CASE STUDY: DOROHOI LOCAL COUNCIL

Projects Name	Modernization of the public lighting system in Dorohoi city
Sector	Municipality
Borrower	DOROHOI Local Council, Botosani County
Lender	Romanian Energy Efficiency Fund
Financing Starting Date	July 2005
Project Size/Loan Amount	USD 267.500 / 209.000

Summary

Dorohoi city, located in Botosani County, has a population of about 34,000 inhabitants. The Local Council has decided to modernize the public lighting system, including street and ambient lighting. Presently, the street lighting is ensured by 1.356 devices.

The lighting devices used today are obsolete (being based on old technology) having a short life span, high energy consumption and not meeting all standards and norms for public lighting.

The actual lighting system has an installed capacity of 273 kW. It is important to notice that the street lighting is covering approximately 65.9% comparing to the existing palls. The maintenance costs of the public lighting system are high, especially due to short life span of the lighting devices.

By implementing the project, the Dorohoi Local Council intends to reduce the electricity bill of the Municipality and at the same time to increase the quality of the provided service. The project, which is co-financed by the Romanian Energy Efficiency Fund with 78%, generates great electricity savings. It also has a positive impact on the environment by reducing the Greenhouse Gasses emissions at the energy generating facility site.

Project description

The project consists in installing 1,500 new lighting devices on every pole in the city. The new lighting devices are high pressure sodium having a high efficiency and great lighting efficiency. The new lighting devices will have a rated power between 125 W and 400 W and will be chosen according to all the norms and standards for public lighting.

The life span of the new lighting devices is considerably longer compared to the old ones, being between 12,000 and 24,000 hours of operation. The new lighting devices are keeping their characteristics during a longer period of time, thus leading to reducing of maintenance costs and increasing the quality of lighting in the city.

The installed capacity of the modernized system is about 108 kW. The new lighting devices with installed capacities over 150 W are equipped with „dimmer" type relays, which can generate savings of up to 35%.

Aim of the project

The new public lighting system uses devices with high energy efficiency and also respects all the existing standards and norms regarding public lighting. The main advantages of the project are the following:

- **Reducing electricity consumption.** The implementation of the new public lighting system will generate electricity savings of about 60 %.
- **Reducing pollutant emissions.** Reducing the consumption of electricity leads to diminishing of pollutant emissions, especially of CO_2 emissions.
- **Positive social impact.** Increasing the quality of the public lighting service has a positive social impact.

Economic evaluation of the project

Modernization of the public lighting system will commence in the month of November 2005. The project implementation period is estimated at about 2-3 months.

The total costs of the project are USD 267.500 and are detailed in table 1.

Savings

The estimated savings after the project implementation are presented below:

- **Electricity.** Modernization of the public lighting system will lead to electricity savings of about 599 MWh per year, i.e. 65,000 USD/year.
- **Maintenance.** The installation of new lighting devices based on modern technologies will lead to decreasing of the maintenance costs. During the first 2 years the guarantee is of 100% (it is guaranteed by the project implementer), and the annual financial savings due to decrease of maintenance costs can reach about 22,500 USD. During the year 3, the project implementer covers 80% from guarantee, the annual financial savings being of about 18,000 USD; during the year 4, the project implementer covers 64% from guarantee, the annual financial savings being of about 15,000 USD. Starting with year 5, all maintenance costs should be covered by the municipality..

Financial evaluation and Financing

The feasibility evaluation of the projects has been performed using the following criteria: the simple payback period, internal rate of return and net present value calculated for an actualization rate of 12% and a study period of 20 years. Table 2 presents a synthesis of the financial analysis.

The Local Council of Dorohoi city has decided to invest USD 267,500 for implementation of the energy efficiency project. The Romanian Energy Efficiency Fund finances 78 % of the entire investment, i.e. with a credit of USD 209,000, the Local Council assuring the rest of 22%, i.e. USD 58,500 from own sources. The Romanian Energy Efficiency Fund loan is for 4 years having a grace period of 3 months. Loan reimbursement will be made every 3 months using equal installments, as the municipality has requested.

Expected Impact

The annual electricity savings are estimated at about 599 MWh (equivalent of 171.9 toe). The CO_2 emissions will also decrease with 666 t/year after the project's implementation.

Table 1

Item	USD*
Equipment	217.500
Design and installing costs	50.000
Total project	**267.500**

* - Figures include all import, customs and other taxes, but do not include VAT.

Table 2

	Year										
	0	1	2	3	4	5	6	7	....	19	20
	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD	kUSD
Initial investment	-267.5	-	-	-	-	-	-	-	-	-	-
Cash Flow	-267.5	87.577	87.577	83.050	79.429	64.943	64.943	64.943	...	64.943	64.943
Accumulated Cash Flow	-267.5	-179.92	-92.346	-9.296	70.133	135.075	200.018	264.961		242.1	248.2
Discount Factor	1.00	0.89	0.80	0.71	0.64	0.57	0.51	0.45	...	0,12	0,10
Present Value of the Cash Flow	-267,5	-189	-119	-60	-10	27	60	89	...	271	278
Payback Period	3.1	years									
Discount Payback Period	4.2	years									
Net Present Value	278	kUSD									
Internal Rate of Return	29	%									

The Romanian Energy Efficiency Fund financing advantages

Main advantages of the Romanian Energy Efficiency Fund financing are:

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