



Public lightening development strategy for the Municipality of Velenje KSENA, Slovenia

Summary

Energy inefficient public lightening is not just a problem for local municipalities. Problems of this kind occurred in all major and fast developing cities. The constant increase of the infrastructure leads to a lesser insight to the quantity and the types of the lights that are installed, and consequently the overview of the power consumption is also lost. Problems that occurred in the local municipalities often have a common starting point. Several local communities tried to solve the problem in numerous different ways, but only a few successfully.

Energy consumption and the cost for public lightening increased every year in the Municipality of Velenje.

Energy consumption in Municipality of Velenje for public lightening in 2005 was **1 788 802 kWh**.

In 2006, in the framework of KSENA's activities, we developed the energy efficient *Public lighting strategy* to reconstruct it according to the strategic and specific objectives and *Decree on limit values due to light pollution of environment (Official gazette of Slovenia, 81/2007 and 109/2007)*.

The main goal of the strategy is to realize energy efficient investments into public buildings, as a role model for others municipalities and to decrease energy consumption, costs and CO₂ emissions from public lightening. By executing the action plan developed in the strategy, the energy consumption in 2008 was decrease with **1 100 783 kWh**.

Partnership: Municipality of Velenje and Energy Agency of Savinjska, Šaleška and Koroška Region - KSENA;
Main sources of founding: Municipality of Velenje

End-user area

Sustainable communities

Target Audience

Citizens

Decision makers

Local and regional authorities

ESCOs

Technical

Energy efficiency

Lighting

Solar energy

Context

Countries all over Europe encounter problems with excessive outdoor lighting. A lot of roads and buildings are incorrectly illuminated. Unnecessary or incorrect illumination has two negative impacts: excessive energy consumption and light pollution.

More than 10 % of energy consumption in Europe comes from lighting. This is causing high expenses and green house gas emissions. A lot of luminaries are old and energy insufficient. Buildings, promotional signs and billboards are incorrectly illuminated and causing unnecessary electrical consumption and lighting pollution. All of that is financially burdening municipalities. Problems occur when municipalities do not have data about type and number of luminaries, which are mounted in local community. This database is a must have for all other activities and achieving our goals.

Another aspect is a lighting pollution. Luminaries with indirect lighting current causes light pollution. This means that lamps do not just illuminate ground or road, but also the surroundings and sky. The inclined beams of light are travelling through the atmosphere and reflecting on aerosol particles (for example, water droplets and fine particles) in the air and causing night glow over the cities. This is causing big problems for astronomical observations. Non-shaded lamps are also causing glaring, which has serious consequences in traffic safety, especially for older people.

There are a lot of municipalities in Slovenia with the same problem of inefficient and technologically obsolete public lightening infrastructure. Huge amounts of money are spent mainly for maintaining the public lightening but not for energy efficient investment. The second large problem is lack of experts in the field of public lightening in municipalities.



- The public lightening infrastructure include 2 900 lamps. The power consumption in 2005 was 1 788 802 kWh, the costs were over 200 000 €. Over 70 % of all the lamps were energy inefficient, wasteful and technologically obsolete.
- Inefficient and often broken glasses were a disgrace for the Municipality of Velenje.
- The action plan has to be developed for the entire reconstruction of the public lightening.

Objectives

Specific objective:

To determine the action plan on how to reduce energy consumption and costs for the public lightening in the Municipality of Velenje;

- To improve the energy performance of existing street lighting systems
- To improve the capacity of responsible persons for street lighting in local authorities for the purpose of using intelligent energy solutions and increasing the demand for such solutions
- To facilitate implementation and monitoring of energy performance of street lighting
- To promote energy services, procurement guidelines and training for local authorities
- To increase the use of energy efficient lights
- To foster gradual phasing-out of the less efficient lights and accelerate replacement of old less efficient lights in use

Strategic objective:

- To Contribute to the reduction of greenhouse gas emissions
- To promotion energy efficiency at a national and EU level, to promote best available technologies and Energy Performance Contracting
- Improvement of energy management and efficient energy dealing on a national and EU level.

Process

Replacing obsolete outdoor lighting has to become priority for municipalities in Slovenia and Europe. This is a answer to reducing energy and green house gas emissions.

The main goal of the strategy is to realize energy efficient investments into public lightening, as a role model for other municipalities and to decrease energy consumption, costs and CO₂ emissions caused by public lightening.

In the first phase of project we developed the strategy how to reconstruct the infrastructure of public lightening. Second phase was the implementation of the action plan which was developed in the strategy. Third phase was monitoring of achieved results. Monitoring was performed by analyses of energy consumption according to the past years.

The strategy contains:

- analyses of existing situations;
- inventory of all types of lamps in Municipality of Velenje;
- action and investment plan for the period 2006 – 2016.

Financial resources and partners

Partners in the project: Municipality of Velenje, KSSENA.

The Municipality of Velenje invested over 300 000 € (mainly own resources) in energy efficient public lightening in the past 3 years. The energy Agency KSSENA provided the strategy and controlled all the actions and investments implemented over the past 3 years in public buildings.

KSSENA organized a conference about the public lightening in February 2009 in Celje. There were over 170 participants at the event which indicates the high importantst of such events and the lack of relevant information.

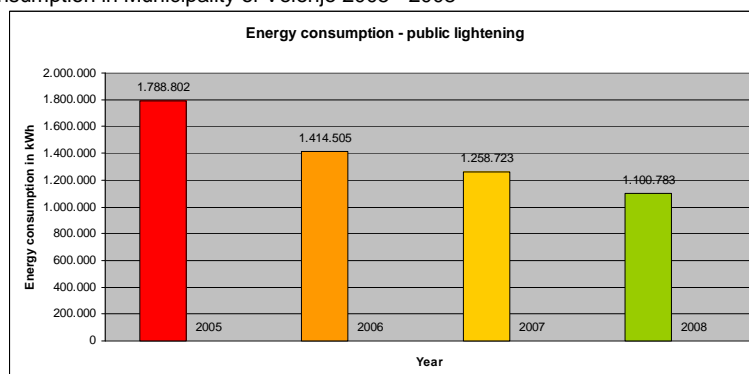


Results

In the Municipality of Velenje we changed over 1 500 public lamps into energy efficient lighting.

The most efficient change was 250 lamps á 400 W which were replaced with 150 W lamps.

Figure 1: energy consumption in Municipality of Velenje 2005 - 2008



The result of the project:

- 1 500 lamps changed with more energy efficient lamps.
- The reduction of energy consumption with 688 019 kWh in 3 years.
- Over 150 000 € saved in the past 3 years.
- Less light pollution in the environment.

In 2008 we marked every lamp in public lightening so the general public can inform about anomalies in the lamps (broken lamps, not operating, etc).

Lessons learned and repeatability

The lack of expert knowledge often leads to energy efficiency not being a priority. Problems with public lightening are often not only a problem for individual local municipalities. The core of the problem is on the other side: legal frameworks, the absence of investment money, undetermined ownership, etc. To harmonize the instructions and the methodologies on a EU level is the key to successfully achieving the determined tasks. It is essential to learn from best practices' examples where the energy inefficiency of public lightening was effectively solved. The other aspect is to exchange the experiences and the transfer of know-how among the municipalities, enterprises and other stakeholders.

Since there is constant progress with different technologies we should focusing more on LED technology, which seems to be the leading technology in the future. Creating *Public lightening development strategy for the Municipality of Velenje* was a pilot project in Slovenia. Nowadays many Slovenian municipalities create their own public lightening strategy based on the strategy used in Velenje.

It is essential for municipalities to create such strategies in cooperation with city planners, architects and energy experts to achieve the highest possible results for attractive and energy efficient public buildings.

The project was replicated in several municipalities in Slovenia, which is a good way to spread the best practice through out the country.



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