An European urban transition project towards more sustainable cities through innovative solutions, in the fields of mobility, energy and digital.

Smart City

Global project

Coordination: Cartif
European grant: 18 M€
30 partners, 6 countries

Period: Dec. 2016 - Sept. 2022
Demonstrators:
Hamburg, Helsinki, Nantes

@mysmartlife_EU
https://mysmartlife.eu/

Helsinki demonstrator site

Coordination:
The City of Helsinki
European grant: 5,6 M€
7 partners

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City Infrastructures
Public lighting

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ACTION OVERVIEW

Helsinki

Smart lighting in Korkeasaari Zoo

This action was implemented by Forum Virium Helsinki in collaboration with the City of Helsinki. A full report (D 4.20), written in English in November 2019, is available at
https://mysmartlife.eu/publications-media/public-deliverables/

OBJECTIVES

- To test retrofit options to make street lighting more energy efficient
- To create smart controls for the lighting to adapt to temporary needs
- To increase comfort and safety for zoo visitors
- To connect the street lighting infrastructure with the urban platform

IMPLEMENTATION

CHALLENGE / CONTEXT

In the past few years, the technical developments in distributed lighting control systems and connectivity have led to more advanced and adaptive public lighting systems. Modern lighting is more energy efficient as it reacts dynamically to the real-time sensor data, monitoring the current environmental conditions and the presence of people.

The Korkeasaari Zoo is located on an island where the pathways have similar requirements as the public space in general. The island is open for visitors almost every day, and daylight hours vary a great deal depending on the season in Finland. Also, most of the animals stay outdoors throughout the year. Thus, several factors need to be considered: the safety of visitors, visual and technical design, expectations related to animal wellbeing and costs of the solution.

The aim of the action was to replace 40 of the island's 160 lampposts with LED fixtures with smart drivers. A programming interface (API) was created to connect the lighting network with the urban platform. The replacement of lampposts does not extend the reach of the lighting network but by deploying central controls, energy metering and visualisations, the zoo takes a step to be fully LED powered within the next few years. Ultimately, the action is supporting Korkeasaari to be carbon neutral by 2035.

PROGRESS

Requirements and ideas for the outdoor lighting were developed together with the zoo staff. Co-creation methods used earlier in the planning of street lighting for the neighbouring Kalasatama district were applied. One of the use scenarios for smart lighting was an event organised during dark hours in the autumn called Night of the Cats.

The LED luminaires may have effects that are not visible to human eye but can cause disturbance to animals. Therefore, special attention was put on selecting luminaires that would have no harmful side-effects such as flicker, glare or excessive brightness. The staff of the zoo who are experts on animal behaviour offered input for this process. In parks and in greenspaces in general, there are also additional requirements for the colour rendering.

The replacement of gas-discharged luminaire was a retrofit action: old lampposts and fixtures were equipped with new smart drivers and LED light source. While this approach was time-consuming, it provided important information about an alternative to a full replacement of lampposts. Consequently, parallel to the project, the zoo has already replaced another 20 lampposts with modern fixtures, including LEDs with conventional control.

The new luminaires were connected to a Central Management System by the C2 Smart Light system, extending the Helsinki Urban Platform. This enables the control and monitoring of a single luminaire or a group of luminaires remotely. In addition, 20 lighting and movement sensors were included to study the costs of local demand-based control versus remote schedule control.

The savings of the solution will be calculated during the monitoring phase. Since the baseline energy consumption is unclear, the monitoring phase will include energy monitoring setup to better understand the savings potential when the replacement solution has LED light sources and is dimmable. The smart drivers are capable to provide detailed information on the energy consumption of each of the light sources.

► LESSONS LEARNT

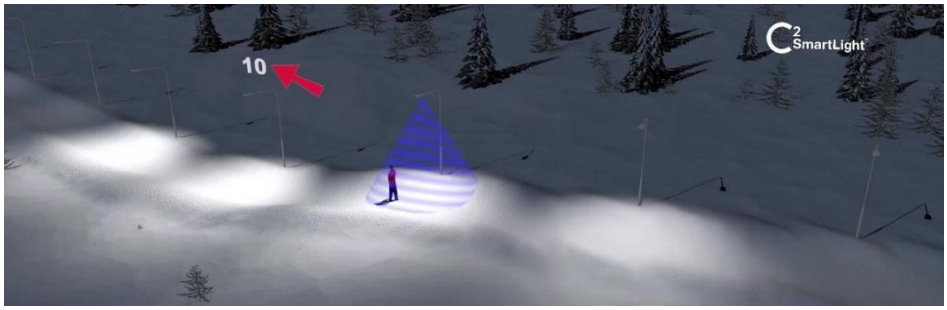
Due to the nature of the zoo operations, there was no detailed documentation of the existing lighting system. In such cases, installation tasks are time-consuming when connections need to be studied and verified before the installation can continue.

BENEFITS

Environmental
- Lower energy consumption
- Less maintenance required
- Less light pollution

Technical / Economic
- Longer lifetime
- Over 50% savings in energy costs

Users / citizens
- Improving safety and comfort



Lighting follows pedestrians (Image by C2 Smartlight)

FURTHER DEVELOPMENT

The goal of the City of Helsinki is to extend LED lighting to the whole city by 2030. In addition, there are several development projects on-going in various locations focusing on the utilisation of sensors. For example, the implementation of visitor counters in the lighting control system in the Mustikkamaa island recreational area is being studied.

In general, the street lighting network can act as a platform for sensors and other smart city components. The smart lampposts can act as electricity infrastructure for other types of equipment, such as cameras or WIFI transmitters. These future needs have to be foreseen.

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