494	1.750
3	1989 - 1994	Panels, Brick	5	131	466	8349	0.537	0.278	0.815
4	1990 - 1994	Panels, Brick	5	117	424	7458	0.480	0.253	0.733
5	1991 - 1994	Panels, Brick	5	117	424	7458	0.480	0.253	0.733
Total				977	3176	62275	4.009	1.764	5.773

- The data above were reviewed by the Electrotek team. Currently, the DH system has no meters at the buildings level for measuring heat consumption. Therefore these data reported by the DH Company and presented in the figure 4.1 are based on theoretical calculations and used to support tariff requests to the State. The measurements of water temperatures at secondary network next to CHS # 8 and at users sites indicated heat losses of more than 33%, but reported less than 5%. DH Company management confirmed that during wintertime many buildings are underheated. It is clear that primary cause for such occurrence is huge heat losses in transmission and distribution, which are around of 43% from the heat left Amonil.

Evaluation of Specific Measures

The principle upgrade of CHSS # 8 with appropriate secondary networks consists of the following:

Generation side as a replacement of heat supply from CHSS # 8

- CHSS # 8 is decommissioned and substituted for 5 local BHs. Each of these BHs is servicing only few buildings, and capacity each BH is between 0.8 Gcal/h and 1.8 Gcal/h;
- One BH from the mentioned five is established inside the building currently occupied by CHSS # 8, but four others in close proximity to appropriate users;
- Each BH would include 2- 3 efficient gas-fired boilers and chemical water treatment unit;
- All BHs would be equipped with up-to-date control, which eliminates the need for permanent presence of an operator.

Transmission and distribution for five new Local Networks:

New networks are to be a two-pipe system made by pre-insulated pipes for space heating, with the cross-sections of this pipes precisely matching the heating demands. No domestic hot water (DHW) pipes would be laid, since in a future DHW will be prepared inside individual buildings (or at the annexes adjacent to these buildings).

End-Users of the region of CHSS # 8:

- Each building (or the cluster of adjusting buildings) would be equipped with the own individual heating substation (IHSS);
- Such IHSS would include: for space heating - plate heat exchanger (PHE), secondary loop circulation pump, balancing valves, and control, for domestic hot water (DHW) preparation – the own small PHE, circulation pump, and control
- Heat meters are to be installed at building’s level, making heat supply completely accountable. Consumption based billing for heat would be established for city’s residents.

Other:

There is one measure that must be done to maximize the benefits for the population from the improved heat distribution network. Residential buildings are owned by property owner’s associations, and therefore the municipal government cannot take a loan to fund demand side measures to reduce and improve energy consumption within the buildings. Presently piping systems in many buildings are clogged with sediments. The Municipal Government informed Electrotek that the flushing and cleaning of the building’s internal piping systems would be completed by the DH Company staff under direct agreements with the property owner’s associations before these buildings will be allowed to re-connected to the upgraded network.

Figure 4-3 and Figure 4-4 present the heat generation and distribution system for Local Network used to be CHSS # 8 region. Figure 4-5 shows the main parameters of CHSS # 8 region 1 before and after upgrade.

Figure 4-5. New Local Generation for CHSS # 8 Region

	(Gcal/hr)	(Units)	(Gcal/hr)	Equipment (000 US\$)	Labor (000 US\$)	Material (000 US\$)	Total (000 US\$)
1. New Boiler Houses							
BH8	1.83	3	0.6	46.88	17.689	8.844	73.408
BHMB19	1.84	3	0.6	46.88	17.689	8.844	73.408
BH43	0.86	2	0.5	28.75	10.849	5.425	45.024
BH37	0.77	2	0.4	26.25	9.906	4.953	41.108
BH54	0.77	2	0.4	26.25	9.906	4.953	41.108
Total	6.07			175.000	66.038	33.019	274.057
			(m)	(000 US\$)	(000 US\$)	(000 US\$)	(000 US\$)
2. Networks							
Pipes			3010	61.297	15.324		76.621
			(Units)	(000 US\$)	(000 US\$)	(000 US\$)	(000 US\$)
3. DSM							
IHSS			20	70.530	17.633		88.163
Total				\$ 306.827	\$ 98.994	\$ 33.019	\$ 438.840

Figure 4-6. New Local Generation for one boiler House at CHSS # 8 Region

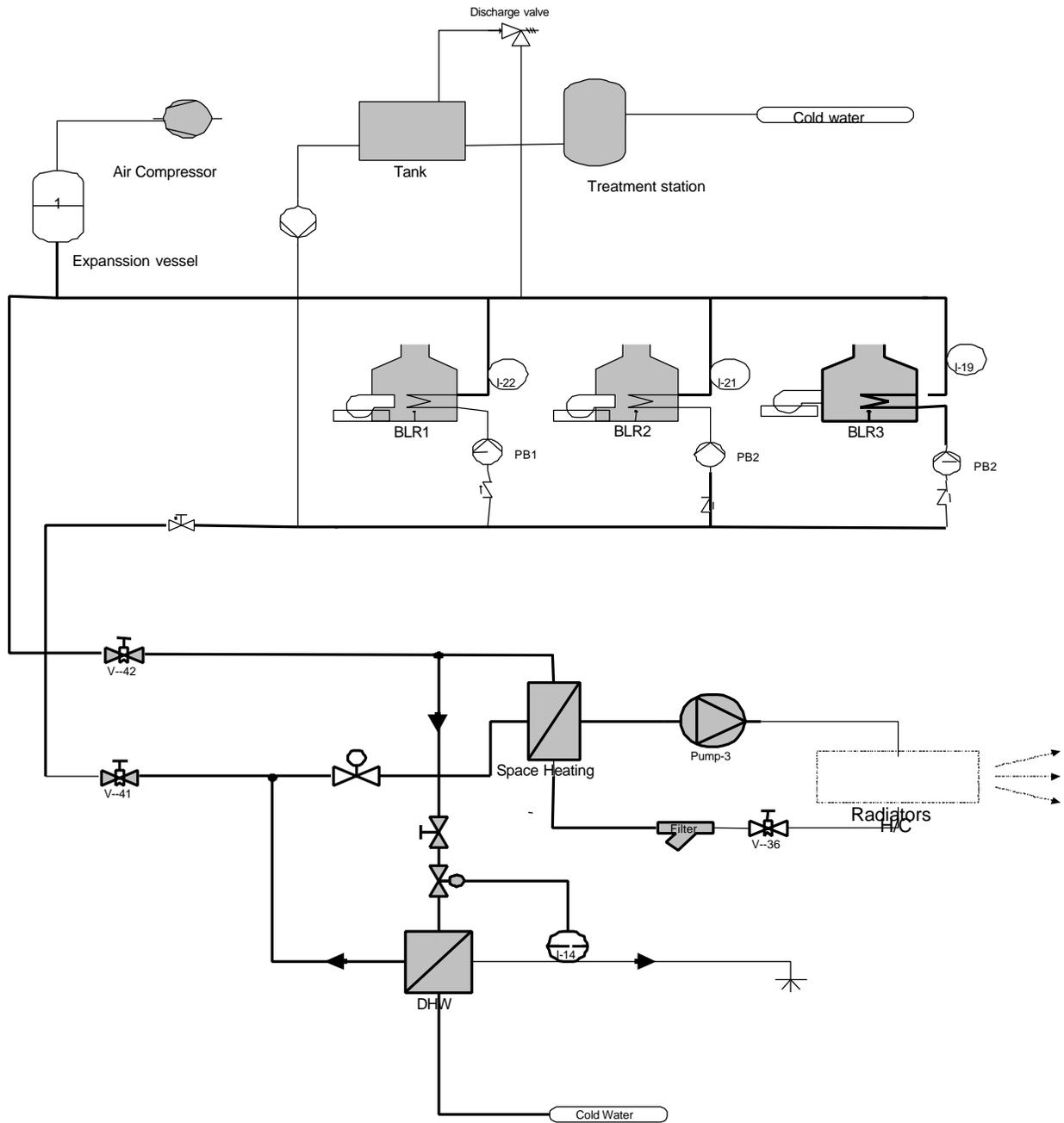
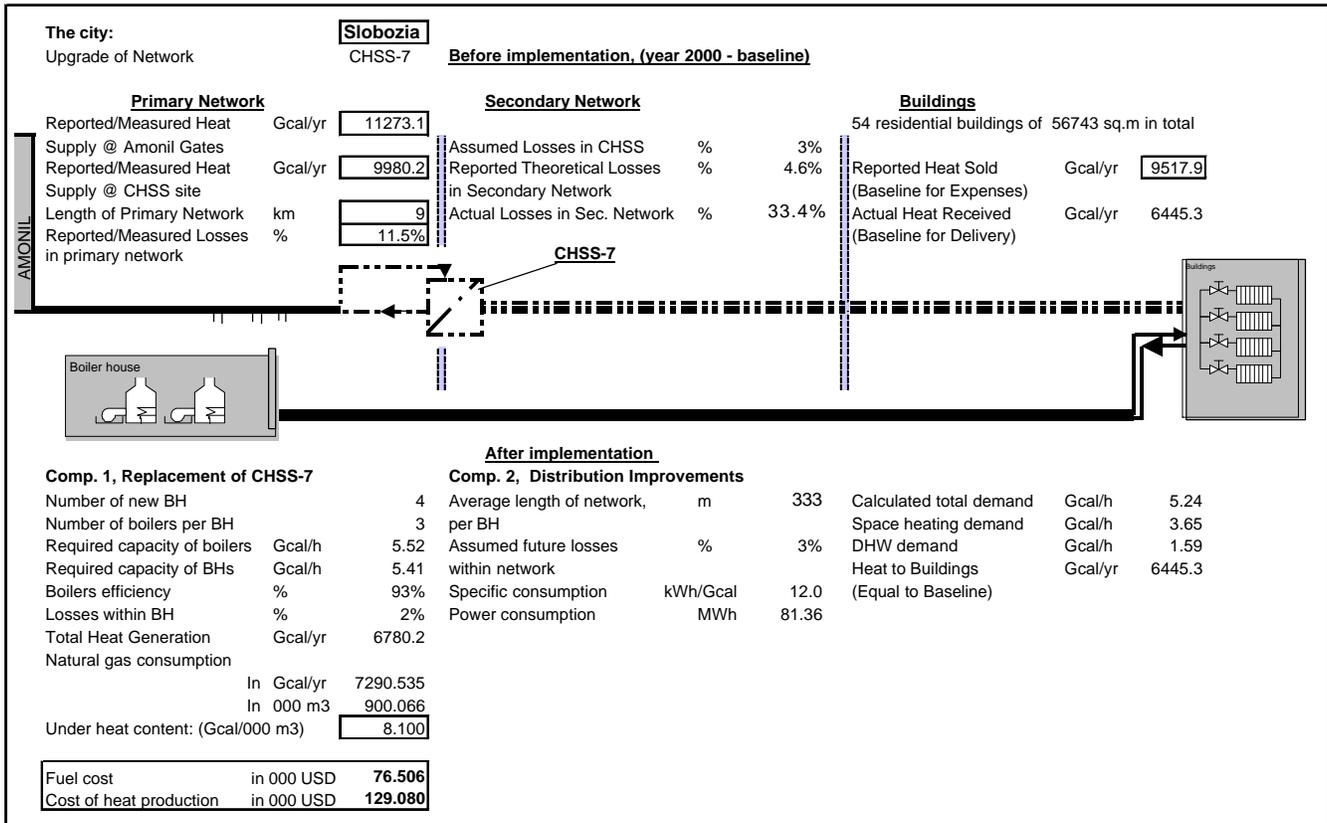


Figure 4-7. Circuit Design for Network # 7



Upgrade of Network Served from CHS-7

Baseline Energy Use Conditions

Figure 4-8. Central Heating Substation # 7 Connected Load

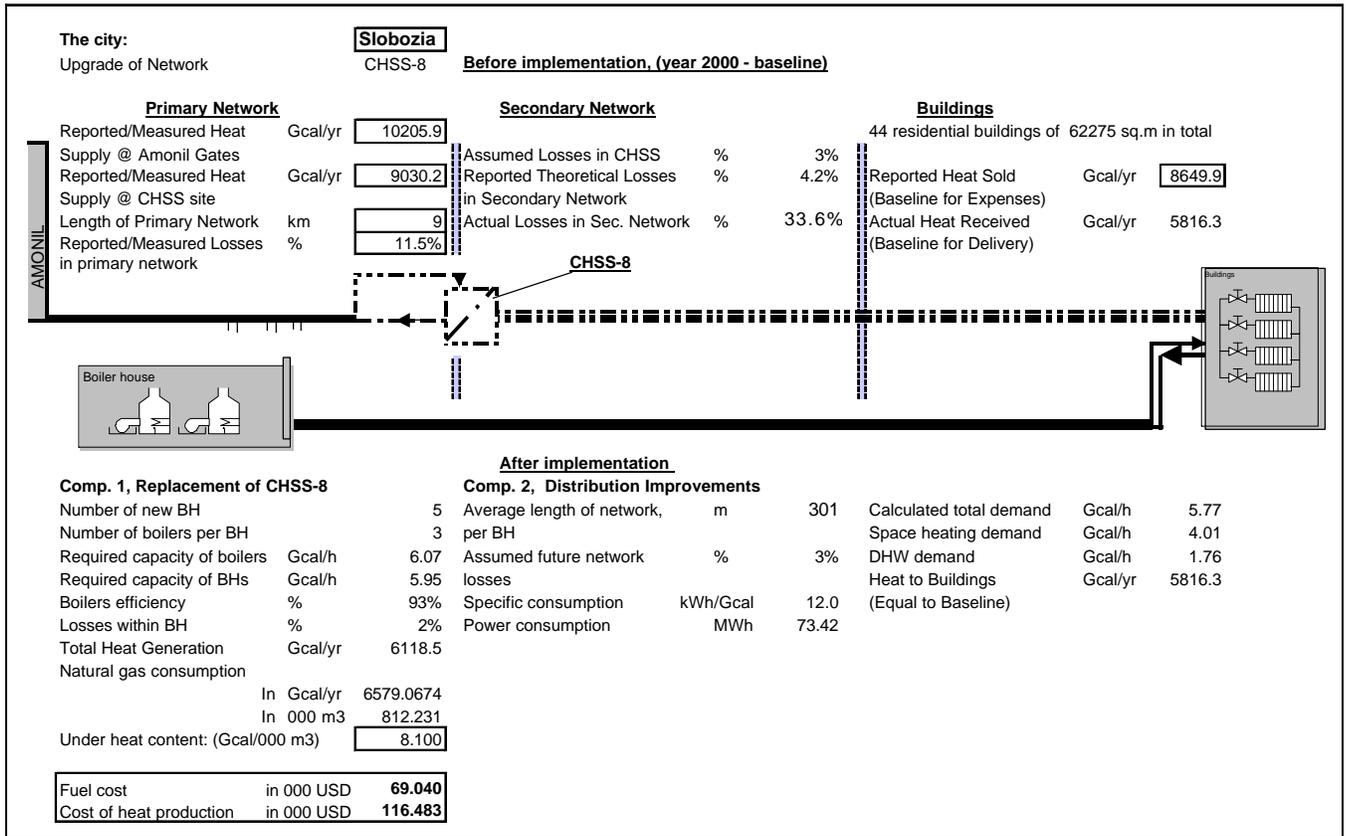
Directions for Distribution Pipes	Buildings								Total Demand
	Year of Construction	Walls Material	Number of Stories	Number of apartments	Number of occupants	Heated Floor Area	SH Demand	DHW Demand	
1	1986 - 1990	Panels, Brick	5, 7	278	758	17335	1.116	0.417	1.533
2	1987 - 1990	Panels, Brick	5	176	638	10974	0.706	0.366	1.072
3	1988 - 1990	Panels, Brick	5	176	638	10974	0.706	0.366	1.072
4	1989 - 1990	Panels, Brick	5.6.7.8	280	804	17460	1.124	0.442	1.566
Total				910	2838	56743	3.653	1.590	5.243

Evaluation of Specific Measures

Figure 4-9. New Local Generation for CHSS # 7

	(Gcal/hr)	(Units)	(Gcal/hr)	Equipment (000 US\$)	Labor (000 US\$)	Material (000 US\$)	Total (000 US\$)
1. New Boiler Houses							
BH7	1.61	3	0.6	37.50	14.151	7.075	58.726
BH38	1.13	2	0.6	31.25	11.792	5.896	48.939
BH48	1.13	2	0.6	25.00	9.434	4.717	39.151
BHMB11	1.65	3	0.6	37.50	14.151	7.075	58.726
Total	5.52			131.250	49.528	24.764	205.542
			(m)	(000 US\$)	(000 US\$)	(000 US\$)	(000 US\$)
2. Networks							
Pipes			2000	32.520	8.130		40.649
			(Units)	(000 US\$)	(000 US\$)	(000 US\$)	(000 US\$)
3. DSM							
IHSS			19	80.440	20.110		100.550
Total				\$ 244.210	\$ 77.768	\$ 24.764	\$ 346.742

Figure 4-10. Circuit design for network # 8



Baseline Energy Use Conditions

Figure 4-11. Central Heating Substation # 4 Connected Load

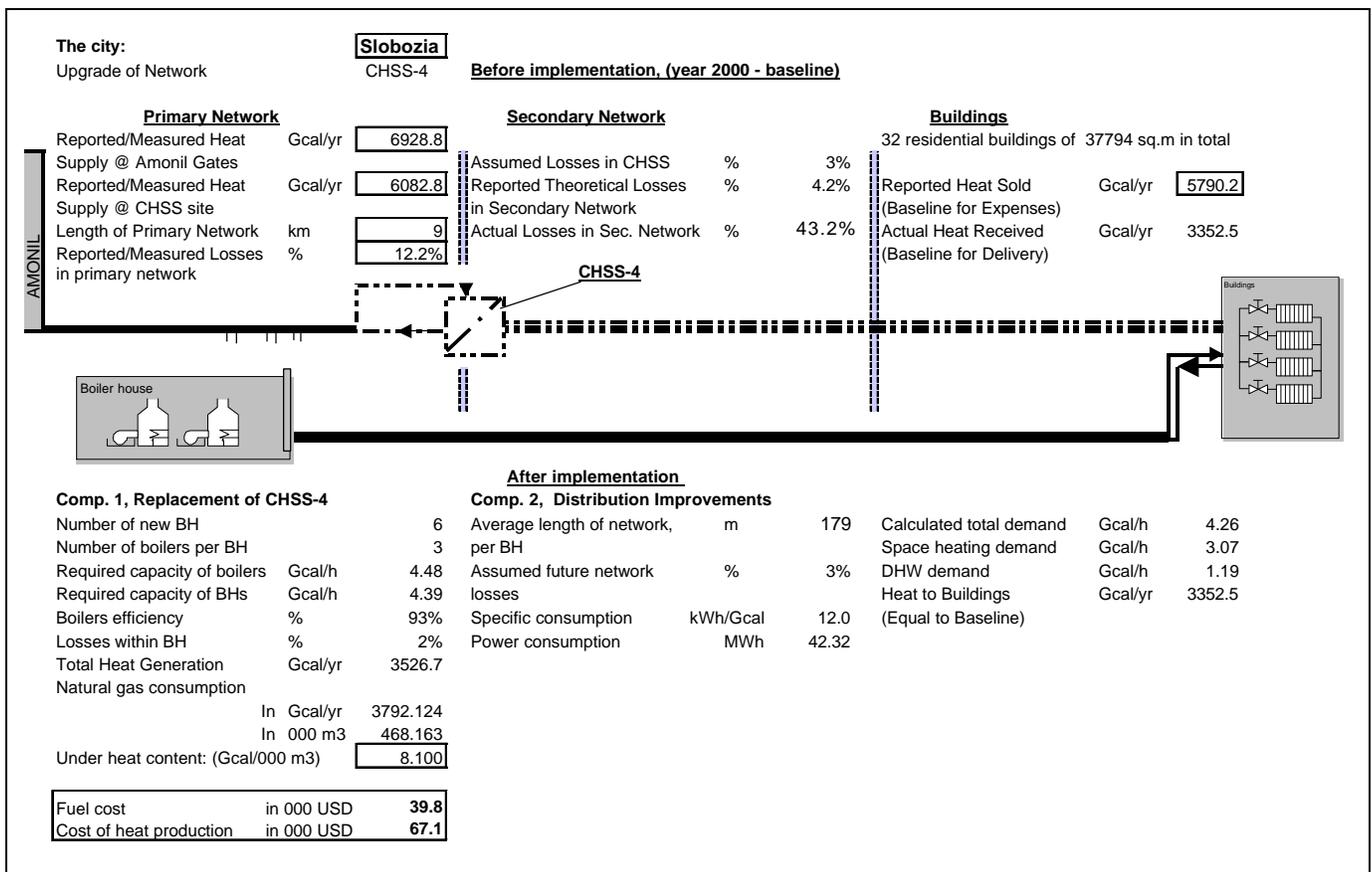
Directions for Distribution Pipes	Buildings								Total Demand
	Year of Construction	Walls Material	Number of Stories	Number of apartments	Number of occupants	Heated Floor Area	SH Demand	DHW Demand	
1	1989 - 2000	Panels, Brick	5, 6, 7, 8, 9	306	924	19505	1.256	0.487	1.743
2	1989 - 2000	Panels, Brick	5, 6, 7, 8, 9	306	938	19505	1.256	0.494	1.750
3	1989 - 1994	Panels, Brick	5	131	466	8349	0.537	0.278	0.815
4	1990 - 1994	Panels, Brick	5	117	424	7458	0.480	0.253	0.733
5	1991 - 1994	Panels, Brick	5	117	424	7458	0.480	0.253	0.733
6	1989 -1987	Panels, Brick			160	4260	0.346	0.105	0.451
Total				602	1965	37794	3.0708	1.1868	4.2575

Evaluation of Specific Measures

Figure 4-12. New Local Generation for CHSS # 4

	(Gcal/hr)	(Units)	(Gcal/hr)	Equipment (000 US\$)	Labor (000 US\$)	Material (000 US\$)	Total (000 US\$)
1. New Boiler Houses							
BH4	1.16	2	0.6	31.25	11.792	5.896	48.939
BH6	0.72	2	0.4	26.25	9.906	4.953	41.108
BHV	0.35	2	0.2	21.25	8.019	4.009	33.278
BHZ	0.93	2	0.5	28.75	10.849	5.425	45.024
BHMB5	0.85	2	0.5	28.75	10.849	5.425	45.024
BH for School of Arts	0.47	2	0.3	23.75	8.962	4.481	37.193
Total	4.48			160.000	60.377	30.189	250.566
			(m)	(000 US\$)	(000 US\$)	(000 US\$)	(000 US\$)
2. Networks							
Pipes			2150	34.418	8.605		43.023
			(Units)	(000 US\$)	(000 US\$)	(000 US\$)	(000 US\$)
3. DSM							
IHSS			11	63.300	15.825		79.125
Total				\$ 257.718	\$ 84.807	\$ 30.189	\$ 372.714

Figure 4-13. Circuit Design for Network # 4



4.5 Project Capital Cost

The breakdown of the project cost without VAT including costs of construction and installation, as well as technical and price contingencies presented in Figure 4-13.

For each network, the cost of boiler house construction is major component of the cost of entire system, between 60 % and 70 %. New transmission and distribution two-pipes systems are relatively short, and pipes' diameters do not exceed 100 mm. Thus such systems are not expensive and their cost is around 15% from the total local system cost. The rest is the cost of individual heating substations

Proposed design of boiler houses and networks upgrade is based on well-known traditional technical solutions. The costs of equipment, pipes, and construction works are consistent with similar projects in Romania and other Eastern European countries. Therefore, the probability of significant cost overrun during implementation is low, and thus the technical and price contingency margins are selected at the level of 3% and 8% respectively.

Figure 4-13. Project Cost

U.S. Dollars in Thousands	Equipment			Construction and Installation			Total		
	Year 1	Year 2	Total	Year 1	Year 2	Total	Year 1	Year 2	Total
Network # 8	307		307	132		132	439		439
Network # 7		244	244		103	103		347	347
Network # 4		258	258		115	115		373	373
Total, without VAT	307	502	809	132	218	350	439	719	1158
VAT	58	95	154	25	41	66	83	137	220
Total, with VAT	365	597	962	157	259	416	522	856	1378
Total, without VAT and price contingenc	284	465	749	122	201	324	406	666	1072
Total, without VAT, price and technical contingencies	276	451	727	119	196	314	394	647	1041

Two-year implementation schedule is recommended for the project construction:

1. Initiation of upgrade program is planned starting after the end of heating season 2001/2002 in April; CHSS # 8 with appropriate secondary network is to be upgraded in the year 2002. This network is located at the very end of heating pipe, and construction at that side would not disrupt the operation of others network. This system is most expensive one, with the cost of around 38 % from the total project cost.
2. The remaining CHSS # 7 and 4 with their networks are planned for upgrade in the year 2003, in the same manner during next non-heating season.

The rationale for a 2-year implementation schedule is that it is more affordable for the municipal budget due distribution of investments between two years, and more feasible for implementation due distribution of construction work between two years.

Specifically for the system of CHSS # 8 during the first year of construction the upgrade of all components is to be implemented in time between the beginnings of April and the end of September. Such schedule would allow starting next heating season with completely upgraded system, allowing utmost energy savings and fast return on investments. During the second year it is planned to upgrade two networks with the cost of 62 % from the total project cost. Thus it is recommended to initiate construction of new boiler houses two months early than in previous year for CHSS # 8, i.e. in February.

3. Taking into the account vital necessity for the population to have DH uninterrupted service in winter, all construction and installation work shall be carried-out during non-heating season(s) before the to the end of September. Under such time limitation it is become clear the necessity of breaking project implementation schedule into two years or in other words in two non-heating seasons. Furthermore, such schedule is more beneficial for project sponsor providing an opportunity to split the own investments between two years.
4. In order to stay in this construction schedule lesser amount of investments and work is suggested for the first year of construction. Having experience from the first year of construction more work could be done in the second year. It is very important for the future contractor to make the preparation work, such as equipment and material procurement, mostly before construction initiating.
5. The measures proposed for generation side include the following:
 - Each CHSS is to be substituted by 4 – 6 small boiler houses; one inside the building currently occupied by CHSS and others very close to served buildings. The total amount of small local boiler houses with the own local networks would be 15.
 - Each BH would include 2- 3 efficient gas-fired boilers and chemical water treatment unit;
 - All BH would be equipped with up-to-date control, which eliminates the need for permanent presence of the operator.
6. Proposed measures for networks are:
 - Dismantling of three oversized 3-pipe lengthy secondary networks. Each secondary network would be substituted for new two-pipe ones. Each network would be connected to new boiler house and made by pre-insulated pipes for space heating only;
 - Removal of the domestic hot water pipes, as DHW would be prepared inside served buildings.
7. At demand side, in each building individual heating substations (IHSS) will be introduced. Such IHSS would consist of:
 - Plate heat exchanger (PHE), control valve and secondary loop pump for space heating,
 - PHE, circulation pump and control for DHW.

4.6 Project Savings and Simple Payback Period

The summary of estimated savings with implementation of the energy efficiency measures outlined in Section 4.5 for 3 CHSS and networks are presented in Figure 4-14. This project is dealing with substitution of heat purchase for own distributed generation. Due to present remote location of heat source, namely “Amonil” heat losses in transmission/distribution are very high, and maintenance cost are high as well. Energy efficiency improvements associated with local generation at efficient small boiler houses provides excellent simple payback of 3.3 years for the project in total.

Figure 4-14. Project Savings

		Total	Network 8	Network 7	Network 4
Heat produced by Amonil and distributed by Urban					
Energy	(Gcal/yr)	23958.0	8649.89	9517.92	5790.19
Cost	('000 US\$/yr)	\$ 625.098	\$ 225.688	\$ 248.336	\$ 151.074
Heat generated by new installed boilers					
Natural gas					
Energy	'000 m ³ /yr	-2180.460	-812.231	-900.066	-468.163
Cost	('000 US\$/yr)	\$ (185.339)	\$ (69.040)	\$ (76.506)	\$ (39.794)
Electricity					
Energy	(MWh/yr)	-197.10	-73.42	-81.36	-42.32
Cost	('000 US\$/yr)	\$ (11.728)	\$ (4.369)	\$ (4.841)	\$ (2.518)
Other expenses					
Labor	('000 US\$/yr)	\$ (64.901)	\$ (24.176)	\$ (26.790)	\$ (13.935)
Maintenance	('000 US\$/yr)	\$ (41.543)	\$ (15.475)	\$ (17.148)	\$ (8.920)
Water	('000 US\$/yr)	\$ (1.194)	\$ (0.44)	\$ (0.493)	\$ (0.256)
Others	('000 US\$/yr)	\$ (7.998)	\$ (2.98)	\$ (3.302)	\$ (1.717)
Total other expenses	('000 US\$/yr)	\$ (115.636)	\$ (43.075)	\$ (47.733)	\$ (24.828)
Total heat generation cost	('000 US\$/yr)	\$ (312.703)	\$ (116.483)	\$ (129.080)	\$ (67.140)
Savings	('000 US\$/yr)	\$ 312.394	\$ 109.204	\$ 119.256	\$ 83.934
Investments	('000 US\$)	\$ 1,041.259	\$ 394.499	\$ 311.706	\$ 335.054
Simple payback period	(Years)	3.3	3.6	2.6	4.0
<hr/>					
Estimated present expenses	(US\$/Gcal)	26.09			
Natural gas price	(US\$/'000 m3)	85.0			
Electricity price	(US\$/MWh)	59.50			
Raw water price	(US\$/'000 m3)	58.23			

5 Financing Plan

5.1 Type and Amount of Finance Required

Under the base case, the total project cost is US\$ 1,051 K without VAT. Expected total financial resources include debt financing in the amount of US\$ 729 K from lending institutions and US\$ 312 K from the municipal budget including US\$ 10 K for payments of the interest, which exceeds savings during the construction period. The estimated debt-to-equity ratio is 69:31 (Figure 5-1).

Figure 5-1. Project Cost and Capital Structure

Project Cost			
Base project cost	\$	1,041,259	
Capitalized interest during construction	\$	-	
Interest exceeding savings during construction	\$	9,665	
Principal paid during construction	\$	-	
Additional working capital during construction	\$	-	
Total Project Cost	\$	1,050,924	
Base Capital Structure			
Debt	\$	728,881	70.0%
Equity	\$	312,378	30.0%
Total Investments	\$	1,041,259	100.0%
Financial Scheme			
Total loan requested	\$	728,881	69.4%
Project sponsor's contribution			
Investments	\$	312,378	
Interest during construction	\$	9,665	
Total project sponsor's contribution	\$	322,043	30.6%
Other contributions	\$	-	0.0%
Total Investments	\$	1,050,924	100.0%

5.2 Proposed Financial Schemes

Financing Sources and Risk Sharing

Reviewing opportunities for commercial energy efficiency project financing Electrotek took into accounting following considerations:

1. The real financial status of district heating companies and opportunities for its improvement in the next 9-12 months;
2. The actual financial status of municipal budget and its projection;
3. The status of Romanian banking systems in terms of long-term project financing;
4. The project cost and its potential structure of ownership;

5. Other financial, institutional and legal issues, which are important for structuring commercial financing.

Obstacles for structuring long-term project financing under the current economic, financial institutional and legal environment in Romania are the following:

- It is difficult to secure commercial bank loans with 3 to 5 year maturity without external credit risk mitigation and loan security.
- The IFC, which focuses mainly on private sector project financing, is not very interested in the improvement of municipally owned facilities.
- Financial schemes with foreign vendor's credits or Eximbank participation are realistic, but they often require 100%-banking guarantee or some minimal level of project sponsors credit rating confirmed by international rating agencies.

Although there is a possibility to utilize a newly created World Bank/GEF energy efficiency fund, this fund is not specifically focused on municipal projects and, additionally, its planned financing transactions might be too small for the current project.

Initial discussions with a number of commercial banks indicate that:

- Some Romanian and international commercial banks are interested in long-term project financing under the condition of credit risk sharing.
- Detailed project financial and risk analysis and disclosure of the financial indicators of the project sponsors increase probability of the deal success.
- External mitigation of the credit risk should significantly facilitate financial deal structuring by municipalities and municipally owned companies.

In addition there are some initial promising results of the Municipality and the Company discussions with potential equipment vendors opportunities for the vendor's credit.

Considering all of the above, the following financial schemes with five-year maturity should be viable:

Scheme 1. Favorable Development

Sources of debt financing

- Principal Financing – US\$ 510 K (70% of the total debt) from commercial lenders with DCA Guarantees covering up to 50% of the funding or up to US\$ 225 K
- Co-financing – US\$ 219 K (30% of the debt) from the equipment vendor

Risk sharing

- U.S. Government – 35%
- Commercial lenders – 35%
- Equipment vendor – 30%

Maturity

- Five years.

Scheme 2. Intermediate Development

Sources of debt financing

- Principal Financing – US\$ 729 K (100% of the total debt) from commercial lenders with DCA Guarantees covering up to 50% of the funding or up to US\$ 364.5 K.

Risk sharing

- U.S. Government - 50%
- Commercial lenders – 50%

Maturity

- Five years.

Scheme 3. Pragmatic Development

Sources of debt financing

- Principal Financing – US\$ 729 K (100% of the total debt) from commercial lenders.

Risk sharing

- Commercial lenders – 100%

Maturity

- Five years.

Electrotek evaluated two different approaches to the implementation of any of the three financial schemes above. Both approaches propose to use an escrow account to secure the loan repayment. The escrow account is a cash or cash equivalent account administered by the lender on behalf of the borrower (the municipality). The escrow account ultimately benefits the lender.

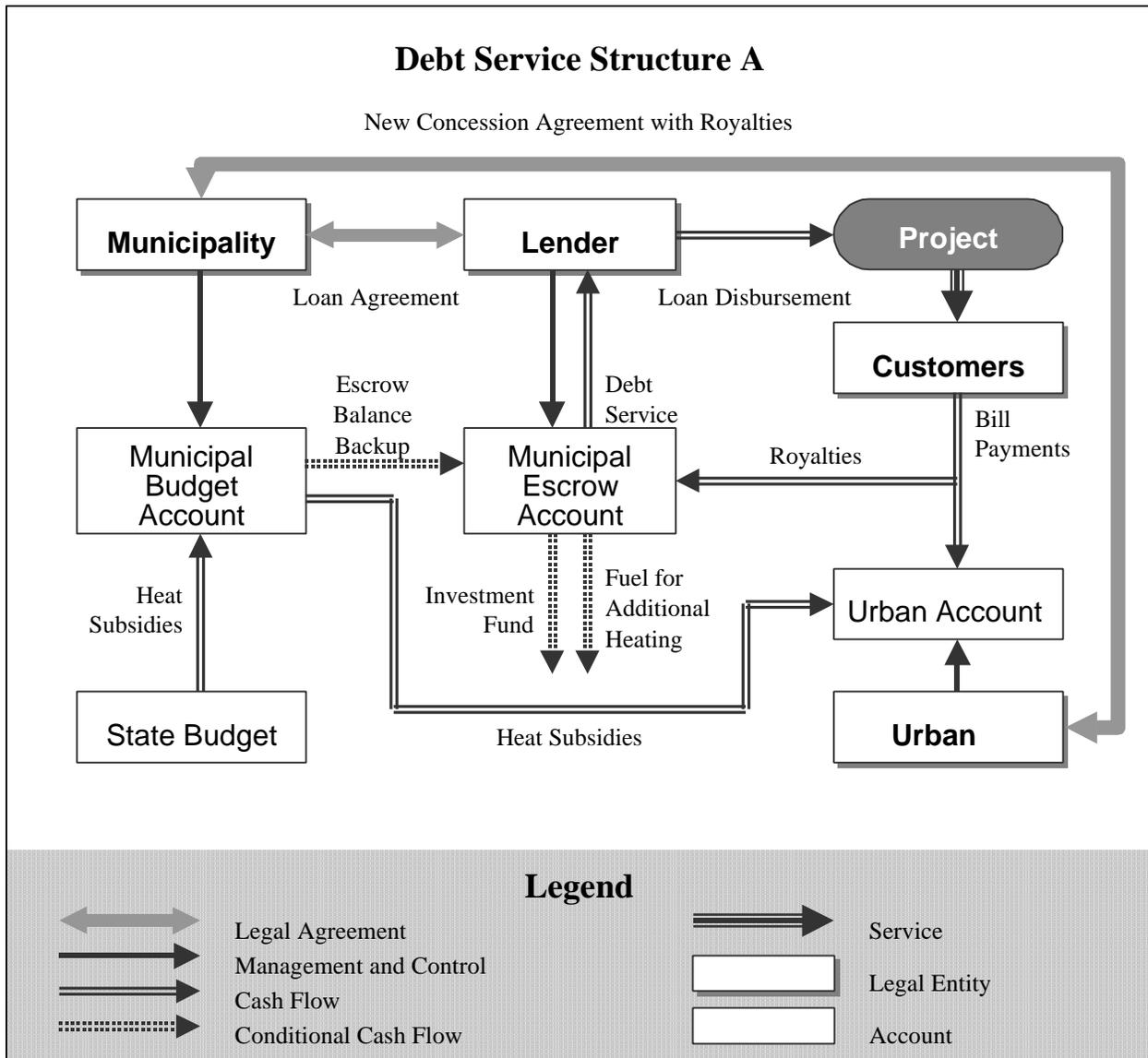
The Slobozia Municipality as a Project Sponsor

Under the first approach, the municipality of Slobozia is the project sponsor. The loan is taken out by the municipality, and the Municipality provides loan guarantees to assure the loan repayment to the lender.

The approach uses introduction of royalties to capture the positive cash flow arising from energy cost savings from the project. As was discussed before, royalties are a legitimate part of the tariff structure, and according to the concession agreement Urban pays royalties to the Municipality for the utilization of municipal tangible assets. A new concession agreement imposing some additional royalties on Urban would allow keeping the heat tariffs at the present level even with the fuel cost decreased. Since the Municipality provides funds for rehabilitation of the district heating system operated by Urban, it is logical and justifiable that it is permitted to recover these funds from royalties paid by Urban. The bulk of this payments will come from the state heat subsidies, which is also appropriate, since investment into Slobozia municipal infrastructure will bring the cost of services down, in due course saving the state money it would otherwise be forced to spend on subsidies in the years to come.

Under Debt Service Structure A (Figure 5-3), monthly heat payments from Urban’s best-paying customers are deposited into the municipality’s escrow account in order to meet the loan obligation. After the regular debt service is met, the surplus is always transferred to the municipal or Urban’s business account for other district heating needs including reinvestments in other facilities. If Urban’s customers do not pay on time, or the amount, even though collected in full, is not sufficient to cover debt service obligations due to inflation, it is assumed the municipal revenues or the municipal reserve fund can be used as a last resort to ensure the loan repayment (Figures 5-3).

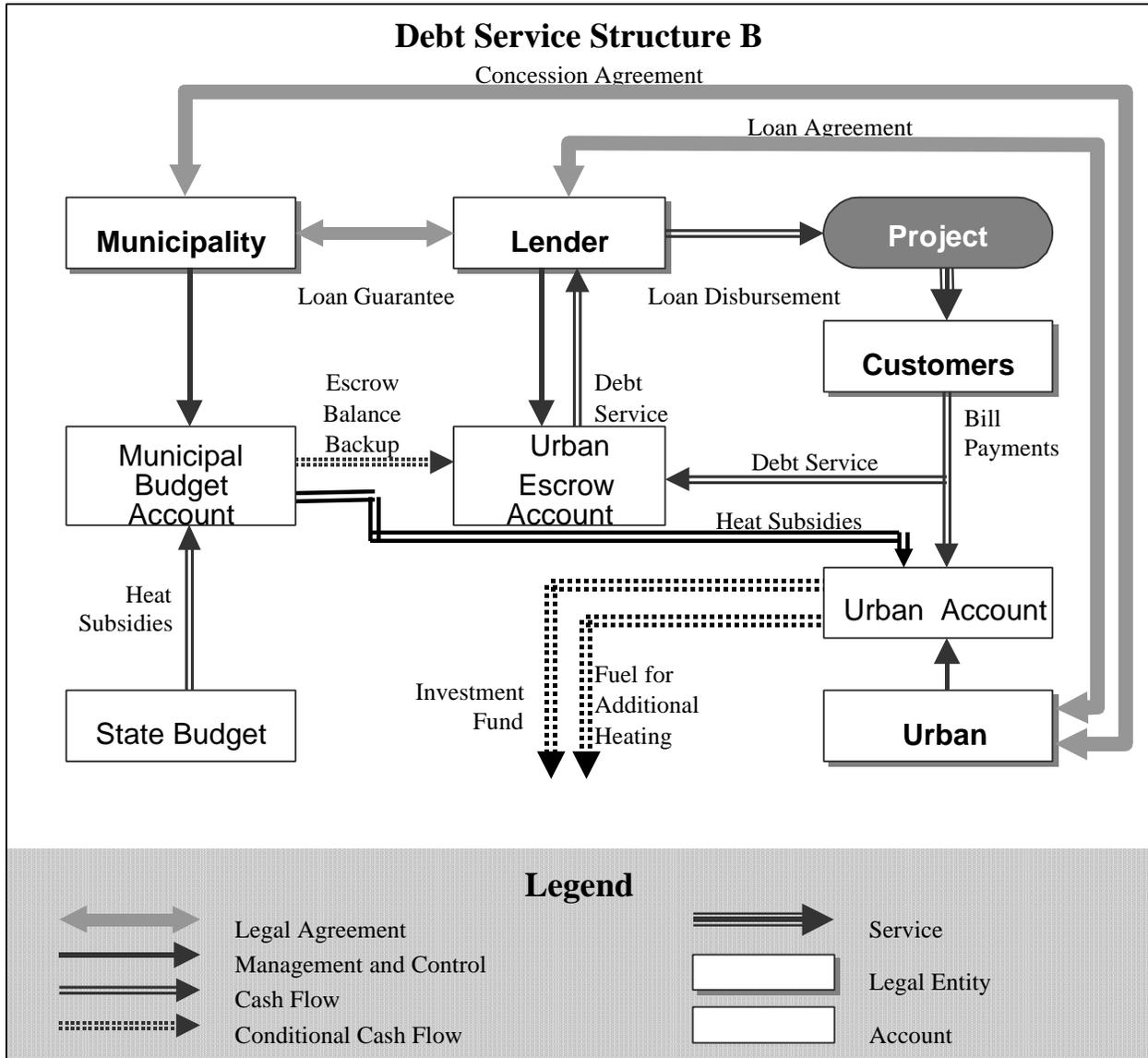
Figure 5-3. Debt Service Structure A: Municipality as a Project Sponsor



Urban as a Project Sponsor

This second approach assumes that Urban is a project sponsor. Operationally, the Urban will guarantee loan repayment. However, it is likely that the lender will require the Slobozia Municipality to provide loan guarantees.

Figure 5-4. Debt Service Structure B: Urban as a Project Sponsor



Debt Service Structure B (Figure 5-4) assumes that Urban establishes an escrow account to capture project energy cost savings. As with Structure A, payments for heat from Urban’s most reliable customers are deposited into the escrow account until debt service is met. The municipality provides guarantees. If Urban’s customers do not pay on time, or the amount, even though collected in full, is not sufficient to cover debt service obligations due to inflation, it is assumed the municipal revenues or the municipal reserve fund can be used as a last resort to ensure the loan repayment.

Comparative Analysis of the Proposed Debt Service Structures

Both Structures are feasible and can be successfully implemented. However, each offers slight advantages in different areas and, therefore, can prove preferable under specific circumstances (financial and legal positions of the Municipality and Urban, goals and purposes of the lenders).

Structure A.

Pluses

- Municipality as a real investor (in equity) is exposed to the project risks and therefore reduces credit risk for the lenders;
- The use of royalties as a tool for debt repayment simplifies legal and regulatory approval of the proposed project implementation scheme:
 - a. The issue of royalties and their volume is the subject for direct commercial negotiations between the municipality and Urban and does not formally require approval by any other party;
 - b. Credit risk is low, since the balance of the escrow account is expected to exceed the required level by a number of times, and in addition backed by municipal assets.

Minuses

- District heating is not a core business for the Municipality. Municipal authorities have inadequate technical or operational experience with district heating, and therefore their ability to control project implementation is limited.

Structure B.

Pluses

- As a company directly involved in providing municipal services, Urban has a direct interest in renovation of their assets, introduction of new, efficient technologies, etc. Since the project is just a first stage of the long-term investment, But in addition to this professional interest, under the structure B Urban is directly responsible for the loan repayment and therefore is more likely to ensure timely and efficient project implementation.

Minuses

- Urban must be creditworthy and demonstrate the ability to repay the loan.
- Since Urban is borrower, even with municipal guarantees, the lender may consider a loan as more risky, which might be reflected in less favorable loan terms and conditions.
- The source for the loan repayment is more problematic: interest expenses can be included in the tariff structure as legitimate operating expenses, but principal will have to be repaid out of greatly increased profitability ratio. This arrangement will rely heavily on continuous cooperation and approval of ANRE.

6 Project Cash Flow Analysis

6.1 Base Case Assumptions

The base case assumes that the debt financing will be in US dollars with a fixed interest rate. The applied current interest on outstanding loan principal is 12%, which currently is 8% above the six-month LIBOR. The interest rate is paid monthly without a grace period, and the loan principal is off in equal parts. The loan is effective from April 1, 2002. The loan principal repayment period is five years including the construction period (Figure 6-1). The construction ends September 30, 2003, and thus, the loan repayment period continues only three years and six months after the project is finished.

Figure 6-1. Project Evaluation Period and Loan Conditions

Evaluation Period		
Current year		2001
Construction begins	(da/mo/year)	1-Apr-02
Construction ends	(da/mo/year)	30-Sep-03
Operation begins	(da/mo/year)	1-Oct-02
Operation ends	(da/mo/year)	30-Oct-17
Loan conditions		
Total disbursement	(US\$)	728,881
Disbursement begins	(da/mo/year)	1-Apr-02
Interest payment begins	(da/mo/year)	30-Apr-02
Payment on principal		
Begins	(da/mo/year)	31-Oct-03
Maturity	(da/mo/year)	31-Mar-07
Number of payments		42
Payment amount	(US\$)	17,354
Interest Rate	(%)	12.00%

Loan disbursement and amortization schedules as well as debt service schedule are shown in Figure 6-2. The schedule shows that interest will be paid on monthly basis without capitalization during the construction. Loan principal will be paid monthly also starting October 2003 and returned in five years including eighteen months of the construction period.

Figure 6-2. Loan Disbursement and Amortization Schedule

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
2002													
Loan Disbursement	0	0	0	46,025	46,025	46,025	46,025	46,025	46,025	0	0	0	276,149
Payment of interest	0	0	0	460	920	1,381	1,841	2,301	2,761	2,761	2,761	2,761	17,950
Repayment of principal	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Sponsor's Contribution	0	0	0	19,725	19,725	19,725	19,725	19,725	19,725	0	0	0	118,350
Principal Outstanding													
Beginning of Month	0	0	0	46,025	92,050	138,075	184,099	230,124	276,149	276,149	276,149	276,149	
End of Month	0	0	0	46,025	92,050	138,075	184,099	230,124	276,149	276,149	276,149	276,149	
2003													
Loan Disbursement	0	27,377	27,377	66,330	66,330	66,330	66,330	66,330	66,330	0	0	0	452,732
Payment of interest	2,761	3,035	3,309	3,972	4,636	5,299	5,962	6,626	7,289	7,289	7,115	6,942	64,235
Repayment of principal	0	0	0	0	0	0	0	0	0	17,354	17,354	17,354	52,063
Project Sponsor's Contribution													0
Principal Outstanding													
Beginning of Month	276,149	303,526	330,903	397,232	463,562	529,892	596,222	662,551	728,881	728,881	711,527	694,172	
End of Month	276,149	303,526	330,903	397,232	463,562	529,892	596,222	662,551	728,881	711,527	694,172	676,818	
2004													
Loan Disbursement	0	0	0	0	0	0	0	0	0	0	0	0	0
Payment of interest	6,768	6,595	6,421	6,248	6,074	5,900	5,727	5,553	5,380	5,206	5,033	4,859	69,764
Repayment of principal	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	208,252
Project Sponsor's Contribution													0
Principal Outstanding													
Beginning of Month	676,818	659,464	642,109	624,755	607,401	590,047	572,692	555,338	537,984	520,629	503,275	485,921	
End of Month	659,464	642,109	624,755	607,401	590,047	572,692	555,338	537,984	520,629	503,275	485,921	468,566	
2005													
Loan Disbursement	0	0	0	0	0	0	0	0	0	0	0	0	0
Payment of interest	4,686	4,512	4,339	4,165	3,991	3,818	3,644	3,471	3,297	3,124	2,950	2,777	44,774
Repayment of principal	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	208,252
Project Sponsor's Contribution													0
Principal Outstanding													
Beginning of Month	468,566	451,212	433,858	416,503	399,149	381,795	364,441	347,086	329,732	312,378	295,023	277,669	
End of Month	451,212	433,858	416,503	399,149	381,795	364,441	347,086	329,732	312,378	295,023	277,669	260,315	
2006													
Loan Disbursement	0	0	0	0	0	0	0	0	0	0	0	0	0
Payment of interest	2,603	2,430	2,256	2,083	1,909	1,735	1,562	1,388	1,215	1,041	868	694	19,784
Repayment of principal	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	17,354	208,252
Project Sponsor's Contribution													0
Principal Outstanding													
Beginning of Month	260,315	242,960	225,606	208,252	190,897	173,543	156,189	138,834	121,480	104,126	86,772	69,417	
End of Month	242,960	225,606	208,252	190,897	173,543	156,189	138,834	121,480	104,126	86,772	69,417	52,063	
2007													
Loan Disbursement	0	0	0	0	0	0	0	0	0	0	0	0	0
Payment of interest	521	347	174	0	0	0	0	0	0	0	0	0	1,041
Repayment of principal	17,354	17,354	17,354	0	0	0	0	0	0	0	0	0	52,063
Project Sponsor's Contribution													0
Principal Outstanding													
Beginning of Month	52,063	34,709	17,354	0	0	0	0	0	0	0	0	0	104,126
End of Month	34,709	17,354	0	0	0	0	0	0	0	0	0	0	52,063

6.2 Project Financial Analysis

Capital Investment Decision Indicators

The Capital Investment Decision Indicators (financial internal rate of return (IRR), net present value (NPV), and the payback period) were calculated for project cash flows before financing (net free cash flow). Net free cash flows were discounted at the fixed rate of 15%. During the first heating season (2002/2003) only part of technical measures will be implemented, therefore, the energy and cost savings are less than in subsequent years.

Figure 6-3 summarizes results of the computation of IRR, NPV, and Payback Period for the project.

Figure 6-3. Project Financial Results

	Investments (US\$)	Savings					IRR (%)	NPV (US\$)	Payback Period (Years)
		2002 (US\$)	2003 (US\$)	2004 (US\$)	2005 (US\$)	2006 (US\$)			
Network 8	\$ 394,499	\$ 43,682	\$ 109,204	\$ 109,204	\$ 109,204	\$ 109,204	30%	\$ 283,045	3.46
Network 7	\$ 311,706	\$ -	\$ 47,702	\$ 119,256	\$ 119,256	\$ 119,256	45%	\$ 358,935	2.47
Network 4	\$ 335,054	\$ -	\$ 33,574	\$ 83,934	\$ 83,934	\$ 83,934	27%	\$ 152,041	3.84
Total	\$ 1,041,259	\$ 43,682	\$ 190,480	\$ 312,394	\$ 312,394	\$ 312,394	33%	\$ 794,020	3.83

The cash flow analysis indicates the payback period for the whole project is 3.8 years, the IRR for the total capital investment is 33%. Assuming a fixed discount rate of 15%, the NPV is US\$ 794 K M or 75% of the total project cost. All subprojects included in the investment package demonstrated also very promising capital budgeting indicators. The lowest IRR is 27%, and the longest back period is 3.84 years for the upgrade of the network 4.

Therefore, the project has a promising financial viability and should be recommended for the implementation.

6.3 Cash Flow Analysis

The Project Annual Cash Flow Statement (Figure 6-4) illustrates projects' ability to ensure successful debt financing. Even during the construction period, when only part of technical measures will be implemented, increase in cash amounts to US\$ 26 K and UD\$ 74 K at the end of 2002 and 2003, respectively. The Project Monthly Cash Flow Statement (Figure 6-5) shows that in 2002 the project sponsor needs only US\$ 10 K of the working capital for six months from April to September 2002 to pay interests before getting first savings in October. Starting October 2002 the part of implemented technical measures provides cash to pay interest. After the project completion in September 2003, the project cash exceeds the monthly principal payments during the proposed three years and six months of the loan principal repayment period.

Therefore, the project generates substantial cash to serve debt before the maturity including the period of the construction.

Moreover, the project provides considerable extra cash that might be utilized for other urgent district heating needs. The Figure 6-4 shows that during the loan principal repayment period in 2004-2006 the project provides the annual net cash increase from US\$ 34 to US\$ 84 K as of December 31. In March 2007 loan is paid off, and at the end of the year net cash increase amounts US\$ 259 K. Starting 2008 the project generates annual net cash in the amount of US\$ 312 K.

Figure 6-4. Project Annual Cash Flow Statement for 2002-2008

Cash Flow from Savings and Investments								
(US Dollars)	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2016
Cash Flow from Savings								
Electricity	\$ (1,747)	\$ (7,312)	\$ (11,728)	\$ (11,728)	\$ (11,728)	\$ (11,728)	\$ (11,728)	\$ (11,728)
Thermal Energy	\$ 90,275	\$ 385,452	\$ 625,098	\$ 625,098	\$ 625,098	\$ 625,098	\$ 625,098	\$ 625,098
Gas	\$ (27,616)	\$ (115,559)	\$ (185,339)	\$ (185,339)	\$ (185,339)	\$ (185,339)	\$ (185,339)	\$ (185,339)
O&M	\$ (17,230)	\$ (72,099)	\$ (115,636)	\$ (115,636)	\$ (115,636)	\$ (115,636)	\$ (115,636)	\$ (115,636)
Net Cash Flow Provided by Savings	\$ 43,682	\$ 190,480	\$ 312,394	\$ 312,394	\$ 312,394	\$ 312,394	\$ 312,394	\$ 312,394
Cash Flow Before Financing								
Interest	\$ (17,950)	\$ (64,235)	\$ (69,764)	\$ (44,774)	\$ (19,784)	\$ (1,041)	\$ (0)	\$ -
Net Cash Flow Before Financing	\$ (17,950)	\$ (64,235)	\$ (69,764)	\$ (44,774)	\$ (19,784)	\$ (1,041)	\$ (0)	\$ -
Net Cash Flow from Investments	\$ (394,499)	\$ (646,760)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Flow From Financing								
Loan Disbursement	\$ 276,149	\$ 452,732	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Project Sponsor's Contribution	\$ 118,350	\$ 194,028	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Principal	\$ -	\$ (52,063)	\$ (208,252)	\$ (208,252)	\$ (208,252)	\$ (52,063)	\$ -	\$ -
Net Cash Flow from Financing	\$ 394,499	\$ 594,697	\$ (208,252)	\$ (208,252)	\$ (208,252)	\$ (52,063)	\$ -	\$ -
Increase (Decrease) in Cash	\$ 25,732	\$ 74,183	\$ 34,378	\$ 59,369	\$ 84,359	\$ 259,290	\$ 312,394	\$ 312,394
Cash, Beginning of Year	\$ 9,665	\$ 35,397	\$ 109,580	\$ 143,958	\$ 203,327	\$ 287,686	\$ 546,976	\$ 3,046,132
Cash, End of Year	\$ 35,397	\$ 109,580	\$ 143,958	\$ 203,327	\$ 287,686	\$ 546,976	\$ 859,371	\$ 3,358,527
Cash Flow Analysis								
(US Dollars)	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2016
Net Free Cash Flow	\$ (350,817)	\$ (456,280)	\$ 312,394	\$ 312,394	\$ 312,394	\$ 312,394	\$ 312,394	\$ 312,394
Discounted Net Free Cash Flow	\$ (350,817)	\$ (396,765)	\$ 236,215	\$ 205,404	\$ 178,613	\$ 155,315	\$ 135,057	\$ 44,150
Cumulative Cash Flow	\$ (350,817)	\$ (807,096)	\$ (494,702)	\$ (182,307)	\$ 130,087	\$ 442,482	\$ 754,876	\$ 3,254,032
IRR	<u>33%</u>							
NPV	<u>\$ 794,020</u>							
Payback Period (Years)	<u>3.84</u>							

Figure 6-5. Project Monthly Annual Cash Flow Statement for 2002-2004

Monthly Project Cash Flow												
(US Dollars)	2002 31-Jan	2002 28-Feb	2002 31-Mar	2002 30-Apr	2002 31-May	2002 30-Jun	2002 31-Jul	2002 31-Aug	2002 30-Sep	2002 31-Oct	2002 30-Nov	2002 31-Dec
Cash Flow from Savings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,460	\$ 21,841
Cash Flow Before Financing	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest	\$ -	\$ -	\$ -	\$ (460)	\$ (920)	\$ (1,381)	\$ (1,841)	\$ (2,301)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)
Including Exceeding of Savings During Construction	\$ -	\$ -	\$ -	\$ (460)	\$ (920)	\$ (1,381)	\$ (1,841)	\$ (2,301)	\$ (2,761)	\$ -	\$ -	\$ -
Net Cash Flow Before Financing	\$ -	\$ -	\$ -	\$ (460)	\$ (920)	\$ (1,381)	\$ (1,841)	\$ (2,301)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)
Net Cash Flow from Investments	\$ -	\$ -	\$ -	\$ (65,750)	\$ (65,750)	\$ (65,750)	\$ (65,750)	\$ (65,750)	\$ (65,750)	\$ -	\$ -	\$ -
Cash Flow From Financing	\$ -	\$ -	\$ -	\$ 46,025	\$ 46,025	\$ 46,025	\$ 46,025	\$ 46,025	\$ 46,025	\$ -	\$ -	\$ -
Loan Disbursement	\$ -	\$ -	\$ -	\$ 20,185	\$ 20,645	\$ 21,106	\$ 21,566	\$ 22,026	\$ 22,486	\$ -	\$ -	\$ -
Project Sponsor's Contribution	\$ -	\$ -	\$ -	\$ 19,725	\$ 19,725	\$ 19,725	\$ 19,725	\$ 19,725	\$ 19,725	\$ -	\$ -	\$ -
Including Contribution in Construction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Principal	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repayment of other long-term debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flow from Financing	\$ -	\$ -	\$ -	\$ 66,210	\$ 66,670	\$ 67,131	\$ 67,591	\$ 68,051	\$ 68,511	\$ -	\$ -	\$ -
Increase (Decrease) in Cash	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,699	\$ 13,619	\$ 19,079
Cash, Beginning of Month	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,699	\$ 16,318
Cash, End of Month	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,699	\$ 16,318	\$ 35,397

Monthly Project Cash Flow												
(US Dollars)	2003 31-Jan	2003 28-Feb	2003 31-Mar	2003 30-Apr	2003 31-May	2003 30-Jun	2003 31-Jul	2003 31-Aug	2003 30-Sep	2003 31-Oct	2003 30-Nov	2003 31-Dec
Cash Flow from Savings	\$ 27,301	\$ 21,841	\$ 10,920	\$ 5,460	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,620	\$ 46,859
Cash Flow Before Financing	\$ (2,761)	\$ (3,035)	\$ (3,309)	\$ (3,972)	\$ (4,636)	\$ (5,299)	\$ (5,962)	\$ (6,626)	\$ (7,289)	\$ (7,289)	\$ (7,115)	\$ (6,942)
Including Exceeding of Savings During Construction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flow Before Financing	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)	\$ (2,761)
Net Cash Flow from Investments	\$ -	\$ (39,110)	\$ (39,110)	\$ (94,757)	\$ (94,757)	\$ (94,757)	\$ (94,757)	\$ (94,757)	\$ (94,757)	\$ -	\$ -	\$ -
Cash Flow From Financing	\$ -	\$ 27,377	\$ 27,377	\$ 66,330	\$ 66,330	\$ 66,330	\$ 66,330	\$ 66,330	\$ 66,330	\$ -	\$ -	\$ -
Loan Disbursement	\$ -	\$ 11,733	\$ 11,733	\$ 28,427	\$ 28,427	\$ 28,427	\$ 28,427	\$ 28,427	\$ 28,427	\$ -	\$ -	\$ -
Project Sponsor's Contribution	\$ -	\$ 11,733	\$ 11,733	\$ 28,427	\$ 28,427	\$ 28,427	\$ 28,427	\$ 28,427	\$ 28,427	\$ -	\$ -	\$ -
Including Contribution in Construction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Principal	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (17,354)	\$ (17,354)
Repayment of other long-term debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flow from Financing	\$ -	\$ 39,110	\$ 39,110	\$ 94,757	\$ 94,757	\$ 94,757	\$ 94,757	\$ 94,757	\$ 94,757	\$ (17,354)	\$ (17,354)	\$ (17,354)
Increase (Decrease) in Cash	\$ 24,540	\$ 18,806	\$ 7,611	\$ 1,488	\$ (4,636)	\$ (5,299)	\$ (5,962)	\$ (6,626)	\$ (7,289)	\$ (9,023)	\$ 22,390	\$ 38,183
Cash, Beginning of Month	\$ 35,397	\$ 59,937	\$ 78,743	\$ 86,354	\$ 87,842	\$ 83,206	\$ 77,907	\$ 71,945	\$ 65,320	\$ 58,031	\$ 49,007	\$ 71,397
Cash, End of Month	\$ 59,937	\$ 78,743	\$ 86,354	\$ 87,842	\$ 83,206	\$ 77,907	\$ 71,945	\$ 65,320	\$ 58,031	\$ 49,007	\$ 71,397	\$ 109,580

Monthly Project Cash Flow												
(US Dollars)	2004 31-Jan	2004 28-Feb	2004 31-Mar	2004 30-Apr	2004 31-May	2004 30-Jun	2004 31-Jul	2004 31-Aug	2004 30-Sep	2004 31-Oct	2004 30-Nov	2004 31-Dec
Cash Flow from Savings	\$ 78,099	\$ 62,479	\$ 31,239	\$ 15,620	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,620	\$ 46,859
Cash Flow Before Financing	\$ (6,768)	\$ (6,595)	\$ (6,421)	\$ (6,248)	\$ (6,074)	\$ (5,900)	\$ (5,727)	\$ (5,553)	\$ (5,380)	\$ (5,206)	\$ (5,033)	\$ (4,859)
Including Exceeding of Savings During Construction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flow Before Financing	\$ (6,768)	\$ (6,595)	\$ (6,421)	\$ (6,248)	\$ (6,074)	\$ (5,900)	\$ (5,727)	\$ (5,553)	\$ (5,380)	\$ (5,206)	\$ (5,033)	\$ (4,859)
Net Cash Flow from Investments	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Flow From Financing	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Loan Disbursement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Project Sponsor's Contribution	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Including Contribution in Construction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Principal	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)
Repayment of other long-term debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flow from Financing	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)	\$ (17,354)
Increase (Decrease) in Cash	\$ 53,976	\$ 38,530	\$ 7,464	\$ (7,982)	\$ (23,428)	\$ (23,255)	\$ (23,081)	\$ (22,908)	\$ (22,734)	\$ (6,941)	\$ 24,472	\$ 40,265
Cash, Beginning of Month	\$ 109,580	\$ 163,556	\$ 202,086	\$ 209,550	\$ 201,568	\$ 178,140	\$ 154,885	\$ 131,804	\$ 108,896	\$ 86,162	\$ 79,221	\$ 103,693
Cash, End of Month	\$ 163,556	\$ 202,086	\$ 209,550	\$ 201,568	\$ 178,140	\$ 154,885	\$ 131,804	\$ 108,896	\$ 86,162	\$ 79,221	\$ 103,693	\$ 143,958

7 Risks Analysis

7.1 Sponsor's Risk

The project sponsor's risk is extremely important for the decision on financing the project. Usually the sponsor's risk is considered in the strong correlation with sponsor's creditworthiness, which makes sense.

The comprehensive analysis of the risks related to different revenue sources and expense items of the Slobozia budget and financial position and performance of Urban is beyond the scope of this work. Nevertheless, the sections 2 and 3 provide the disclosure of the Municipality and Urban financial statements for last three years, which demonstrate reasonable assets to secure the debt financing.

Speaking of the municipal budget, one may assume that the risks of adverse changes to the corporate and personal property taxes should be relatively low, and risks related to the timely transfers of heat subsidies are moderate. There is some uncertainty with the risks related to the municipal share of the individual income tax primarily due to inconsistent forecasts of unemployment level in the region and in to some extent due to introduction of the Global Income Tax system. However, positive signs of the stabilization of the economic activities in the city mentioned in 2.1 make these risks less alarming. The main conclusion is that with the beginning of the project implementation and savings in energy subsidies, the city budget will have a significant amount of funds freed up, not only enough to back up debt guarantee but to ensure the debt service (if the council decides to take the loan).

The most important risks from Urban are related to the issue of customer retention described above and mainly caused by increasing cost of fuel. Switching from the dependence on heat bought from Amonil to own generation gives the company an opportunity to resolve major operational problems by increasing efficiency and simultaneously providing better level of comfort for residents, which should address the retention issue. As a regulated public service utility, Urban can stabilize sales and show sustainable financial position at the end of the construction period, if the company demonstrates through the project implementation it will achieve the following goals:

- Increase of the quality of services provided to customers;
- Reduction of the operating costs;
- Improvement in financial and managerial accounting and financial planning.

In a sense, the very goal of the proposed project is to increase efficiency of district heating system in Slobozia and therefore to address the risks related to Urban performance.

Finally, two additional important considerations, which substantially ameliorate the sponsor's risk, should be noted. First, the financial schemes presented in the section 5 provide the security of the loan through the recourse on the project cash flow. Second, the detailed project cash flow analysis on monthly basis before maturity demonstrates the strong financial viability of the project, and the information presented below just confirm high robustness of the project under different circumstances relating to the project implementation. Furthermore, the project robustness and ability not only the service debt but also to generate additional cash for other district heating needs, give a reasonable assurance to consider the project sponsor's risk as irrelevant.

7.2 Heat Tariff Policy Changes

The section 3 includes the description of the cost and expenses included in heat tariff and the setting procedure in Romania. The section 5 proposes two legal options for the approval heat tariffs by ANRE on the level for the capture of saving and return of investment including debt servicing. It is obvious that the energy efficiency project does not have any chance if authorities cannot guarantee the level of tariffs for the savings utilization.

Thus, the risk of tariff policy changes will be eliminated before the beginning of the project implementation.

7.3 Completion Risk

The completion risk includes

- Cost-overflow risk;
- Start up delay (time-delay) risk;
- Approval and regulatory risk.

Cost-overflow risk includes any project risk running over budget. It is important to note that proposed technical solutions and technologies are well-known worldwide. However, this scenario tests an impact of technical and price contingencies on the project financial indicator. The technical contingency in the amount of 3% covers the cost of additional equipment or other costs that would result from a more design of a definitive project at an actual site. The proposed price contingency of 8% covers the cost of the well-know equipment that would effect from changes on the Romanian market, which is not stable because of the economy in the transition.

The results of analysis given in Figure 7-1 show that the proposed technical and price contingencies do not considerably change promising capital budgeting indicators of the project: the IRR exceeds 30%, the NPV is US\$ 718 K, and the payback period is 4.1 years.

Figure 7-1. Cost-Overflow Sensitivity

	IRR (%)	Change (%)	NPV (US\$)	Change (US\$)	Payback Period (Years)	Change (Years)
Total Project	30.2%	3.0%	718,239	75,781	4.09	0.26

Start up delay risk is very important for all projects and very important for the proposed measures, which must be finished before the beginning of the heating season. Otherwise the potential savings will be lost.

This risk has been mitigated by the proposed use of well-known technologies and the proposed month-by-month schedule for the equipment installation over two years. The risk is also mitigated by the proposed turn-key contract and including in the contract adequate incentives for the contractor to complete the work on time.

However, in order to assess the impact of the start up delay on the project financial indicators, this scenario assumes that the rehabilitation of the network 8 will not be finished in September 2002 before the heating season 2002/2003, and the operation of new facilities will be started on January 1, 2003 after three-month delay. The same three-month delay was assumed for networks 4 and 7, and therefore, these networks will provide expected savings in January 2004. The cash flow analysis indicated that it would require additional working capital in the amount of US\$ 7K in December

2003, and in the amount of US\$ 37 K in August-October 2004. However, savings in following January 2003 and November and December 2004, respectively, provide not only debt service, but also return the working capital and give a cash surplus.

Figure 7-2. Start Up Delay Sensitivity

	IRR (%)	Change (%)	NPV (US\$)	Change (US\$)	Payback Period (Years)	Change (Years)
Total Project	28.9%	4.2%	679,664	114,357	3.98	0.15

In addition, cash flow analysis shows (Figure 7-2) that the start up delay does not deteriorate substantially capital budgeting indicators. The IRR is 29%, the NPV is UD\$ 680 K, and the payback period is 4.0 years. Therefore, under the start up delay scenario the project is financially still viable.

Approval and regulatory risk. Most approval and permits have to be provided by the local authorities, who are interested in the fast project development (see section 9). Therefore, the approval procedures are not expected to be troublesome or represent a major risk.

7.4 Operating Risk

The operating risk is the possibility that the savings are lower than expected due to operational failure or project mismanagement. The risk could be significant if measures are not taken to ensure that the project is properly implemented and operated. Although Urban has a considerable experience in operating the district heating system and is interested in the new equipment and proper operation of it, the proposed training of technical personal is very important for this risk mitigation.

The other concern is related to the timely preparation of internal heating systems within apartment buildings for heat extraction from upgraded networks, primarily by cleaning and flushing of radiators. These internal systems are under the authority of owner associations, and Urban is not in charge for their maintenance. Once internal radiators' surfaces became covered by sediments or even clogged, it reduces amount of heat sale by Urban. This risk can and should be reduced by reaching and formalizing preliminary agreements with the Residential Associations that are connected to the networks being upgraded. The preparation work should be incorporated into the project implementation schedule.

The scenario tests the project results if savings of all proposed measures are lower than assumed in the base scenario by 20% over the evaluation period. The monthly cash flow analysis shows that even substantial decrease in savings over the evaluation period requires only small additional working capital in the amount of US\$ 8 K and US\$ 16 K in October 2004 and September-October 2005, respectively. However, the project still generates considerable cash not only to serve the debts but also to provide not only debt service, but also return the working capital in one month and give a cash surplus for other urgent district heating needs.

The results of this scenario are given in Figure 7-3. Although the savings decrease by 20%, and this changes the capital budgeting indicators, they still look attractive for investment: the IRR is 25%, the NPV is US\$ 444 K, and the payback period is 4.7 years.

Figure 7-3. Results of Reduced Savings Sensitivity

	IRR (%)	Change (%)	NPV (US\$)	Change (US\$)	Payback Period (Years)	Change (Years)
Total Project	25.2%	7.9%	443,836	350,184	4.67	0.83

Therefore, the conservative assumption of the considerable decrease of estimated saving by 20% demonstrates the project robustness.

7.5 The Worst Case Development

This worst project scenario tests the project cost overrun by 6%, the consequences of start up delay and low savings due to both operational failure and decrease of fuel prices. The scenario assumes the start up delay of one month, which means that the network 8 will start providing savings from November 1, 2003, and networks 4 and 7 – from November 1, 2004.

Additionally, the scenario includes decrease of energy savings by 10% due to operational failure or project mismanagement over the project evaluation period.

However, the results of the worst-case scenario presented in Figure 7-4 demonstrate the project robustness even under these circumstances. The cash flow analysis shows the IRR of 27%, the NPV of US\$ 568 K and the payback period of 4.3 years.

Figure 7-4. The Worst Case Sensitivity

	IRR (%)	Change (%)	NPV (US\$)	Change (US\$)	Payback Period (Years)	Change (Years)
Total Project	27.4%	5.8%	568,409	225,611	4.31	0.48

Therefore, the results of this worst case as well as other scenarios lead to the conclusions that the project has a reasonable financial viability, sustainable to the development and attractive for investments.

8 Expected Project Benefits

8.1 Project Benefits

Upgrade of three central heating substations at main Amonil heating system with their secondary networks into 15 local systems served by 15 local boiler houses provides various benefits for the city economy and population. In addition to the main goal of improving of reliability, operating efficiency and quality of service for these 3 upgraded districts, these supplementary benefits will include:

- Improvement of service quality for users connected to remaining 8 CHSS and still receiving heat from Amonil. Removing of 3 CHSS from the main networks means that more heat would be available for mentioned 8 ones.
- Reduced long-term cost of heat supply;
- Significant environmental improvements, mainly reductions in emissions of SO₂, NO_x and greenhouse gases (CO₂) from the boiler stacks;
- Technology transfer;
- Management capacity building.

The most significant benefit is revenue that will be generated by the project after the loan repayment. Project monetary savings are large due to the extensive operating efficiency improvements. This revenue can be used by the municipality and Urban to fund re-investment into upgrade of next substation(s) with secondary network(s). This alternative eventually leads to upgrade of all 11 CHSS with local networks with a relatively small investment, i.e., savings from the initial 3 systems upgrades funds the phased upgrade of the remaining 8 systems.

Indeed, as was noted before, this project can become the first stage of a comprehensive program of municipal infrastructure rehabilitation. Detailed analysis and development of such program require additional local input in terms of social and political decision making and, in any case, are beyond the scope of the project. Nevertheless, this section of pre-feasibility study briefly addresses most likely options that Slobozia leaders will have, as well as some additional benefits to be derived from the project.

8.2 Environmental Improvements

The relevant environmental issues for such type of projects are:

Local: Air quality, smog formation and occupational health. Emissions from boiler stacks, which might contain NO_x, CO, and even some particulate matters, disperse in the atmosphere and increase the concentration of these substances in the air at ground level, which affects the health of population at nearby areas. In the summer some substances contribute to the formation of low-level ozone; the last is irritating and harmful being in high concentrations.

Regional: Acid rains caused by the emission of NO_x,

Global:

- Emission of greenhouse gases, mainly CO₂ from the boiler stacks,

- Use for production of insulation foam (PUR with CFC or HCFC) of some substances causing ozone depletion.

Environmental Impact from Construction

This pre-feasibility study presumes that no ozone depleting substances would be used in new construction materials. The following issues require special attention during the project implementation:

In the phase of construction scrap and waste will be generated. This scrap and waste must be disposed of in a safe and environmentally responsible way, including recycling to the maximum possible degree. Environmental management plan for the implementation of the project should be developed.

Environmental aspects should be taken into account in procurement of new equipment and construction materials, primary related to the insulation. Application of asbestos insulation or PUR-insulation that have to be blown with CFC or HCFC is not acceptable.

Fuel, Water, and Electricity Consumption Decrease and Emission Reductions

The Figure 8-1 shows the current level of emissions from the thirteen selected systems and environmental impact of proposed measures.

Figure 8-1. Summary of the Project Environmental Impact and Air Emission Reductions

CHSS	Before Implementation			After Implementation			Savings	
	Heat Generation (GJ/yr)	CO ₂ (kg/yr)	NO _x (kg/yr)	Heat Generation (GJ/yr)	CO ₂ (kg/yr)	NO _x (kg/yr)	CO ₂ (kg/yr)	NO _x (kg/yr)
8	4431.87	22159.37	576.14	1571.31	7856.54	102.14	14302.83	474.01
7	4895.29	24476.47	636.39	1741.23	8706.16	113.18	15770.32	523.21
4	3008.80	15043.99	391.14	905.69	4528.45	58.87	10515.54	332.27

Implementation of the proposed project should yield considerable environmental benefits due to reduction of atmospheric emissions. The consumption of natural gas by heat-only-boilers for the same customer service level will be significantly reduced, since the project will lead to reduction of losses in heat generation, transmission and distribution. The proposed project creates absolute reduction in fuel consumption and alleviation of water losses in the district heating system.

8.3 Technology Transfer

With the implementation of the project, not only Urban but also the municipality will benefit from the introduction of advance technologies in Slobozia district heating systems. The newest technologies will have a demonstration effect and should positively affect the level, quality and technological culture of operation and maintenance performed by the local personnel, improve its morale and attitude toward the service, increase technical performance by Urban and municipality service departments.

Furthermore, technical, economic, and financial approaches applied at this project development present high potential for replication at other municipal heating systems in Romania. District heating systems in Slobozia originating from remote heat source is rather common arrangement for Romania; there is significant number of the cities in Romania with similar kind of supply. Technical and economic analysis carried-out by Electrotek confirmed the advantages of local generation, under

recently increased cost of the fuel. Furthermore, analysis of reported data and visual observations confirm some success of Urban's management efforts in keeping the systems in best operational shape. Nevertheless, within the frame of current project decent payback of 3.3 years for the project as whole is achieved. For cities with more deteriorated district heating systems assets the payback for the similar measures would be even shorter.

9 Necessary Approvals and Permits

Information on the appropriate procedures to obtain permits, approvals and other necessary for the project implementation, which is presented below, is wholly and entirely based on the statements made during interviews with the representatives of Slobozia municipality and Urban. The limited scope of the work on the pre-feasibility study prevented Electrotek team from conducting independent verification of this information, let alone general legal analysis of the regulations and legislation involved. This task may and should be performed during the preparation of the full business plan for the project.

9.1 State and County Level Approvals

Figure 9-1. State and County Permits and Approval Necessary for the Project Implementation

Permit or Approval	Who Should Apply	Who Has Authority to Issue	Steps to Take and Conditions to Meet	Relevant Legal Acts and Normative Documents
Financial and economic permits				
Endorsement for municipal guarantee of the loan by the national government	The mayor	Ministry of Finance	Develop feasibility study	Budget law for the year
Technical and economic approval for the investment project	City and County Councils	Local governments cannot initiate any investment of more than 100 million Lei without the technical approval of the Ministry of Finance (even if the city intends to fully fund the investment). If the investment exceeds some higher level, it must also be examined by the Interagency Committee for Public Works, chaired by the representative of the Ministry of Public Works, and then approved by the Government.	<ol style="list-style-type: none"> 1. Before presentation of a project to the Ministry of Finance and, if needed, Ministry of Public Works, the City or County Council, along with the public service utility must have already prepared the project concept, the pre-feasibility study and the feasibility study. 2. A series of approvals and permissions is required, which may include: urban planning, territorial planning, Ministry of Agriculture, Forestry Department, power supply availability and power utility route approval, transport utilities, gas and oil utilities route approval, Historical Sites and Natural Monuments, Department of Water Management and Ministry of Environment. 	<p>Law # 76/2000 Law # 10/1991, as amended by the Law # 72/1996</p> <p>The elements to be included in the feasibility documentation are defined in the joint order of the Ministry of Finance and the Ministry of Public Works # 1743/69/N1996, published in the Official Gazette #232bis of September 26, 1996</p>
Environmental permits				
County environmental permit	Urban	Ialomita County Inspectorat for Environment Protection (county level)	<ol style="list-style-type: none"> 1. Fill the application form 2. Provide document regarding the land ownership 3. Sign and provide a water supply contract 4. Sign and provide a waste storage and neutralization contract 5. Obtain sanitary authorization 6. Present a list of properly trained personnel 	Law #137/1995

9.2 Municipal Level Approvals

Figure 9-2. Local Permits and Approval Necessary for the Project Implementation

Permit or Approval	Who Should Apply	Who Has Authority to Issue	Steps to Take and Conditions to Meet	Relevant Legal Acts and Normative Documents
Financial permits				
Approval for the municipal loan guarantee	The mayor	City Council	<ol style="list-style-type: none"> 1. Offer legislative initiative of the mayor 2. Obtain endorsement by the Ministry of Finance 3. Pass the City Council decision 	Law # 69/1991 plus budget law for the year
Construction permits				
Different construction permits	Urban	Slobozia City Hall	<ol style="list-style-type: none"> 1. Get <i>Urbanism certificate</i> 2. Receive approvals in principle 3. Sign necessary agreements 	Proof of the legal status of the land Technical project Permissions from Conel, Romtelecom, and other affected companies or organizations.
Zoning permits				
Not needed				
Environmental permits				
Not needed				

10 Conclusions

10.1 General Findings

Even under today's difficult economic conditions for municipalities and municipal public service utilities, the project financial indicators are promising under most circumstances and attractive for the commercial financing of a district heating rehabilitation project. There are many reasons why the Municipality and Urban should go ahead with project implementation. Project benefits are significant and will lead to more cost-effective heat supply in the future, greater comfort in residential buildings, and more modern heat supply infrastructure.

10.2 Recommended Next Steps

Step 1: Approve Project Technical, Organizational and Financial Schemes

- First, the Municipality will need to make a decision on the proposed technical measures.
- Next, the Municipality and Urban will need to make a decision on the project sponsor.
- Urban will need to negotiate with ANRE the tariff level for return of investments.
- The project sponsor will need to select a scheme for project financing.

Step 2: Market Project to Lenders

- The project sponsors should market the project to lenders.
- The project sponsor should negotiate terms and conditions of financing including the loan security package.
- The project sponsors should and clarify requirements to loan documentation.

Step 3: Secure Project Financing

- The Municipality should be ready to provide guarantees of the loan repayment, which can include pledged collateral and an escrow account.
- The Municipality should take into account that increased municipal contributions to the project financing will make loan approval much easier.
- Once lending institutions have reviewed the project proposals presented in the pre-feasibility study and made their decision, the Municipality will then know which terms and conditions of project financing are available.
- The Municipality and Urban must then evaluate the various financing options that are available and select the source that best meets the needs of the project.
- The Urban must get ANRE approval on the level of tariffs for the investment return and the tariff adjustment procedure for the exchange rate changes.

Step 4: Detailed Business Plan and Other Loan Documentation

- The project sponsor should finalize the project technical design and preparation of the final detailed schedule for the project implementation.

- The project sponsor will need to prepare loan documents including detailed business plan utilizing the pre-feasibility study and results of negotiations with lenders.

Step 5: Establish Project Management Committee and Assign Responsibilities for Project Implementation

In this step, the various parties involved with the project are assigned responsibilities for carrying out the different tasks involved.

- First, a Project Management Committee, comprised of key staff of the institutions involved in the project, is formed. These institutions include the Municipality and Urban (technical and financial staff). Preferably, this Project Management Committee is kept to a small number of members, to facilitate efficient decision-making, project management and delegation of implementation-related tasks. The Municipality may also wish to appoint a Technical Advisor, who is highly knowledgeable of the technical aspects of the project, to this committee.
- Equally important is the identification of lower-level staff within each of these organizations that can carry out day-to-day tasks related to project implementation. Technical and financial staff from the Municipality and Urban will be key to successful project implementation.
- Last, specific tasks or functions required to implement the project are identified and delegated to the designated lower-level staff as appropriate. This staff keeps the Project Management Committee apprised of their progress and also relies on the committee for support when problems arise.

Step 6. Specify, Procure and Install Equipment

In this stage of the project, the specific goals are to: (1) minimize the cost; (2) minimize the disruption to end-users; (3) minimize the interruption of service; and (4) maximize the quality of the installation. The following process is typically used:

- First, detailed specifications are drawn up that describe the specific equipment needs and technical modifications associated with the project. Most likely, the targeted buildings and facilities will need to be audited in order to obtain the detail necessary for the specification.
- Based on these specifications, specific vendors are identified that can meet the needs of the project in terms of both the quality and cost of their product. At a minimum, at least two vendors per type of equipment are desired. Also, local vendors are strongly preferred, so that they can continue to maintain and repair the equipment as needed.
- Next, a competitive bid (tendering) process is used to identify the lowest-cost bidder whose product quality is still acceptable.
- Following this, a schedule is drawn up for installing the equipment. It is recommended that a phased approach be used. Equipment and measures should be installed in a limited number of buildings and facilities first, in order to identify and adjust for any modifications that are needed. After this is done, the balance of the installations should be scheduled so that the equipment is in place and working properly by the start of the heating season.
- Next, the equipment is installed, commissioned and tested. Typically, local or regional vendors are used in this step to guarantee high-quality results and provide some warranty for the work in the event problems arise.

Some vendors provide up to a twelve-month warranty on their work. As part of this warranty, they continuously monitor and verify energy savings, which provides valuable input into Step 7 (Monitor and Verify Energy Cost Savings). In addition, in order to ensure efficient work of the new equipment, some improvements have to be made at the end-user level even before the installation:

- The Municipality should reach agreement with owner associations on flushing and cleaning internal heating networks inside the buildings connected to networks proposed for upgrade. Presently these buildings are not ready to accept space heating, as pipes and radiators are clogged with sediments. Even highest energy efficiency achieved within DH networks wouldn't make any difference for inhabitants, if internal systems were not properly maintained.
- The second agreement, which should be reached between the Municipality and owner associations, is related to location of plate heat exchangers for DHW preparation for connected buildings. Secured spaces should be allocated inside the buildings (in basements or under stairwells) for these plate heat exchangers, which in a future would become sections of individual heating substations. Dedicated DH personal should have around-the-clock access to this equipment. Only with such arrangement the maximum energy efficiency at the demand side can be achieved.

Step 7: Monitor and Verify Energy Cost Savings

Monitoring and verification (M&V) of energy cost savings is needed to document the project cash flow and to identify the amount (in ROL and hard currency equivalent) that should be allocated to the special escrow account for the project and two other accounts for the investment fund and the purchase and additional fuel. It also helps to ensure the persistence of savings under the project.

- First, an M&V plan is drawn up, which outlines the specific methods that will be used for each ECO to monitor and verify energy and cost savings. This plan also identifies monitoring equipment (such as data loggers) that is needed, and assigns M&V tasks to specific members of the Project Management and project implementation team.
- Second, specific M&V activities are assigned and carried out on a regular basis. Savings for specific measures should be verified on a monthly basis during the first year of the project and less often (every 3 months) afterwards. Energy savings information and data should be forwarded to designated financial staff, so they can calculate energy cost savings due to the project.
- Third, accounting and financial staff should improve the cost and managerial accounting, allocate properly common expenses among different activities, and to keep accounting by activities.
- To ensure persistence of energy savings, appropriate training and education are provided to technical and financial staff of Urban.

Step 8: Provide Debt Service

This step - to pay off the loan that was taken out to implement the project - is perhaps the most important, since its result will determine the ability of the Municipality and Urban to complete DHS rehabilitation the and to originate other projects in the future.

- The energy cost savings due to the project is calculated from the energy savings data computed in Step 7.
- Depending on the financing approach that is used, the Municipality may choose or be required to set aside this amount in a special escrow account to provide for debt service. Alternatively, the debt service amount may be derived from other financial sources.

Extra savings after debt service might be used for

- Investments in other district heating facilities;
- Increase in heating and hot water supply for all consumers;

- Providing a comfort level approaching Western standards.

Step 9: Ensure Further Rehabilitation of the District Heating System

Future rehabilitation of other DHS facilities requires the following actions:

1. Keep DH system equipment in operational shape. Even under optimistic scenario, upgrade of entire heating system in the city can be made in several years; during this time some heat supply from Amonil still would be needed. Hopefully at this time Amonil would stay in business and be able provide this service, so under significantly increased tariff. For this optimistic scenario Urban should maintain the equipment of remaining CHSS and piping system.
2. Develop emergency heat supply program. Under pessimistic for Amonil scenario, i.e. they are not successful in competition; the heat supply could be terminated in any time. Urban should be prepared to such situation, which might be done by: a) preparation of the program of interconnection of DH network with the own BH, in order to have at least some minimum supply for all users, and/or b) purchase mobile skid-mounted boiler house(s), which can be brought and connected to any section of DH network if such urgent need emerged.

11 Informational Attachments

Figure A. Members of the Ialomita County Council

#	Name	Position	Political Affiliation	Commission
1	Savu Gheorghe	President of the Council	PDSR	B, D
2	Cana Gheorghe	Vice-President of the Council	PDSR	B, C
3	Hanaru Ioan	Vice-President of the Council	PDSR	E
4	Filipoiu Adrian Marius	Member of the Permanent Delegation	PDSR	D
5	Nica Viorel	Member of the Permanent Delegation	PDSR	E
6	Chelbea Aurel	Member of the Permanent Delegation	PDSR	C
7	Radu Constantin	Member of the Permanent Delegation	PRM	C
8	Cojocaru Ion Valentin	Member of the Permanent Delegation	PSDR	A
9	Manache Gheorghe	Member of the Permanent Delegation	PUNR	B
10	Pacala Elena	Council member	PDSR	D
11	Neidoni Sabin	Council member	PDSR	D
12	Cojocaru Neculai	Council member	PDSR	A
13	Anghel Cornel	Council member	PDSR	E
14	Stanoiu Dumitru	Council member	PDSR	B
15	Gaidanov Petre	Council member	PDSR	A
16	Petcu Olga	Council member	PDSR	E
17	Stamate Neculai	Council member	PDSR	E
18	Ionescu Constantin	Council member	PDSR	A
19	Zaharia Iulian	Council member	PD	B
20	Negoita Constantin	Council member	PD	E
21	Popa Constantin	Council member	PD	E
22	Marinescu Catalin	Council member	PD	A
23	Grigore Ion	Council member	PD	D
24	Tont Gheorghe	Council member	APR	A
25	Carniciu Gheorghe	Council member	APR	B
26	Gaina Mihaita	Council member	APR	A
27	Gherman Florin	Council member	PNL	B
28	Caraiola Dimciu	Council member	PNL	E
29	Olaru Vasile	Council member	PNL	D
30	Man Octavian	Council member	CDR	C
31	Zdrincu George	Council member	CDR	A
32	Pana Adriana	Council member	CDR	D
33	Boboc Alexe	Council member	PRM	A
34	Marin Gheorghe	Council member	PRM	A
35	Neacsu Marian	Council member	PSDR	B
36	Vasile Mitu	Council member	PSDR	C
37	Martinescu Petrisor	Council member	PUNR	E

County Council Commissions : A - Legal and public administration commission; B - Budget, finance, studies, social-economic prognoses and local development commission; C - Commission on education, religion and child rights protection; D - Commission of health and social assistance, culture, monuments preservation,

leisure and sports; E - Commission on urban issues, public works, private and public property administration, and environmental protection.

Figure B. Members of the Slobozia City Council

#	Name	Occupation	Political Affiliation	Commission
1	Anăstăsoai Gheorghe	Engineer	PDSR	A
2	Chiru Ion	Economist	PDSR	B (President)
3	Constantinescu Emil	Engineer	PUR	A (Secretary)
4	Cretu Nicolae	Engineer	PDSR	C
5	Dobrinescu Eliad	Maestro	PDSR	C
6	Drăghici Dumitru	Engineer	PDSR	E
7	Gherman Florin	Engineer	CDR	A
8	Ionescu Nicolae	Veterinarian	PDR	C (President)
9	Ionescu Nicolae	Economist	PSM	C (Secretary)
10	Ionitã Ion	Engineer	USD	B (Secretary)
11	Isdrãilã Ion	Engineer	CDR	B
12	Leancu Gabriel	Veterinarian	CDR	C
13	Mihai Emilian	Engineer	PAC	B
14	Nica Ion	Economist	PS	D
15	Nutã Gheorghe	Engineer	CDR	B
16	Puia Mihai	Veterinarian	PDSR	A (President)
17	Radu Constantin	Processor	PRM	D (Secretary)
18	Râncã Gheorghe	Engineer	PSM	A
19	Sãvoiu Gheorghe	Engineer	PDAR	D
20	Spireanu Laurentiu	Medic	PNA	D
21	Stancu Nicolae	Processor	PDSR	D (President)
22	Vinteanu Mihail	Lawyer	USD	E (President)
23	Zamfir Mihai	Electromechanic	CDR	E (Secretary)

City Council Commissions: **A** - the Commission for health and social assistance, culture, monuments preservation, leisure and sports; **B** - the Commission for budget, finance, studies, social-economic forecast and local development; **C** - the Commission for urban development, public works, private and public property management and environmental protection; **D** - the Commission for education, religious issues and child's rights protection; **E** - the Commission for public administration, legal issues, public order and citizens' rights.

Figure C. Full Budget Table (Revenues)

#	Romanian Lei in Thousands	1998		1999		2000	
		Final Projections	Actual	Final Projections	Actual	Final Projections	Actual
1	REVENUES - TOTAL (rows 02+69+76+85+89)	28,160,514	26,855,387	57,039,265	54,281,602	76,907,733	60,659,468
2	OWN REVENUES - TOTAL (rows 03+50+55)	11,186,000	9,380,877	30,307,265	27,294,387	33,808,824	26,275,042
3	I. CURRENT REVENUES (rows 4+32)	10,886,000	9,081,171	21,007,000	19,513,726	32,249,980	24,495,780
4	A. TAX REVENUES (row 5+25)	8,766,000	7,015,562	16,020,000	15,133,952	25,102,865	18,695,554
5	A1. DIRECT TAX (row 06+07+17+18+21)	8,296,000	6,659,217	15,300,000	14,543,033	23,902,245	17,949,929
6	INCOME TAX (from autonomous regies subordinated to the local authority)	1,000,000	74,602	150,000	112,804	0	0
7	TAX REVENUES FROM POPULATION (r 8 to 16)	3,640,000	3,028,241	8,900,000	8,325,914	9,916,274	7,546,644
8	Income tax from freelancers, artisans and other individuals, family associations	880,000	699,614	1,000,000	885,913	270,768	212,740
9	Individual property tax (tax on buildings)	400,000	141,313	3,500,000	3,212,416	5,930,641	4,547,347
10	Individual car tax (tax on cars for individuals)	500,000	210,971	700,000	610,715	1,195,618	914,659
11	Income tax from rents, sub-renting	160,000	121,830	200,000	187,829	52,025	31,373
12	Income tax on intellectual property (copy right, etc.)	0	0	0	0	0	0
13	Income tax related to awards and earnings in kind or money	360,000	395,492	0	0	0	0
14	Income tax for people not on salaries	1,240,000	1,348,778	2,200,000	2,411,336	590,274	521,109
15	Individual land property tax (tax on land)	0	0	700,000	620,014	1,778,116	1,191,315
16	Other taxes from population	100,000	110,243	600,000	397,691	98,832	128,101
17	TAX FOR STATE-OWNED LAND USE	400,000	324,038	300,000	288,990	459,031	323,253
18	CORPORATE PROPERTY TAX (BUILDINGS AND LAND) r19+20	2,400,000	2,518,026	4,500,000	4,339,858	10,067,905	6,974,796
19	Corporate building tax	2,400,000	2,518,026	4,200,000	3,978,186	8,021,260	6,112,225
20	Corporate land tax	0	0	300,000	361,672	2,046,645	862,571
21	OTHER DIRECT TAXES (r 22 to 24)	856,000	714,310	1,450,000	1,475,467	3,459,035	3,105,236
22	Car tax for corporate	550,000	480,118	850,000	933,245	2,346,144	1,583,508
23	Agriculture income tax	0	0	0	0	5,000	-1,668
24	Other revenues from direct taxes	306,000	234,192	600,000	542,222	1,107,891	1,523,396
25	A2. INDIRECT TAXES (r. 26+27)	470,000	356,345	720,000	590,919	1,200,620	745,625
26	SHOW BIZ TAX	50,000	41,711	20,000	18,510	13,720	12,633
27	OTHER INDIRECT TAXES (r. 28 to 31)	420,000	314,634	700,000	572,409	1,186,900	732,992
28	Taxes and tariffs for license issuing and operating authorization	420,000	314,634	350,000	265,821	857,279	485,312
29	Stamp taxes related to complaints	0	0	0	0	0	0
30	Extrajudicial stamp taxes	0	0	350,000	306,588	329,621	247,680
31	Other revenues from indirect taxes	0	0	0	0	0	0
32	B. NON-TAX REVENUES (row 33+34+42)	2,120,000	2,065,609	4,987,000	4,379,774	7,147,115	5,800,226
33	NET PROFIT CASH-IN FROM REGIES AUTONOMOUS	170,000	158,983	220,000	217,192	88,000	87,595
34	CASH-IN FROM PUBLIC INSTITUTIONS (r 35 to 41)	630,000	623,838	1,147,000	971,226	1,121,929	952,194
35	Other revenues related to transport on public roads	240,000	215,369	500,000	434,560	355,441	266,250
36	Revenues from public services for plants profilaxy	0	0	0	0	0	0
37	Revenues from centers for artificial seeding	0	0	0	0	0	0
38	Revenues from sanitary-veterinary ambulatories	0	0	30,000	24,829	7,414	6,016
39	Cash-in from public institutions and self-financing activities	30,000	25,408	17,000	16,321	0	0
40	Contributions owed by persons recipients of social meals	0	0	0	0	0	0
41	Other revenues from public institutions	360,000	383,061	600,000	495,516	759,074	679,928
42	MISCELLANEOUS REVENUES (r 43 to 49)	1,320,000	1,282,788	3,620,000	3,191,356	5,937,186	4,760,437
43	Revenues from recovery of expenses related to legal charges, imputations and compensations	100,000	99,203	100,000	48,597	60,579	41,180
44	Revenues from fines, penalties according to the law	10,000	6,079	10,000	6,185	36,850	19,353
45	Recovery of funds from previous years' local budget financing	10,000	6,124	10,000	9,965	0	5,679
46	Revenues form concession and renting activities	1,000,000	1,025,410	3,300,000	2,954,974	5,515,996	4,487,966
47	Cash-in from confiscated goods sale	0	0	0	0	0	0
48	Revenues from managing the assets of the former agriculture production co-operatives	0	0	0	0	0	0
49	Cash-in form other sources	200,000	145,972	200,000	171,635	323,761	206,259

Pre-Feasibility Study for Slobozia Municipal Energy Efficiency Project

#	Romanian Lei in Thousands	1998		1999		2000	
		Final Projections	Actual	Final Projections	Actual	Final Projections	Actual
50	II. REVENUES FROM EQUITY (r. 51)	300,000	299,706	5,098,000	5,087,675	681,344	793,097
51	REVENUES FROM STATE GOODS' SALE (r 52 to 54)	300,000	299,706	5,098,000	5,087,675	681,344	793,097
52	Revenues from sale of public institutions' goods	0	0	0	0	0	0
53	Revenues from sale of dwellings built by the state	300,000	299,146	500,000	489,559	288,484	361,240
54	Revenues from privatization	0	560	4,598,000	4,598,116	392,860	431,857
55	III. REVENUES WITH SPECIAL DESTINATION (r. 56)	0	0	4,202,265	2,692,986	877,500	986,165
56	REVENUES WITH SPECIAL DESTINATION (r.57 to 68)	0	0	4,202,265	2,692,986	877,500	986,165
57	Special taxes	0	0	0	0	0	0
58	Revenues from private goods sale	0	0	367,700	417,965	0	0
59	Revenues from funds for public roads	0	0	0	0	0	0
60	Revenues from the intervention fund	0	0	0	0	0	0
61	Revenues from the dwellings fund	0	0	3,824,565	2,239,961	827,500	975,365
62	Revenues from fixed assets amortization	0	0	0	0	0	0
63	Revenues from the civil aircraft fund	0	0	0	0	0	0
64	Donations and sponsorships	0	0	10,000	35,060	50,000	10,800
65	Contributions of legal persons and individuals to take part in funding of public interest actions	0	0	0	0	0	0
66	Revenues for financing the program devoted to paving communal roads and supplying water in villages	0	0	0	0	0	0
67	Revenues for financing the actions related to mitigation of earthquake risk of existent buildings, which are used as dwellings	0	0	0	0	0	0
68	Revenues from renting, selling and concession of the goods administrated by public hospitals	0	0	0	0	0	0
69	IV. REVENUES FROM STATE BUDGET (r.70+71)	6,900,000	6,900,000	18,732,000	20,376,813	40,323,909	32,366,054
70	REVENUES QUOTA FROM WAGE TAX	0	0	16,400,000	18,044,813	1,784,548	1,891,010
71	REVENUES QUOTA FROM INCOME TAX (r 72 to 75)	6,900,000	6,900,000	2,332,000	2,332,000	38,539,361	30,475,044
72	Breakdown quotas from income tax	6,900,000	6,900,000	2,332,000	2,332,000	34,964,361	27,463,338
73	Breakdown amounts from income tax for local budget balancing	0	0	0	0	1,000,000	1,000,000
74	Breakdown amounts from income tax for heat subsidizing	0	0	0	0	2,575,000	2,011,706
75	Amounts allocated by the county council for local budget balancing	0	0	0	0	0	0
76	V. SUBSIDIES (r. 77 + 81)	10,074,514	10,074,514	6,000,000	4,610,402	2,775,000	2,018,372
77	SUBSIDIES FROM STATE BUDGET (r. 78 to 80)	10,074,514	10,074,514	6,000,000	4,610,402	0	0
78	Subsidies for local budget for investments partially financed by external loans	1,374,514	1,374,514	6,000,000	4,610,402	0	0
79	Subsidies for local budget for supporting child protection system	8,700,000	8,700,000	0	0	0	0
80	Subsidies for local budget for financing the development and/or update the general urban plans and regulations	0	0	0	0	0	0
81	SUBSIDIES RECEIVED FROM OTHER BUDGETS (r. 82 through 84)	0	0	0	0	2,775,000	2,018,372
82	Subsidies from the special fund for social solidarity for handicapped people to support children's rights	0	0	0	0	536,444	409,134
83	Subsidies from the special fund for social solidarity for handicapped people to support people with handicap	0	0	0	0	2,238,556	1,609,238
84	Subsidies received from other local budgets to support the protection system of children's rights	0	0	0	0	0	0
85	VI. CASH-IN FROM GRANTED LOANS (r.86)	0	0	0	0	0	0
86	CASH-IN FROM GRANTED LOANS (r. 87)	0	0	0	0	0	0
87	Cash-in from payback of temporary loans for the establishment of public services and institutions or activities entirely financed from extrabudgetary funds	0	0	0	0	0	0
88	VII. LOANS (r. 89 + 92+94)	0	499,996	0	0	0	0
89	INVESTMENT LOANS (r. 90+91)	0	0	0	0	0	0
90	Internal loans for investments	0	0	0	0	0	0
91	External loans for investments	0	0	0	0	0	0
92	TEMPORARY LOANS (r. 93)	0	499,996	0	0	0	0
93	Temporary loans from State Treasury	0	499,996	0	0	0	0
94	LOANS FROM THE OPERATING REVOLVING FUND	0	0	0	0	0	0
	BREAKDOWN AMOUNTS FROM WAGE TAX FOR LOCAL BUDGETS	0	0	2,000,000	2,000,000	0	0

Figure D. Full Budget Table (Expenses)

#	Romanian Lei in Thousands	1998		1999		2000	
		Final Projections	Actual	Final Projections	Actual	Final Projections	Actual
95	EXPENSES - TOTAL (r. 144+153+240+268+318+335+342+351+358+386+398+404)	28,160,514	26,855,387	57,039,265	51,628,008	76,907,733	61,941,411
144	I. GENERAL PUBLIC SERVICES – TOTAL (rd152)	3,065,000	3,005,775	4,346,000	4,308,217	7,233,343	6,103,209
152	Executive authorities	3,065,000	3,005,775	4,346,000	4,308,217	7,233,343	6,103,209
153	III SOCIAL-CULTURAL EXPENDITURES – TOTAL (r. 170+185+190+214)	6,630,000	6,208,688	12,937,370	11,436,343	18,223,150	15,361,660
170	EDUCATION (r. 179 through 184)	3,710,000	3,469,205	7,385,000	7,379,783	11,338,550	10,213,216
179	Pre-school education	739,124	692,050	1,568,700	1,564,337	1,616,683	1,398,626
180	Primary and secondary education	865,010	802,974	2,203,770	2,203,685	4,427,300	3,937,817
181	High-school education	2,105,866	1,974,181	3,612,530	3,611,761	5,294,567	4,876,773
182	Professional education	0	0	0	0	0	0
183	Post- high school education	0	0	0	0	0	0
184	Boarding, hostels and canteens for student	0	0	0	0	0	0
185	HEALTH (r. 188 + 189)	250,000	214,735	300,000	211,548	400,000	400,000
188	Nurseries	0	0	0	0	0	0
189	Other institutions and health care actions	250,000	214,735	300,000	211,548	400,000	400,000
190	CULTURE, RELIGION AND ACTIONS RELATED TO SPORT AND YOUTH (r. 203 through 213)	0	0	0	0	200,000	85,800
203	Communal, city, municipal, county public libraries	0	0	0	0	0	0
204	Museums	0	0	0	0	0	0
205	Theatres and professional institutions for performances and concerts	0	0	0	0	0	0
206	Mass art schools	0	0	0	0	0	0
207	Culture houses	0	0	0	0	0	0
208	Culture houses in rural areas	0	0	0	0	0	0
209	Centers for the preservation and promotion of the folk tradition and art	0	0	0	0	0	0
210	Religion cults	0	0	0	0	0	0
211	Sports activity	0	0	0	0	0	0
212	Youth activity	0	0	0	0	0	0
213	Other institutions and actions related to culture, religion and sports and youth oriented activity	0	0	0	0	200,000	85,800
214	SOCIAL CARE, ALLOWANCES, PENSIONS, ALLOWANCES AND DAILY ALLOWANCES (r. 227 through 239)	2,670,000	2,524,748	5,252,370	3,845,012	6,284,600	4,662,644
227	Old persons hostels	0	0	0	0	1,763,600	1,438,106
228	Pilot centers for the recovery and reintegration of the minors with handicap	0	0	0	0	0	0
229	Centres for the recovery and reintegration of the minors with handicap	0	0	0	0	0	0
230	Centres for integration through occupational therapy	1,980,000	1,836,269	2,118,800	2,051,538	0	0
231	Centres for recovery and neuropsychiatric rehabilitation	0	0	0	0	0	0
232	Social care canteens	625,000	625,000	1,000,000	999,476	1,306,000	849,104
233	Social care	10,000	8,767	868,200	77,883	310,000	296,116
234	Support of the child's rights protection system	0	0	0	0	0	0
235	Birth allowances	38,400	38,267	60,000	44,673	60,000	43,274
236	Specialized public service for child's protection	0	0	0	0	0	0
237	Pensioners hostels	0	0	0	0	0	0
238	Payment due to the personal assistant for children and adults with severe handicap	0	0	0	0	2,775,000	1,980,800
239	Other actions related to social care, allowances, support and daily allowances	16,600	16,445	1,205,370	671,442	70,000	55,244
240	IV. SERVICES AND PUBLIC DEVELOPMENT, DWELLINGS, ENVIRONMENT AND WATER (r. 241)	17,424,514	16,606,719	35,191,830	32,913,067	49,772,180	39,688,715
241	SERVICES AND PUBLIC DEVELOPMENT AND DWELLINGS (r. 256 through 267)	17,424,514	16,606,719	35,191,830	32,913,067	49,772,180	39,688,715
256	Street maintenance and repair	1,982,682	1,631,611	6,245,260	6,236,522	14,932,107	11,191,964
257	Lighting	800,000	797,002	827,380	817,395	1,385,300	1,283,147
258	Cleaning	826,366	724,816	1,024,086	1,024,000	2,831,239	2,400,427
259	Parks, public gardens and leisure areas maintenance	1,992,390	1,905,932	1,708,491	1,706,796	3,375,895	2,952,706
260	Dwellings	1,374,514	1,374,514	367,700	0	400,000	104,917
261	Water supply, treatment stations, pumping stations	3,662,512	3,662,053	1,444,243	1,435,553	1,683,000	770,629
262	Networks, boiler houses, substations	3,733,939	3,733,921	19,934,943	18,212,926	13,655,500	11,125,322
263	Sewage	0	0	105,942	105,916	1,088,000	946,627
264	Local interest hydraulic works, inside the municipality	0	0	0	0	0	0
265	Introduction of natural gas in municipalities	600,200	599,842	577,000	550,114	3,522,000	3,154,419
266	Rural electrification	0	0	0	0	0	0
267	Other actions for public and dwellings development	2,451,911	2,177,028	2,956,785	2,823,845	6,899,139	5,758,557
268	V. ECONOMIC ACTIONS (r. 282 + 292 + 310)	0	0	132,000	131,838	56,500	50,377
282	AGRICULTURE AND FORESTS (r. 289 through 291)	0	0	132,000	131,838	56,500	50,377
289	Fight against plants diseases - Local centers for plants protection	0	0	0	0	0	0
290	Centers for artificial seeding	0	0	0	0	0	0
291	Sanitary-veterinary ambulatories	0	0	132,000	131,838	56,500	50,377

Pre-Feasibility Study for Slobozia Municipal Energy Efficiency Project

##	Romanian Lei in Thousands	1998		1999		2000	
		Final Projections	Actual	Final Projections	Actual	Final Projections	Actual
292	TRANSPORT AND COMMUNICATIONS (r. 306 through 309)	0	0	0	0	0	0
306	Civil aviation	0	0	0	0	0	0
307	Roads and bridges	0	0	0	0	0	0
308	Public transportation	0	0	0	0	0	0
309	Other expenses in the field of transport and communications	0	0	0	0	0	0
310	OTHER ECONOMIC ACTIONS (r. 316 + 317)	0	0	0	0	0	0
316	Prevent and elimination of floods and frost	0	0	0	0	0	0
317	Other expenditures for economic actions	0	0	0	0	0	0
318	VI. OTHER ACTIONS (r. 319)	10,000	5,755	75,000	66,434	681,000	678,774
319	OTHER ACTIONS (r. 330 through 334)	10,000	5,755	75,000	66,434	681,000	678,774
330	Military commandments	0	0	0	0	0	0
331	Civil protection	0	0	0	0	0	0
332	Romanian Social Development Fund	0	0	0	0	0	0
333	Regional Development Fund	0	0	0	0	0	0
334	Other expenditures	10,000	5,755	75,000	66,434	681,000	678,774
335	VII. GUARANTEE FUNDS AND REDISTRIBUTION (r. 339)	0	0	0	0	0	0
339	REPAYMENT OF FOREIGN LOANS, INTEREST RATES AND FEES RELATED TO GUARANTEE FUNDS (r. 340+341)	0	0	0	0	0	0
340	Repayment of foreign loans	0	0	0	0	0	0
341	Payment of interest rates and fees	0	0	0	0	0	0
342							
343	VIII. TRANSFERS (r. 343)	0	0	0	0	0	0
349	TRANSFERS FROM LOCAL BUDGETS (r. 349+350)	0	0	0	0	0	0
350	Transfers from local budgets to the health fund budget	0	0	0	0	0	0
351	Transfers from the communal, city, municipal, sector of Bucharest budget to the county budget for supporting the child's protection system	0	0	0	0	0	0
356	IX. LOANS GRANTED (r.352)	0	0	0	0	0	0
358	Temporary loans for the set-up of public institutions and services of local interest or of activities fully supported from extrabudgetary revenues	0	0	0	0	0	0
368	X. PAYMENTS OF INTEREST RATES AND OTHER EXPENDITURES (r. 368 + 380)	31,000	28,669	22,500	22,500	0	0
376	INTEREST RATES RELATED TO LOCAL PUBLIC DEBT AND OTHER EXPENDITURES (r. 376 through 379)	0	0	0	0	0	0
377	Interest rates corresponding to the internal local public debt	0	0	0	0	0	0
378	Interest rates corresponding to the foreign local public debt	0	0	0	0	0	0
379	Expenditures occasioned by the issue and sale of value titles, in compliance with the law	0	0	0	0	0	0
380	Exchange rate difference corresponding to the foreign local public debt	0	0	0	0	0	0
385	PAYMENT OF INTEREST RATES (r. 385)	31,000	28,669	22,500	22,500	0	0
386	Interest rates corresponding to the loans from the treasury fund	31,000	28,669	22,500	22,500	0	0
387	XI. REPAYMENT OF LOANS (r. 387)	1,000,000	999,781	500,000	499,996	0	0
394	REPAYMENT OF GRANTED LOANS (r. 394 through 397)	1,000,000	999,781	500,000	499,996	0	0
395	Repayment of loans granted from the treasury fund	1,000,000	999,781	500,000	499,996	0	0
396	Repayment of loans granted from the state treasury fund	0	0	0	0	0	0
397	Repayment of internal investment loans	0	0	0	0	0	0
398	Repayment of foreign investment loans	0	0	0	0	0	0
403	XII. RESERVE FUNDS (r. 403)	0	0	0	0	0	0
404	Budgetary reserve fund available for local and county councils	0	0	0	0	0	0
405	XIII. EXPENDITURES WITH SPECIAL DESTINATION (r. 405)	0	0	3,834,565	2,249,613	941,560	58,676
419	SPECIAL DESTINATION EXPENDITURES (r. 419 through 431)	0	0	3,834,565	2,249,613	941,560	58,676
420	Public services financed from special taxes	0	0	0	0	0	0
421	Expenditures from the public roads fund	0	0	0	0	0	0
422	Expenditures from the intervention fund	0	0	0	0	0	0
423	Expenditures from the dwellings fund	0	0	3,824,565	2,239,613	866,500	37,999
424	Expenditures from the fixed assets depreciation	0	0	0	0	0	0
425	Expenditures from the civil aviation fund	0	0	0	0	0	0
426	Expenditures from donations and sponsorship	0	0	10,000	10,000	75,060	20,677
427	Expenditures from amounts paid by legal persons and individuals to participate in public interest actions	0	0	0	0	0	0
428	Expenditures for financing the program of paving communal roads and villages water supply	0	0	0	0	0	0
429	Expenditures for financing the activities to reduce seismic risk for existing buildings and other special measures	0	0	0	0	0	0
430	Expenditures for purchase of medical equipment for public hospitals	0	0	0	0	0	0
431	Investment expenditures from the revenues obtained from selling private property assets	0	0	0	0	0	0
	XIV. SURPLUS / DEFICIT	-	-	-	2,653,594	-	(1,281,943)

Figure E. Municipal assets available as loan collateral

Type	Description	Liquidity Value (‘000 ROL)
Building	Commercial center, Cuza Voda street	260 010
Building	Public bath room, Cuza Voda street	74 442
Building	Space for flowers sale, Unirii street	195 770
Building	Space for flowers sale, M.Basarab street	126 062
Building	Store, M.Basarab street	180 000
Building	Auxiliary building, Aleea Florilor street	155 750
Building	Central Store, M.Basarab street	900 000
Building	Agro-alimentary market, Cosminului street	765 412
Building	Agro-alimentary market, Nordului street	1 514 721
Building	Market building, Ialomitei street	2 823 008
	Total	6 995 175