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MODERNISATION OF STREET LIGHTING IN ANDRYCHÓW

Sector: Energy efficient lighting

Timeframe: 2015

Location: Andrychów, Poland



Photo: Enis Solutions

PROJECT BACKGROUND

Andrychów (approx. 20 800 inhabitants) is located in the southern part of Poland, in the Małopolskie Voivodeship. For several years the city has been planning street lighting modernisation, among others due to significant amounts of money paid for electricity consumption. The 1st step towards more energy efficient lighting was signing an agreement with the Tauron company (lighting infrastructure owner), where the municipality leased for many years all lighting poles located on its area. Then, a public procurement was launched and a contract was signed with the company responsible for street lighting replacement. As a result Andrychów became a model for other municipalities wishing to modernise their public lighting.

PROJECT DESCRIPTION

The street lighting modernisation investment included replacement of 2 513 sodium luminaires with LED ones, which were installed on the existing supporting structures of the transmission lines and on the separate lighting lines. Selection of the luminaires was based on the requirements set in the street lighting standard PN-EN 13201 and done using Relux computer programme. In this way the project team decided on the capacity of light sources, their luminous flux and light distribution. The project included also reconstruction of the 3030-meter long cable lighting installation, replacement of 121 light

poles and lamps with new ones and installation of the PLANet lighting control system. The system is composed of the base stations ensuring communication and so called "telecells" (control and monitoring nodes) fitted to the luminaires. Selection of the number and distribution of the base stations was done using the computer analysis of wave propagation. As a result 6 base stations were installed in selected locations, ensuring good system communication within the whole city area. It is worth to highlight that 10 mobile communication stations working at similar frequencies cannot ensure GSM communication covering the same area. Possibility of installing only limited number of base stations is one of the important advantages of the PLANet system over the other solutions. Installation of PLANet base stations was followed with installation of the luminaires with the Telecell controls that were



Photo: Enis Solutions

activated on the spot. Each Telecell device contains a processor for radio communication management, lighting control and monitoring of the electric grid parameters (together with the metering unit). The luminaires are switched on using a photo sensor measuring the external light levels. Depending on the street and related lighting requirements, the luminaires are dimmed to the level which takes into consideration the margin factor and re-dimensioning of the luminaires. During the night hours the lights are additionally dimmed following the decrease of traffic intensity.

FINANCING SCHEME

The total cost of the investment came to PLN 7 million. Co-financing of PLN 3,1 million and a loan of PLN 3,8 million were granted by the National Fund for Environmental Protection and Water Management within the 1st call for proposals organised under the Priority Programme "Green Investment Scheme (GIS) part 6: Owl - Energy efficient street lighting".

PROJECT RESULTS

As a result of the street lighting modernisation implemented in Andrychów the capacity of street luminaires was lowered from 439,88 kW to 226,38 kW. Replacing sodium luminaires with LED ones, accompanied by further capacity reduction from automatic control, allowed for CO₂ emission reduction by 1 150 Mg per year. Installation of the PLANet lighting control system helped to additionally lower LED luminaires capacity by 48%. Annual financial savings achieved due to the project come up to PLN 500 000.

Replacement of the street lighting also contributed to the improved visual comfort and safety of the citizens and people passing through the city. This is possible thanks to the white light emitted by LEDs, which renders colours better than the light from the sodium lamps. The PLANet lighting control system enables further energy and financial savings coming from dimming newly installed LED lights to the levels

established in the up-to-date external lighting standards. Expanded programming possibilities allow for optimum and energy-saving exploitation of the lighting system. Using the reports database municipal staff will be able to obtain favourable price for maintenance services after the end of the guarantee period.

Andrychów qualified for the national contest for "the best lit city and municipality of 2015", which is organised by the Polish Association of Lighting Industry since 1998. The municipality received 1st award in the category of street lighting modernisation. The contest committee came to Andrychów to see by themselves how the streets lit with LED lights look like. During the award ceremony they highlighted the very large scope of the investment, as well as the additional electricity consumption reduction resulting from the implementation of the automatic control system.

DEVELOPMENT PROSPECTS

It is possible to connect to the PLANet communication systems also other devices, following the Internet of Things (IoT) concept. At present in Europe there are conducted the normalisation works, on the basis of which the data transmission method used by the PLANet system will be in future an open platform for other IoT devices. This means that the PLANet system is an open system and may be further developed, also by connecting new luminaires coming from different producers.

MORE INFORMATION

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