EVENT DESCRIPTION
Project Partner:
Santander Municipality and ESCAN

Title of the event: Santander City Working Visit

Date & location: 7th & 8th September2015.
Organiser(s): ESCAN and Santander Municipality.
Number of Participants: 15 persons from Streetlight-EPC project

Summary
This City Working Visit was organized by the Municipality of Santander and the energy consultancy Escan, in Santander with the aim to ensure an effective learning process among the cities participating in Streetlight-EPC project. During two meeting days a "shadowing" and an in-depth exchange on issues relating to EPC in the field of street lighting were developed.

The first day was carried out at Smart City Demonstration Center, El Pronillo where the perspective of Santander as a Smart City was presented, including sustainable urban mobility initiatives, the EPC project "Street lighting management of Santander city, the energy audit performed and EPC+ project. At the end of the day, we visited Sardinero Promenade to check a pilot initiative which combines LED and motion sensing technologies.

The second day of the City Working Visit was carried out in Santillana del Mar municipality, a village that has implemented Streetlight solutions among other applications. The visit started in the town hall, where Valeriano Zabala, technician of the municipality, explained the current situation regarding streetlight.

Objectives & main programme points
The purpose of this city working visit organized within Streetlight-EPC project is to share Santander's experiences, current and future projects related not only to street lighting, but also, to Smart Cities, among cities participating in Streetlight-EPC project.

The main programme points were:
Day 1:

- Santander city: initiatives related to innovation and Smart Cities, Santander Municipality.
- Sustainable urban mobility, Santander Municipality, TUS Service.

Co-funded by the Intelligent Energy Europe Programme of the European Union

- EPC project: The Street lighting Management of Santander city, Santander Municipality.
- Energy audit, Soningeo Energy.
- EPC+ Project, ESCAN.
- The Smart City project in Santander, Telefonica.
- Site visit, Sardinero Promenade.

Day 2:

- Site visit, Santillana del Mar Streetlight: energy efficiency initiatives and LED projects.

Conclusions & lessons learnt (based on stakeholder input)

Day 1:

- One of the objectives of Santander Municipality is to transform Santander in a real Smart City, improving the management and service provision of the Municipal services. Therefore, a Smart City Strategy Plan has been elaborated, analysing first the current status of the Municipal services (Diagnosis), defining the strategic goals and projects to be developed (action plan), and launching the Smart City Platform ("brain of the city") and Establishment of the Technical Office, which will be in charge of controlling and monitoring the different projects.
- Santander is considered an urban laboratory where there are more than 20.000 devices deployed and most of them are used to improve the management of several municipal services (Waste, Water, Street lighting and Traffic management) and to feed several mobile applications that have been developed and are currently used by citizens and tourists, providing, besides the specific functionality, a new communication channel with the Municipality.
- Two street lighting pilot projects have been implemented in the city, using both LED technology and financed by own resources.
    - The pilot project located at Lealtad Street consists of 14 LED luminaires and the use of a control and monitoring system, which ensures energy savings of 65%. This system allows to control and to monitor each luminaire individually and remotely.
    - The site visit was Sardinero Promenade, which consists of 20 luminaires combining LED and motion sensing technologies. By intelligently sensing activity around it, this system adjusts the lighting gradually to a maximum level when there is activity, and to extremely low levels (10%) when there is no activity at all. In this way, the system saves energy costs (more than 60% due to LED refurbishment, and reaching 85% thanks to motion sensing technology) while maintaining safety on the streets.
- The street lighting Management of Santander City is an EPC project which will be performed once the tender process is resolved. The main goals are reducing

current cost and improving street lighting management by the use of new technologies. Past and future steps of this project were presented:
    - First, approval of a non-refundable funding from the European Commission (European Efficiency Energy Fund (EEEF)) to perform the energy audit. After a tender process, it was assigned the company and performed the energy audit.
    - Taking into account the main results from the energy audit, a Street lighting Director Plan was elaborated.
    - Finally, it was also performed a financing study, to evaluate the financial viability of the EPC project.
    - At this point, it was elaborated the tender document to start the tender process and its assignment, which is expected by the end of this year.
- This is an ambitious project which includes the refurbishment of almost 23.000 spotlights (10 to 20 years old, and mainly HPS), point to point regulation, renewal of metering boxes, use of control and monitoring system, energy saving over 65% and investment of 15M€.
- The tender document of this project defines main features and conditions to be fulfilled by the ESCO to ensure the energy management (optimizing the energy consumption), the maintenance with total warranty and improvement and renewal of the current street lighting infrastructures (ornamental lighting of several characteristic buildings: Municipality, Cathedral, Porticada Square, MAS, Municipal Library, & Christmas lights). ESCO company will make the investment (15M€, 15 years) and ensures energy savings of at least 65%; whereas, the Municipality will contract the energy supply and will pay the ESCO company taking into account:
    - Maintenance costs reduction,
    - Energy savings of at least 65%.
        - If energy savings are 65%, the ESCO will receive 100% from the Municipality.
        - If energy savings are better than 65%, the ESCO will receive 100% from the Municipality. The extra savings will be shared out: 60% for the ESCO and 40% for the Municipality. (In other cities, 100% of extra savings are for the Municipality).
- Following the development of the ESCO application on the Santander project may provide important information (found problems, learnt lessons) to share within Streetlight-EPC project.
- Following the project implementation, paying attention not only to technical and economic issues, but also special attention to citizens' feelings and degree of acceptance, being the final users and who should get used to LED technology (new colour of light, new luminance levels,…).
- Energy audit is essential: accurate inventory and exhaustive energy audit are the basis of an effective EPC project. The one performed in Santander has allowed to know accurate inventory (using GIS software) and street lighting current status (310 control panels, 23.000 luminaires, lumen levels,…), including real measurements.

Additionally, after analysing all this information, several improvement proposals from different perspectives (economic, energetic and environmental) have been presented:
    - 100% LED refurbishment.
    - Adaptation of the hired tariff type.
    - Point to point regulation system, with three regulation steps:
        - From switching on to 2hours before night midpoint: 100%.
        - From 2hours before night midpoint to night midpoint: 75%.
        - From night midpoint to switching off: 50%.
    - Renewal of metering boxes and installation of control and monitoring systems.
    - Energy savings: at least 65%.
- EPC+ project fosters cooperation between smaller SMEs to create Partnerships for Innovative Energy Services (SPINS), with a minimum of 3 SMEs per SPIN.

Day 2:

- The current street lighting of Santillana del Mar consists of 1523 lighting points (5 to 20+ years old, mainly HPS). They have changed HPS to LED in the recent years, reducing power of luminaries (from 100W to 80W) and including a dimming system that allows reducing up to 40% of luminosity from 12 a.m. to 6 a.m. It is not possible to further reduce because it would not work out properly. All lighting is remotely managed (operating hours, temperature, point to point control).
- A study to replace the whole system with LED has been prepared but the result has not been very promising: even though the savings are 70%, required investment is very high. There are a lot of concrete columns, and it is necessary to change lamp accessories (arms, etc.) so the payback period is too high to be profitable (8 years). It is possible that the technology changes from LED to any other technology in that period of time. However, the refurbishment of luminaries in national roads (mainly 250W) may be profitable: payback of 4-5 years. For “Villa” luminaries, which are low (4 meters), and that do not bring any equipment, payback may be 4 or 5 years as well, but not in other cases. Technician’s view is that they should wait until LED becomes cheaper.
- As far as applications that the Municipality uses, there are regulation systems to reduce the power of the lamps. At 12 a.m. there is a dimming of 40-45% while early in the morning (6 a.m.) the luminaries are at 100%.
- They have software that allows the creation of “working groups” (1 or several lamps). Although they are controlled point to point, a stage of operation can be assigned to each group (how to regulate them). This can be done by time periods. For instance, when there is an event, the system can be programmed for those days (Christmas, etc.). They name the group and assign the features they want and the scenario created can run the amount of days that they want.
- The regulation is specified in percentage and it is possible to create as many scenarios as they need. There is a similar application for LED lighting so that they

can act on each of the lamps. There are some alarms that indicate the status: red means that there is a problem, grey indicates the luminaries are off and other colours mean different issues.

- The real saving is with presence control. The idea is a minimum of light and when there are people they switch on by groups of lamps. In rural areas this is much more profitable as there are less people. The problem is economics as it is necessary to find a distance detector and the amortization has to offset the savings. An example of Ecobase to detect 40 m has a price of 60€.
- Ever since 1992 they are improving. There is a water control service. At first, they put meters in major systems and detected where the losses could go. They have been developing more individual meters to increase the number of meters for smaller pipes. The meters are read via wifi (there is available wifi in the whole town). They have an optical sensor. Every three months the water meters (individual ones) are read. They collect the information and issue statistics of losses, adding up losses of the private meters and comparing it with the pattern. The result should be the same. If it is different, there are two options: water leaks or someone stealing it.
- Chlorine levels and deposits are also managed in the network. When they are out of parameters an order is sent. It is difficult to achieve losses below 25% but in Santillana they do have measures below 25%. They have also rolled out special LEDs for monuments, to attract tourists.

Conclusions

- Strong motivation and commitment from the city leaders are essential to drive projects forward.
- Energy audit is essential: accurate inventory and exhaustive energy audit are the basis of an effective EPC project.
- The use of new technologies are suitable for small projects/villages (Santillana del Mar) and large projects/cities (Santander).

Articles about the city working visit

- http://smart-lighting.es/ayuntamientos-europeos-debaten-en-santander-sobre-gestion-responsable-de-recursos-municipales-y-alumbrado-publico/

- https://www.esmartcity.es/noticias/reunion-de-los-representantes-del-proyecto-streetlight-epc

- http://energiadehoy.com/revista-energias-renovables/gestion-y-eficiencia-energetica/se-reunen-los-ayuntamientos-europeos-para-tratar-la-gestion-responsable-de-los-recursos-municipales.html

Pictures

Co-funded by the Intelligent Energy Europe
Programme of the European Union

Co-funded by the Intelligent Energy Europe
Programme of the European Union

Co-funded by the Intelligent Energy Europe
Programme of the European Union