Energy efficient streetlighting with energy contracting performance model

Streetlights are essential in every village and city to assure safety, security and evening life. At the same time, they harm the environment – use a lot of energy and negatively influence the life of night animals. Therefore, the energy efficient and well-designed streetlight system is very important for each community and public spaces. In Slovenia many municipalities have used energy performance contracting to energy and environmentally refurbish the streetlighting systems. The reports show that they have saved money and improve the lighting conditions without the initial investment when using EPC.

Energy and environmentally efficient design of lighting

Two smaller municipalities in Podravje region have renovated the streetlighting system in 2017. Initial energy audit was done where detailed register of all lights was prepared. The current energy use was calculated and the lighting standards were checked. The audit of municipal budget was also done to find all streetlighting related cost were checked like maintaining, new bulbs, transport and lift costs and similar. The refurbishment project was prepared where for each lighting point new LED light of certain power and characteristic was proposed. Then the investment cost, energy and financial savings potential were calculated. When financial analysis had shown that with savings the initial investment could be paid the municipality had decided to use EPC model for renovation. Private partner was selected within public procurement procedure was selected. Within the negotiation phase the municipality also decided to use colored lights in the historical center and private partner was able to offer them within the proposed financial model. The work was done in very short period what was very important for citizen. Private partner guarantees the energy savings in the EPC contract for 15 years. They also maintain the streetlighting system according to the standards and needs of the municipality. The annual cost savings are then used to cover the investment and capital costs. Overall project objectives were to achieve savings and to have the lightening accordance to the environmental and technical standards.

Money and CO2 savings with better lighting

Success factors of the projects are good technical preparation. It is crucial to have a meaningful and accurate inventory of the existing street lighting system as well as a good-quality audit to determine reliable saving potentials. LED solutions are showing to be proven technologies that are suitable for very small and very large projects and permit high energy savings at high lighting comfort. Even if investments are not very big usually municipal's budget is lacking of the capital or they have more needs in the areas where public private partnerships are not possible. In many cases EPC can offer a solution to overcome this obstacle. More than 70 % of money saving can be achieved. LED lights has longer life time and need less maintaining work what is also very important. In Slovenian law the maximal energy use for municipal streetlighting is defined. Therefore, it is very important to have energy efficient lighting to be able to fulfil also all lighting needs in the future. LED technologies are also very propriate to be combined with solar energy what can give even higher savings. Usually experienced private partners have good overview of the global solutions in the field of lighting that could be implemented in your areas.

Modern street lighting

When preparing streetlighting projects, it is important to look also in the future and set modern quality criteria. Technical specifications for a street lighting refurbishment include electrical power, luminous efficacy, light colour, expected service life, the ability to switch on/off and control the system and test certificates. New technologies of monitoring and control combined with solar energy, smart city solutions like video signals, environmental sensors are opening the whole new filed for municipalities. Street lighting poles can also serve as the filling stations for e-vehicle.

Are savings achieved?

When implementing the streetlighting projects using EPC model the savings are guaranteed with the agreement. According to the law not achieving them usually means that penalties should be paid. Energy agency of Podravje is monitoring the standards and savings in energy and money. The results shows that energy savings are reached in all projects or even higher than planned. Financial savings are depending on the electricity costs and when taking into account the price rise also financial savings are realized. There is no problem adding new lights. They can be easily added to the management system. In some cases, also new lights can become part of EPC agreement.

The society believe in environmentally efficient lighting

- Streetlighting is an important contributor to traffic and public safety
- Energy and environmentally efficient lighting is already a standard in modern world
- 70 % of energy and CO2 savings can be achieved when using modern LED lights and management systems
- It is important to have good technical design of the projects
- LED lighting can be combined with solar energy and smart city solutions
- Energy performance contracting EPC can be used for small and big projects
- Expansion of the number of lights is easy also within EPC contract
- Yearly monitoring of the results is important

Photos: ENERGAP

The PROSPECT+ project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101023271

Contact
ENERGY AGENCY OF PODRAVJE, Smetanova ulica 31
info@energap.si, www.energap.si