



CASE STUDY: CET IASI SA

Project Name	Modernization of 3 thermal points and their secondary network
Sector	District heating
Borrower	Enterprise owned 100% by Iasi Municipality
Lender	Romanian Energy Efficiency Fund
Financing Starting Date	April 2005
Project Size/Loan Amount	USD 1,250,000 / 980,000

Summary

CET IASI SA produces power and heat using cogeneration technology. The company operates 2 combined heat and power (CHP) plants, CET I (using oil fuel) and CET II (using coal). The total installed power of the two plants is about 250 MWe. The thermal installed capacity is about 907 MWt, from which 260 MWt as steam for industrial consumers and 647 MWt as hot water for domestic consumers. The fuel consumption structure of the company is as follows: 44% natural gas, 25% fuel oil and 31% coal.

The project, partially financed by FREE by a 2-year loan, is a part of a complex project of modernization of the entire district heating system of the Iasi city. At the same time, by implementing this project the company intends to improve its services, especially those ones provided to the domestic consumers. The project will lead to reducing fuel and power consumption, thermal agent losses, maintenance and salary costs.



The Simple Payback Period of the project has been estimated at about 6 years. The project also leads to diminishing environmental pollution, especially carbon dioxide emissions, a Green House Effect Gas.

Description of the project

The project consists in modernization of 3 thermal points and their secondary network. Thermal points will be equipped with new plate heat exchangers instead of tubular ones, pumps with variable speed drivers and automation and metering system. The thermal points buildings and all electrical equipment will also be modernized. The district heating ducts will be extended for installation of the recirculation warm water pipe. All the pipes will be replaced with the new pre-insulated ones.

Aim of the project

The aim of the project is to improve the quality of services provided to the domestic consumers. Thus, the company expects to reverse the trend of number of consumers, because at the moment many customers disconnect from the central district heating system. The features of the project are presented below:

- **Cost reduction.** After project implementation it is expected that the overall costs for heat production and distribution will decrease. At the same time the quality of provided service of heat supply is expected to increase.

- **Rehabilitation of the distribution network.** All the distribution network pipes for heat and warm water will be replaced, leading to reducing heat and water losses.
- **Pollutant emissions reduction.** The reduction of fossil fuel consumption will lead to diminishing of pollutant emissions.

Economic evaluation of the project

The project will be implemented in the first part of 2005. The overall cost of the project is about USD 1,250,000. The total investment is detailed in Table 1.

Savings

The project will lead to the following savings:

- **Fuel.** Replacing the heat exchangers and pipes from the distribution network will lead to diminishing the heat losses. Thus, the company will save about 9,273 tons of coal during 2005-2011.
- **Power.** The pumps in the thermal points will be replaced with ones equipped with variable speed drivers and also having a higher efficiency, leading to electricity savings. At the same time the water flows will decrease, also leading to power savings.
- **Maintenance, salaries, etc.** The new installed equipment have a higher reliability and are completely automated. Thus, the maintenance costs will decrease, and at the same time the salary costs will also diminish.



Financial evaluation

The cash flow analysis has been performed for the next 25 years based on the energy and fuel costs in 2004 and 2005. The project evaluation has been performed using the following criteria: Simple Payback Period, Internal Rate of Return and Net Present Value calculated for an actualization rate of 12%. The financial analysis and results are presented in Table 2. The analysis has also taken into consideration the evolution of the number of domestic consumers estimated by the company.

Taking into account that the total investment is about USD 1,250,000 and considering the annual savings as presented in Table 2 the Simple Payback Period is about 6 years.



loan is for 2 years, having a grace period of 6 months. The loan reimbursement will be made on a quarter rate basis.

Financing

By implementing this pilot project the company intends to demonstrate that it can improve its services provided to the domestic consumers. The project is a part from a modernization plan of the entire central district heating system of the Iasi city.



Following these objectives the company decided to invest USD 1,250,000 for modernization of 3 thermal points and their distribution network. Being an energy efficiency project the company applied for a FREE loan of about USD 980,000 (78%), the company participation being of USD 270,000 (22%). The FREE

Expected Impact

The fuel savings generated by the project will be about 9,300 tons of coal (5,450 tep equivalent) for the period of 2005-2011. Reducing the fuel consumption will also lead to diminishing the environmental impact by reducing the emissions. The CO₂ emissions will decrease with approximately 25,500 tons for the same period of time. The sulfur dioxide, NO_x and dust emissions will also be reduced significantly.

At the same time project implementation will have a positive impact on the company's image due to improving its services provided to the domestic consumers.

Table 1

Item	USD*
TP102 Tudor Vladimirescu	575,000
Equipment and works at thermal point	70,000
Equipment and works for the distribution network	505,000
TP8 Cantemir	575,000
Equipment and works at thermal point	70,000
Equipment and works for the distribution network	505,000
TP10A Cantemir	100,000
Equipment and works at thermal point and 3 thermal modules	100,000
Total project	1,250,000

* - The figures include all import, customs taxes, etc, and do not include VAT.

Table 2

	Year										
	0	1	2	3	4	5	6	7	24	25
	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD
Initial investment	-1,250	-	-	-	-	-	-	-	-	-	-
Cash Flow	-1,250	206	203	203	206	213	221	229	...	229	229
Accumulated Cash Flow	-1,250	-1,043	-840	-637	-430	-218	3	232	...	4,129	4,358
Discount Factor	1.00	0.89	0.80	0.71	0.64	0.57	0.51	0.45	...	0.06	0.05
Present Value of the Cash Flow	-1,250	-1066	-904	-760	-629	-508	-396	-292	...	445	459
Payback Period	6	years									
Discount Payback Period	11.5	years									
Net Present Value	459	kUSD									
Internal Rate of Return	17	%									

FREE financing advantages

Main advantages of the FREE financing are:

- FREE is a unique Romanian financier in energy efficiency field;
- FREE is actively supporting the companies during the energy efficiency project analysis;
- FREE offers flexible and attractive ways to guarantee the loans;
- FREE facilitates the access of the companies for financing feasibility studies, energy audits, etc.;
- FREE offers low cost financing for companies;

FREE offers technical assistance.