



Energy efficient Streetlight renovation

Kalmar Municipality, Sweden

- Bundling of project saves money
- Energy efficient streetlight saves kWh and CO₂
- Better vision for traffic and pedestrians

BEFORE



AFTER



Old installation

- 50x70W (83W) sodium
- 17430 kWh/year

GPP tender

- Energy efficient streetlight, LED
- Bundle projects

Results

- 50x46W, dim 32%
- 6420 kWh/year
- 60% energy savings, approx. 11000kWh

Introduction to case

1.1 PITCH-TALK – SUMMARY

The work was triggered by a need for enhanced high voltage supply delivery to the hospital. The municipality was asked by the energy supplier, Kalmar Energi, if there was an interest to take the opportunity to change the lighting cables in connection with the cable work. Kalmar Municipality decided to change the cables, exchange the sodium lamps to LED and do an inspection and possible replacement of light poles. The project also included new investment in an additional lighting on walking and bicycle paths to improve safety and accessibility.

2



1.3 CASE CONTENT AND CASE ISSUE

By reinvesting in old street light systems, municipalities can contribute to a better climate, a more efficient energy use and save money (less cost for energy as well as for maintenance). Energy efficiency is an important factor to help achieving goals for sustainability, both in Sweden as well as globally. A new streetlight system can save between 40-80% of the total energy consumption, and 50-80% of the maintenance cost). When reducing energy consumption municipalities also reduced greenhouse gas emissions. Another important aspect is that modern lighting solutions can also contribute to better light quality, increased safety and security, and better health. This case study also shows how important it is to cooperate with other actors and other refurbishment projects in order to create better solutions and save even more money.

1.4 SOLUTIONS APPLIED

Renovation of the lighting cables was carried out in collaboration with another project that enhanced the high voltage supply to the hospital. The work was performed by the Energy Supplier.

The inspection and possible replacement of light poles was carried out by the company that Kalmar municipality has contracted for maintenance work, they also carried out the replacement of the LES fixtures.

The fixtures were sub-ordered from a framework contract. For many streetlight refurbishment projects this is a common way to handle the procurement of the fixtures and luminaires.

Contract tendered

The project includes the replacement of streetlight luminaries and add additional lighting on walking and bicycle paths to improve safety and accessibility. The work was carried out within an existing framework contract for maintenance and the luminaries were suborder from a comprehensive framework contract. For many streetlight refurbishment projects in our region is this very a common way to handle this kind of projects.

The total contract for luminaries was 226 000 SEK ≈ 23 606 € (VAT excl.).

Procurement objectives

- To replace the old lighting system in one streets with new LED lamps
- To save costs through reduced energy consumption and reduced maintenance costs
- Add additional lighting on walking and bicycle paths to improve safety and accessibility
- Have customized optics for the roads to be illuminated
- An extra objective not included in results of the case study
- To bundle projects (cable, poles and replace luminaires and add new luminaries and poles) to save time and money and to reduce disturbance of traffic



Procurement approach

During the task force intervention in the PRIMES projects both consultants, suppliers and other municipalities have clearly pointed out the importance of coordinating lighting renovation project with renovations of other cables so that the municipality avoids getting a new lighting system, but with the old cables. This can result in that the excavation work must be redone which leads to extra cost and dissatisfied citizens.

So Kalmar Municipality used the improved knowledge from the TFI to develop this project and the goal was therefor to take advantage of the possibility to bundle projects to save money, and at the same time get at better more energy efficient streetlight solution.

For the Kalmar municipality it is important that the streetlight installation contributes to secure environments, with good color reproduction and that the light doesn't

dazzle people driving cars or pedestrians. It is also important to the aesthetic shape of the entire system (the height, location, design of the poles and armature) fits into the surrounding environment.

- Subject matter; replacement of streetlight luminaries and add additional lighting on walking and bicycle paths, inspection and replacement of poles and new cables for lighting for the streetlights in the street Ståthållaregatan.
- The procurement of the framework contract for maintenance and refurbishment work and the procurement of the comprehensive framework contract is not included in this case study.
- Funding: the municipalities own finances
- The chosen luminaires were the ones that correspond to the requirements of energy efficiency, design, no glare and uniform illumination based on height and distance between the posts as well as easy maintenance and with customized optics for the roads to be illuminated. And the luminaries that were installed are
- (Philips)Iridium BGP381 GRN19/740 WSO CLO C8K with DDF2
- (Philips)Iridium BGP382 GRN65/740 DW CLO C10K with DDF2



Figur 1 The new lighting system at Ståthållaregatan with the extenden lighting for walking- and bicyclepath



Criteria development

The municipality purchased the technology that fit in to requirement within the field of energy efficient lamps, LED with customized optics for the roads to be illuminated. The specification was developed by the municipalities own expertise with support from the TFI in PRIMES and the

Results

The old installation had total installed electric capacity of 4150 W and total operational hours of 4200 which results in a yearly energy consumption of 17430 kWh/Year. There were no periods of dimming or switch-off during night. The new system has total installed electric capacity of 1540W total operational hours 4200h which results in 6420 kWh/Year with customized optics for the roads to be illuminated. Energy saving per year: 11000kwh

The CO₂ emissions and reduction¹ is calculated on the Swedish energy mix 20 g/kWh.

	Investment volume (€)	Energy savings (kWh/year)	CO ₂ reduction (tCO _{2e} /year)	Payback time (€)
	23 606 €	11000 kWh/year	1	N
Total	23 606 €	11000 kWh/year	1	N

6



Other results

- The municipalities own experts has gained new knowledge
- Better understanding and cooperation between the municipality and the energy supplier about the benefits of bundling projects.
- The additional lighting on walking and bicycle paths that improved safety and accessibility
- Minimum disturbance of traffic and less complaints from citizens since the excavation work only had to been carried out one time.

Lessons learned

- To invest in new streetlights is positive for the climate, the citizens, and the municipal financials.
- To cooperate with other actors that have installations or other interest nearby streetlights can create new opportunities.
- This case study is relevant for Energy suppliers, Maintenance contractors and municipalities. It can also bring some inspiration and new knowledge to infrastructure strategist/managers (or responsible for sustainable transports) energy- and climate strategist /managers.
- In some areas of a city or a municipality is the design and shape of a streetlight installations is of great matter. Make sure to have

¹ Of the Swedish carbon emissions (2013) were approximately 2.2 million tons from generated the electricity usage. This means that emissions per kWh was as low as 15 g / kWh, a figure which historically was on average 20 g / kWh. This compared with emissions from the Nordic electricity production amounts to about 100 grams of CO₂ / kWh and emissions from European electricity production amounts to about 450 grams of CO₂ / kWh.

established internal communications (eg like a lighting council) so all interests are involved from the start. To have a lighting strategy for the entire municipality, with a reinvestment plan, will

- Make cooperation's easier – you know what and how to proceed in projects and can make quick decisions
- Make the design of the installation easy to define for each new project.

Contact

Christel Liljegren, Deputy Managing Director, The Energy Agency for Southeast Sweden

Phone: +46 (0) 706-208 308. Email: christel.liljegren@energikontorsydost.se



About PRIMES

Across six countries in Europe; Denmark, Sweden, Latvia, Croatia, France and Italy, PRIMES project seeks to help municipalities overcome barriers in GPP processes, many of which lack capacity and knowledge.

PRIMES aims to develop basic skills and provide hands-on support for public purchasing organisations in order to overcome barriers and implement Green Public Purchasing. This will consequently result in energy savings and CO₂ reductions.– www.primes-eu.net

About GPP 2020



GPP 2020 aims to mainstream low-carbon procurement across Europe in support of the EU's goals to achieve a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020.

To this end, GPP 2020 will implement more than 100 low-carbon tenders, which will directly result in substantial CO₂ savings. Moreover, GPP 2020 is running a capacity building programme that includes trainings and exchange. – www.gpp2020.eu



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