



Green Light Graz - Modernization and saving energy at street lighting in the City of Graz

Graz Energy Agency, Austria

Summary

In 2005, the Pilot Project "Green Light Graz I" (modernizing street lighting along the main traffic route Wienerstraße – Gürtel and other main streets) was started. 718 lamps in main streets were renewed and provided with state-of-the art technologies and control engineering. The Graz Energy Agency has taken over the whole project handling for contract management as an overall package by order of the City of Graz. As for technical implementation and financing, the Graz Energy Agency co-operates with Energy Graz. Together these two organizations guarantee the calculated energy savings! The costs are amortized by the savings. No additional investment costs accrue to the City of Graz. On April 26, 2006, the City of Graz was presented with the **Green Light Award 2006** in Frankfurt for its programme!

End-user area	Target Audience	Technical
New buildings	Citizens	Energy efficiency
Refurbishment of buildings	Households	Heating
Transport and mobility	Property owners	Cooling
Financial instruments	Schools and universities	Appliances
Industry	Decision makers	Lighting
Legal initiatives (regulations, directives, etc)	Local and regional authorities	CHP
Planning issues	Transport companies	District Heating
Sustainable communities	Utilities	Solar energy
User behaviour	ESCOs	Biomass
Education	Architects and engineers	Wind
Other	Financial institutions	Geothermal
	Other	Hydro power
		Other

Context

At the moment street lighting in the City of Graz has approx. 24,000 lamps plus special illumination, such as on the Hauptplatz or over the Mursteg. These lamps are directly controlled by approx. 1,400 switch boards. The electricity costs (incl. energy fee and VAT) amount to about Euro 1.17 million a year. Many lighting installations are from the 1960's and are up to 40 years old. Therefore, there is a tremendous need for modernization! Big energy saving opportunities are offered by the use of up-to-date technologies – new highly efficient lighting equipment, new lamps with mirror technology and light regulation as well as control adjusted to the needs (reduction of power consumption over night). However, the funds required for putting all this into action have been missing up to now.



Objectives

The objective of the programme “Green Light Graz” is to modernize all the street lighting in Graz wherever there are opportunities of saving money and to open up the opportunities of saving energy. The implementation of the programme “Green Light Graz” enables the City of Graz to profit in various respects:

- saving costs in terms of energy and renewal;
- immediately relieving the budget by implementing the Thermoprofit Model;
- improving “quality of lighting” in the City of Graz – creating a more modern cityscape!
- implementing the objectives and targets of KEK Graz (KEK – Kommunales Energiekonzept – Municipal Energy Plan): increasing energy efficiency and saving energy, reducing CO₂ emissions;
- immediately holistically opening up the efficiency potentials instead of taking long-term isolated measures that fail to yield equivalent success at saving

Process

In 2005, the Pilot Project “Green Light Graz I” (modernizing street lighting along the main traffic route Wienerstraße – Gürtel and other main streets) was started. 718 lamps in main streets were renewed and provided with state-of-the art technologies and control engineering.

- diecast aluminium lamp with the System of Protection IP66;
- no need for tools when opening and thus ease of replacing the lighting equipment;
- highly efficient reflector with a facet look;
- glass vessel made of safety glass;
- switching and reducing control for reducing power consumption over night

The Graz Energy Agency has taken over the whole project handling for contract management as an overall package by order of the City of Graz. As for technical implementation and financing, the Graz Energy Agency co-operates with Energy Graz. Together these two organizations guarantee the calculated energy savings!

Maintenance and servicing, operation, troubleshooting and elimination of defects, etc., continue to be conducted by Energy Graz within the existing contract. The energy delivery contracts remain unaffected by this agreement.

The Graz Energy Agency presents an annual report to the City of Graz. This report states the savings and evaluates implementation.

The Thermoprofit Implementation Model

In the course of this project, all the project costs (engineering, investment, management, controlling, etc.) are pre-financed and re-financed by the City of Graz paying a monthly contracting rate (energy cost budget). This means no investment costs accrue to the City of Graz.

Furthermore, the financing model has been designed as to make sure that the City of Graz is given a share in the savings achieved from the beginning. This makes a direct contribution to relieving the budget. After the end of the term, the complete savings will be for the benefit of the City of Graz!

The nominal contractual period amounts to 15 years.

The monthly contracting rate remains the same throughout the term. The financing model is based on a variable rate of interest, the monthly contracting rate remaining constant and the term being adjusted adequately.



Financial resources and partners

In the course of this project, all the project costs (engineering, investment, management, controlling, etc.) are pre-financed and re-financed by the City of Graz paying a monthly contracting rate (energy cost budget). This means no investment costs accrue to the City of Graz.

Order value: 1.804,174.-€ (gross)

Results

The energy savings

Lighting hours:	4161 hours
Power consumption before the measures:	905,766 kWh
Energy savings – guaranteed !	524,000 kWh (- 58 %)
Energy savings, actual:	533,100 kWh (- 59 %)
Savings of energy costs:	67,200,- €/year

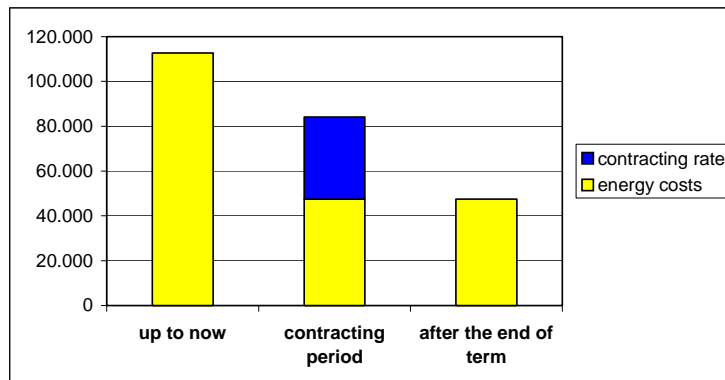
This means the guaranteed savings are even exceeded. The additional savings to the amount of € 2,000.- are for the benefit of the City of Graz.

The cost savings

Costs and savings for the City of Graz per year:

	up to now	contracting period	After the end of term
Energy costs	112,790.-	45,590.-	45,590.-
Contracting rate		36,567.-	
Total costs	112,790.-	82,166.-	45,590.-
Savings, City of Graz		30,624.-	67,200.-

Thanks to the Thermoprofit Model, the budget is immediately relieved by approx. € 30,000.- a year. After 15 years, the full saving to the amount of at least € 67,200.- is for the profit of the City of Graz.



Cost savings for the City of Graz Euro a year - before, during and after the contractual period

(actual savings depend on the energy price, lighting hours and level of interest).



Lessons learned and repeatability

It is true savings to a similar amount as at the first project can no longer be achieved. Nevertheless, the use of up-to-date technologies still offers significant economic energy saving opportunities.

An estimate made by the Graz Energy Agency and Energy Graz shows that economic saving measures might be taken at about 15,000 light points. In addition to the use of efficient lamp and control technologies, such innovative measures as LED technology and solar lamps can be integrated.

As for the considered light points, there is a saving potential of about 20%. This results in energy cost savings of approx. Euro 120,000.- a year for the City of Graz.

Even in this case implementation using a Thermoprofit Model could take place in such a way that the City of Graz can immediately profit from the savings and the budget is thus relieved.

Contact for more information:

Organisation / Agency: Graz Energy Agency

Main contact: DI Boris Papousek

Address: Kaiserfeldgasse 13/I

Tel: +43/316/811848-0

Fax: +43/316/811848-9

E-mail: office@grazer-ea.at

Web Site: www.grazer-ea.at