Procurement of energy efficient street lighting
Municipality of Župa Dubrovačka (Croatia)

**Background**

The Municipality of Župa Dubrovnik is situated in the county of Dubrovnik-Neretva in the south-east of Croatia. Situated on the Mediterranean coast, the Municipality covers an area of approximately 23 km², includes 16 towns and has a population of 6,663 people.

In September 2014, the Municipality introduced a Sustainable Energy Action Plan (SEAP) which was established as part of the Covenant of Mayors initiative. The SEAP provides the Municipality with stronger leverage when they wish to implement a green public procurement (GPP) procedure.

**Procurement objectives**

The Municipality of Župa Dubrovačka recognised the need to improve the quality of street lighting in the Municipality and wished to do so by installing a fixed lighting installation which would achieve that goal and thereby improve public safety, traffic safety and traffic flow at night.

The Municipality decided to publish an open tender which would include the replacement of the existing street light fixtures and high pressure mercury lamps, with a new and more sustainable solution. Župa Dubrovnik decided for the first time to carry out a GPP procedure, as they wished to ensure that the final solution would emit less light pollution and cause less greenhouse gas emissions than the previous system.

In May 2014 an open tender was published, the total value of which was estimated at 180,000 euro (excluding VAT).

**Criteria used**

**Subject matter of the contract:** Procurement of a lighting solution for the Municipality of Župa Dubrovačka.

**Technical specifications included the following:**

**Colour Rendering Index > 75**

The Colour Rendering Index (CRI) is an index used to quantitatively measure the ability of a light source to accurately reveal the colours of various objects in comparison with an “ideal” or natural light source (resulting in a reduction of light pollution in comparison to other more artificial light sources). Typically, light sources with a high CRI are the most desirable. The Municipality opted for the technical standard CRI > 75.

**Colour temperature (Kelvin) 3,000 – 4,000**

A colour temperature of between 3,000 and 4,000 Kelvin is best suited for street lighting as it gives a warm white colour, which has a lower light intensity than cool white LED lamps.

**General lighting-efficiency (lumen/watt) > 50**

The more lumen per watt, the more light is produced for the least amount of energy.

**Life-span (hours at L70) > 20,000 hours**

L70 is a standard in the lighting industry which demonstrates the lifespan of an LED. The life-span indicates the number of hours before light output drops to 70% of the initial output.

These environmental requirements were included as part of the technical specifications and were prepared based on
By changing to an LED lighting solution, the Municipality was able to significantly reduce its energy consumption in comparison to the previous street lighting system, where high pressure mercury lamps were used.

The Municipality calculated the energy and CO₂ emissions saved using the GPP 2020 methodology with an assumed lifetime of 25 years. This calculation was based on the 686 newly installed LED lamps and produced the following results:

The new LED lighting solution consumes 210,000 kWh per year and emits 64 tonnes of CO₂ per year. In comparison to the previous system, which was consuming 330,000 kWh and emitting an average of 100 tonnes of CO₂ a year, the new LED lighting solution has reduced the CO₂ emissions (from street lighting) by 36%, saving the equivalent of 900 tonnes of CO₂ over a 25 year period. Financially, the new LED lighting solution is saving the Municipality approximately 13,800 euro a year at today's energy price (currently 0.115 euro per kWh for street lighting). This figure does not include the savings made from the reduced need to service light fixtures.

The new solution is programmed so that the lamps do not switch on until visibility reaches the minimum illumination level for street lighting required by law in Croatia. Furthermore, the new solution reduces the power (wattage) and energy consumption in accordance with the intensity of natural lighting by an automatic controller regulation which is installed in the system.

Environmental impacts

The installation of warm white lamps and the requirement of a CRI > 75 reduced the amount of light pollution created. By changing to LED lamps, the Municipality of Župa Dubrovačka reduced air, land and water pollution which is caused by the use of hazardous mercury.
Furthermore, by opting for LED lamps and introducing measures such as programming the lighting system so that lights only came on when a certain level of darkness was reached, the Municipality reduced their energy consumption by 120,000 kWh a year, saving 36 tonnes of CO$_2$.

**Lessons learned**

As bidders appeared to be able to comply with the requirements outlined in this tender without any problems, in future, the Municipality of Župa Dubrovačka aims to include more ambitious energy efficiency award criteria and technical specifications in all of its tenders. The Municipality’s ability to carry out GPP procedures is further supported by the establishment of their SEAP in 2014.

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For more information, please see the European GPP criteria for Street Lighting and the Technical Background Report.