



High savings through joint procurement of low carbon street Lighting and management

- By modernizing streetlight infrastructure with LED and introduce light control systems the Municipality of Roskilde anticipate to reduce energy consumption with 75% and CO₂ with more than 190 tons pr. year
- Furthermore are operational and maintenance cost reduced and total yearly saving is 345.000 €
- Street lighting is an important aspect of the growing concept “Smart City” where technology is interpreted in relation to effectiveness and sustainability.
- Similar urban municipalities who want to modernize their street lighting and rethink their strategic development guidelines can benefit from this case.



Standard product / old tender

- 3.800 conventional luminaries in total

GPP tender

- Outsourcing of operation and maintenance
- Modernization of 1.700 streetlights to LED with light control

Results

- 75% energy saving, 480.000 kWh/year
- CO₂-emission reduction: 192 tons/year
- Cost saving from O&M: 345.000 €/year
- Better control, monitoring and flexibility

Introduction to case

1.1 PITCH-TALK – SUMMARY

The Municipality of Roskilde decided to participate in a joint procurement on modernisation and maintenance of street lighting with three other municipalities. The joint procurement saved administrative resources and gave access to preparatory studies of the economic potentials for modernising the infrastructure. Yearly total cost savings are estimated to 75% and investment is funded as a state-credit repaid through energy savings.

1.3 CASE CONTENT AND CASE ISSUE

Roskilde Municipality has 3.800 luminaries of which 1.700 are old and energy-intensive. Previously the infrastructure was operated and owned by an energy company and the municipality covered cost without influence on investments. To gain benefits of the last decade's development in the LED light solutions, the municipality has bought back the infrastructure from the energy company and proceeded a procurement divided in two lots, a) operation and maintenance of 3.800 units and b) modernization of 1.700 elder units. Some of them are more than 40 year old.

Preparation of the tender are coordinated with three other municipalities in a joint procurement and administrative resources are saved and the pool of best practise experience was expanded. Furthermore, a preparatory work was conducted analysing financial data and the saving potential.

1.4 SOLUTIONS APPLIED

The solution is outsourcing the maintenance for all 3.800 streetlight units in 5 years with an option for three more years. Further, 1.700 old streetlights not modernized yet, will be modernized as a total enterprise for the supplier. Investments are covered by the municipality.

The specific solutions depend on the particular functional needs and architectural requirements but basically all the modernizations includes new mast, LED technology and light control system. The average cost per unit is approx. 130 €/year and the average saving per unit is estimated to approx. 100 € per unit per year. A general figure is 50% energy saving by shifting to LED, and further 30% energy saving and operational cost saving by introducing light control system.

Contract tendered

The tender covers a 5 year period and includes:

- Operation and maintenance of 3.800 streetlight units divided into 4 different areas in Municipality of Roskilde. Operation and maintenance covers all types of cost such as energy cost, maintenance cost, cost for control system maintenance and development, waste management etc.
- Modernization of 1.700 old streetlights. Modernization is a full outsourcing and covers all types of cost to e.g. construction work, waste management, equipment, planning etc.

There is an option included for prolonging the period with 3 year.



Subject Matter: Operation, maintenance and modernization of road lighting equipment

Value of contract: approx. 590.000€. The investment volume in new streetlights are estimated to 1,735.000.000

Procedure: The tender followed a restricted procedure, consisting of a pre-qualification phase and a tendering phase. Suppliers were able to bid on a single lot or more lots. For each lot five suppliers were pre-qualified.

Type of contract: The contract comprise operation, service, maintenance and modernization of specified including disposal of existing units, constructionwork and installation of new units, reestablishment, monitoring and administration.

Nature of contract: Direct contract.

Division in lots: Tender was divided in two – a) operation and maintenance and b) modernization. The tender was a joint procurement between four municipalities. The procurement was prepared as four partial tenders, each containing a description with the specifications of the contract for each municipality.



Procurement objectives

The procurement objectives were twofold:

- a) Modernize street lighting in Roskilde Municipality to energy efficient LED with light control systems and through this reduce the total cost from operation and maintenance and at the same time reduce the CO₂ emission.
- b) Outsource operation and maintenance and gain benefits of the incentives suppliers have for introducing the best technologies in a total cost perspective. The operation and maintenance period is 5 years with an option for 3 more years.

An initial assessment concluded a potential to reduce operation and maintenance cost with 60-80% if the modernization was organised as a public tender. The yearly saving was estimated to 400.000 €. The assessment calculated that the average cost per streetlight per year is 133 € and can be reduced to 27 € with new LED installations and light control systems. The savings will be achieved through energy savings, reduced maintenance cost and reduced man hours to maintenance.

Beside the overarching objective, it should be a flexible system working effectively within various areas of the city as well as on the countryside.

As preparation for the tender, a consultant report was conducted including recommendations for a tender and based on marked experiences and considering LCC.

It was also an objective to save administrative resources by organizing the tender as a joint procurement with three other municipalities. Another municipality (Frederikssund) was leading the joint procurement.

Procurement approach

The procurement was a restricted tender organized as a joint procurement between four municipalities with each separate sub-agreement. The sub-agreement covering Roskilde

Municipality concerns 3.800 street light units whereas 1.700 units are required modernized during the 5 year period for the tender.

The tender used standard eligible criteria for financial, legal and technical capacity. In relation to technical capacity, the bidders should a.o. document experience from similar projects within the last 3 years.

Award criteria were lowest price (per sub-agreement). Weighting was as following:
 Price for operation and maintenance (50%)
 Price for modernization (45%)
 Price for optional 3 years operation (5%)

No other criteria are used, e.g. minimum specifications for LED energy consumption etc. This is up to the bidder to propose, however the bidder will only could perform a competitive bid with very effective low energy units to meet the criteria for low operational cost.

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Detailed specific data including age, product names, logs, district and placement, energy consumption etc. for the units comprised tender was provided in appendixes to the tender.

Modernization, full maintenance and operation of the streetlight are the subject of the tender. And considering the general LED streetlight technology has shown superior and competitive green and cost-effective performance, the central green criteria are accomplished by choosing LED with light control systems. If bidders choose not to use LED in the project, they have no chance to be competitive on lowest price.

Municipality of Roskilde owns the streetlight infrastructure. Investment in new LED streetlight appliances, power switches, control systems etc. are financed through KOMMUNEKREDIT (state loan for energy investment repaid by energy saving).

To assure a continuous implementation of best available technology and a fair price sharing if conditions are changing, following clauses were included in the contract:

Proposals for technology improvement. To assure continuous use of best available technologies, it is included in the contract that supplier shall offer such technology developments to the municipality following a specified procedure starting with a proposal and an investment plan from the supplier, and if municipality agrees, cost saving will be shared equally between supplier and municipality. Thus, the supplier is always assured at least same overhead as originally agreed.

Savings from lower marketprices. To gain equally if marketprices for equipment are reduced over time, it is included in the contract that cost saving will be shared equally between supplier and municipality. Thus, the supplier is always assured at least same overhead as originally agreed.

Criteria development

The tender documents are developed and defined from initial studies and data of previous operation, an assessment report determining saving potentials and estimated investment cost and general knowledge to the subject. Market sounding has indirectly been delivered in the consultant report. General inspirations are received through case-experiences from other Danish municipal stakeholders.

Results

	Investment volume (€)	Energy savings (€/year)	CO ₂ reduction (tCO _{2e} /year)		Payback time (€)
	1,735.000.000	90.000	190		5,5 years

The yearly energy expenses for operation of the units covered by the tender are approx. 118.000 €. The average energy saving is 75%, yearly energy saving is therefor calculated to approx. 90.000 €. Cost per kWh is 0,21. Total kWh saving per year is 415.000 kWh. Average CO₂ is approx. 0,4 kg. CO₂ per kWh (Official data for DK CO₂ emission from 1 kWh vary from 0,35 – 0,5 kg depending on particular year).



Investment volume is the average total investment cost in new infrastructure.

Lessons learned

Following lesson learned should be emphasized:

- Joint procurement has saved administrative resources and assured more capacity and knowledge on the subject
- Pre-study report with data for existing infrastructure and estimation of potential savings was an important basic for the further tender
- Buy back/ownership of infrastructure a preconditions for fast track in implementation of new technologies and related energy and cost savings
- Even newer units (after year 2000) can be modernized with good pay back profiles
- Light control system is important feature to reduce energy consumption while light need can be maintained individual but also for reduction of maintenance cost because monitoring can be made centralized

This case can be replicated to all entities responsible for operation and maintenance of streetlights.

Contact

Roskilde Municipality. Jeremy Andrew Dennis (jeremyas@roskilde.dk)

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

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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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