



Summary report on "Practical implementing streetlight-EPC projects" Project Partner: ESS

Starting point & project objectives

Street lighting is a very important public service provided by the local authorities all over Europe, but it doesn't come for free. Around Europe, streetlights account for about 10 percent of the continent's total electricity consumption. This causes great cost but also annual CO₂ emissions of almost 2,900 million tonnes. To reach the energy and climate objectives, energy efficient work in street lighting is a key area for investment. There are not only major opportunities to significantly reduce electricity consumption, but also additional benefits associated with phasing out environmentally harmful technologies (eg mercury lamps), reducing maintenance costs and achieving much better overall control of the street lighting environment. Currently, the exchange and refurbishment of public lighting is being carried out way too slow.

At the same time, Energy Performance Contracting (EPC) markets have not yet developed in many regions. Apart from legal barriers, this is due to the lack of trust in EPC, the absence of experienced ESCOs and of organisations facilitating the EPC market development. However, street lighting is a good learning ground for EPC. This is due to its lower technical and economic complexity and because LED technology offers high savings with short payback time. In the context of the Streetlight-EPC project, street lighting refurbishment project were implemented using the EPC scheme.

Overall, the Streetlight-EPC project aimed to increase market uptake of guaranteed energy services by raising knowledge, transparency and trust in this model and by providing support to concrete project implementation. The work package 5 *Supporting real-life procurement processes*, which focussed on the implementation of EPC projects, made up one of the core actions in the project.

The objective of these activities was for the regional EPC facilitation services (offered by the regional partner) to support the project's city/county partners and other local streetlight owners in developing possible streetlight-EPC projects, preparing the procurement process and implementing concrete refurbishment work. All processes and steps were to be carefully documented and implemented project were to serve as examples to trigger further development of EPC markets and projects.



Other activities carried out as part of the learning and information sharing process included city working visits for city partners and regional working group meetings with key stakeholders to ensure a swift exchange of experience.

Benchmarking

To raise awareness among streetlight owners about the energy saving potential of their lighting system, quick-checks (developed in WP3) were distributed all over the partner's region. With support of the facilitators or by the streetlight owners them self a first self-assessment was carried out to get a first indication if a pre-selected area or street had the potential to become a EPC project. The quick-check assessment meant that the quality and quantity of the plant were estimated and an identification of current costs for energy use was carried out.

For interesting projects the next step was to do further investigations about the potential candidate projects using the datasheets. The purpose was to make inventory of the infrastructure concerning poles, fixtures and lamps as well as cost for energy usage and maintenance – this determined a baseline - and to make qualified comparisons with possible new technology and solutions. By doing this, rough estimated saving and pay-back time could then be calculated. With the new information put together in the datasheet proposals for reinvestment could be presented to boards or mayors and when appropriate advocate EPC as a contract model.

Several suitable projects were now ready to be carried through to a procurement process. To develop tender documents, collect bids and select a winning ESCO the facilitators carried out support efforts to varying degrees depending on the size and complexity of the project, as well as the skills and experience of the contractors.

Procurement criteria

In a EPC procurement, there must be criteria's set for the technical equipment, the realisation of the refurbishment work, the contractual models for guaranteed energy savings, operation and maintenance during the during the contract period and at last also criteria's concerning the capability of the ESCO. Be sure to include technical, financial, environmental and social criteria that can be taken into account.

The basic requirements of the contractor, ESCO, for implementation are skills, resources and financial strength. The criteria's must there for verify; the financial statement and capability to finance a streetlight investment and commitment for the project, that proper insurances are signed, technical capability, previous experiences and results as well as qualification and accreditation in electrical work of the personnel that will be involved.



For the realisation of the refurbishment work, criteria's or demands for practical organisation and handling of quality and environmental issues, management of material and waste, transports as well as protection and management of surrounding installations and objects when shovelling and digging is carried out etc. must be set.

Regarding energy criteria's in the procurement it can be set as technical specification requirements for the product's energy performance, eg. guaranteed energy performance, energy class or degree of efficiency of the ballast. Other technical criteria's of importance are requirements for maintenance and the ability to implement such, light distribution of the luminaire, degree of glare. There must also be technical criteria's for eg. the control system for dimming. Energy criteria's can also be set as award criteria or as special contract terms – this when the contracting entity want the specific procurement to be a part of the development of the market. To require the contractor to carry out LCC calculation for outdoor lighting is a good tool to calculate the total cost of the procurement of a lighting system.

Main findings & conclusions

The energy saving potential for street lighting installation in EU is significant, but all countries and regions have their different obstacles to overcome before an extensive refurbishment is carried out. Start off with fewer, but convincing projects to build up trust and competence.

Awareness is the first key – the goal is to create conscious energy users

The first step is to raise interest and awareness among key stakeholder in the organisations owning the streetlights. They need to be aware about laws, regulations and the possibilities with new techniques such as LED as wells as LCC, EPC and ESCO. The streetlight owners also often lack awareness about if they have a high or low overall cost for the streetlight compared to others. Documentation about energy usage, maintenance costs and quality of the installations is often poor - without knowledge of a current situation, a conscious energy consumption cannot be obtained and no there will therefore not be any incentives for improvement. To explain the importance of knowledge gained from eg. energy analyses are crucial to achieve an understanding of the need and benefits of streetlight refurbishment projects. It is also very important to gain politic acceptance and awareness for streetlight projects since many local authorities need political approval of tenders.

At the same time, current and potential ESCOs must get higher awareness about the business opportunities that streetlight projects give. This important to obtain sufficiently number of companies, in a region or country, to both get enough tenders in different procurement and but also to drive a market development so that services are continuously improved.



Increased knowledge is the second key – the goal is to create trust

Everything that's new and that brings about a change causes uncertainty – in this case, it applies to both clients and suppliers. For the streetlight owners, a trust must be obtained so that uncertainty about new technique is reduced, this since streetlight is a very important public service that must meet the quality and requirements of a good illumination and which must always work to ensure security and safety in the city or area. But trust must also be built about how to rely on the EPC model and the ESCO that will be contracted to invest, operate and maintained in their streetlight system.

For the ESCOs the uncertainty is almost about the same issues, they must gain trust and have know-how about the technique and qualitative data they will offer and deliver, and that they will understand and manage the contractual and financial aspects of the EPC. They must also trust the streetlight owner's reliability during the long upcoming partnership.

Well prepared projects – creates consensus for future successful collaborations

If a streetlight owner doesn't know what they have or what they want to achieve with a new lighting system, no ESCO, no matter how skilled, will be able achieve a successful EPC.

A good project preparation is an important key to success. The streetlight owners must define and have internal consensus about over all purpose and objectives of the public lighting (internal priorities of the different aspects such as safety, design, energy efficiency etc), what's considered as reasonable costs of the renovation and future operation and maintenance in relation to costs for design and installation of additional technology for the new streetlight system (LCC must be included to define this). But preparation the work must be adapted to the size and complexity of the project, eg. as a starting point, proper meaningful inventories and audits is fundamental and must be carried out - but not so detailed that costs become prohibitive! And it is also important to understand that there is no "one-fits-all" solution – either concerning technique, design or contractual models. In many countries, there are a lack of contract documentation/contract model so it is important to prepare and discuss this prior the procurement.

To have an inventory for the internal competence and available resources (time) in an early stage is important, this since the inventory and procurement process might be difficult and a lot of internal competence must be involved. This first assessment will support the decisions how much external support that will be required.

The streetlight owners should have a proper amount of time and be open when looking for ESCOs, use the projects help new companies becoming ESCOs in the regions. Also, remember to give the ESCOs enough time and information to prepare the offer to increase the quality and build up trust.



Monitoring and cooperation – EPC is an investment in a long-time relationship

For a successful EPC project the relationship between the client and the ESCO must be considered as a partnership where both parties must contribute for a happy ever after. Open dialogues and regular meetings are crucial.

There must also be an agreed on and clear method for defining and measure the state of the art and expected results of the LED for both the client and the supplier to understand and work based on the same conditions (if there aren't standard methods applicable this is even more important). This is so that the provided guarantees can be monitored throughout the project in accordance of the contract.

Non-economic work, values and benefit – public service and public acceptance

As well as everything that's new and that brings about a change causes uncertainty for streetlight owners and ESCOs the same goes for the citizens and other stakeholders. It is important to understand that a streetlight refurbishment not necessary will be embraced by the public this since a new lighting will not automatically be perceived as an improvement. Therefore a developed communication plan is a helpful tool to raise awareness and create understanding.

Also, to define the needs from and cooperate with other stakeholders such as police, social services, schools, energy- and climate strategists, strategists for sustainable transportation when planning a refurbishment will increase the benefits from the new streetlight and might also save time and money and makes it possible to get it right the first time. Another important measure is monitor other maintenance or renovation work that are about to be carried out in the area where the lighting needs to be replaced. Bundling projects reduce the disturbance of road users and reduces costs for implementation.

Quality

The overall lesson learnt is that EPC process supports solution with higher-level technical quality. The internal competence required will be different depending if EPC is chosen or not. Without EPC internal technical and financial skills is essential with EPC, procurement competence and knowledge about contractual models is needed to obtain quality.

Key recommendations – where there's a will, there's a way

EPC in all its different forms works to obtains good qualitative streetlight refurbishment projects. But the demand needs to increase and we need more ESCOs. The facilitators must be on both sides to support both municipality/company and ESCOs.

Framework, support and regulations

The legislation and regulation for EPC and PPP must be improved in several countries so that the market can develop in a healthy and competitive direction. Action plans for GPP might be needed to increase the pressure on the local authorities to prioritise these energy



efficient refurbishment projects. There must also be national standards for different tools such as LCC so that quality of the data will increase.

In the organisations, there must be a clear and documented responsibility for streetlight issues, this responsibility should also include monitoring and following up on energy- and climate objectives. Established internal procurement procedures following a clear and updated procurement policy should be implemented to guide and create strategic approach to upcoming refurbishment projects so that energy efficient objectives will be reached. Refurbishment plans (priorities based age and condition of the system) supports the possibility to find and plan for applying for funds but also to create cooperation with external stakeholders when bundling projects.

Raise awareness

Facilitators must have time and resources to work with measures to raise awareness among the different stakeholders – both clients and ESCOs. Effective ways are to share good practises from others and to get information about how the process and timeline for a project can look like. Study trips to see and experience the LED for politicians and staff creates an understanding of the possibilities with the technology.

Funding for facilitation services will keep this work possible.

Knowledge

Facilitators and ESCOs must be able to understand that EPC can be many different things and to be able to describe business models for EPC (PPP, LCC etc), adapted for both small and larger projects as well as project bundled with other measures for streetlight owners. Funding to enable training for ESCOs and helping them on how to communicate EPC is a key activity to have more ambassadors. If facilitators and ESCOs cooperate to develop a qualitative and uniform communication to the streetlight owners, to achieve awareness, the demand for EPC services will increase. Open pre-procurement supplier dialogues are a possible tool to use to create platforms for exchange of knowledge between clients and ESCOs.

Further, extended training in GPP must be carried out to support the procurement department and prepare them for upcoming complex EPC procurements. Also, ways to support and develop EPC procurement for small projects need to be developed.

Well prepared projects

Obligatory, transparent and adapted energy audits for streetlight refurbishment, based on accepted methods must be used and clear methods for LCC and LCA must be developed. Time is essential for both clients and ESCOs. For the staff in the municipality the internal work must be prioritised and there must be a sufficient a budget or funding for learning and planning.



Monitoring and cooperation

Clear objectives and street lighting programs as well as common comparative/key performance indicators on local, regional and national level needs to be developed to have a qualitative and competitive monitoring of the streetlight system and to be able to measure the improvements at all levels.

Non-economic work, values and benefit

Better information must be developed to municipalities and other streetlight owners, about the non-economic values of new street lighting, and training and information must be carried out for them on how they can communicate this to the public.

