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Procuring energy-efficient indoor lighting-as-a-service

City of Mechelen (Belgium)

Background

Mechelen is a city of 86,000 people in Belgium. The city administration views climate as a priority and is the winner of the European Green Leaf award 2020.

With Mechelen Klimaatneutraal, the city aims to take the lead in emissions reduction by setting up an ambitious climate policy to decrease the use of raw materials and energy and to produce local green electricity.

Image: City of Lappeenranta

Mechelen has been including sustainability in its general policies for over 20 years and was one of the first cities in Flanders to hire a sustainability officer. Since 2016, sustainability has also been part of the strategy and development department, which sets out the broad outlines for Mechelen.

The city views the circular economy as an essential approach for achieving sustainability goals and is exploring procurement approaches where waste can become new raw materials and where public authorities purchase a specific service instead of buying a product.

Procurement objectives

In 2017 Mechelen started plans to renovate offices to reflect the 'New World of Work'. This concept for improving workers conditions in the digital age includes reduced need for desks and more diversity of working space such as a variety of office landscapes, small and big meeting rooms, and quiet workspaces.

To make this innovative office space possible, Mechelen carried out an extensive renovation. In this process, the city reused 41% of the existing furniture and recovered 16% of the material into new furniture. The multiple workspace types each require customised lighting.

When planning for the procurement of lighting for four buildings, Mechelen wanted to explore circular and lower energy solutions. The city was looking for adequate light intensity in every room through lighting fixtures with high performance, with reduced consumption of energy and resources, and where any waste is part of a circular supply chain. They aimed to do this without the need for significant investments.

The city received a €75,000 subsidy from a call for innovative climate projects in the Province of Antwerp. The Mechelen project was called 'Leenlicht' ('Borrowed Light').

Criteria used

Subject matter of the contract:

Lighting-as-a-service for several buildings.
The procedure was carried out in two phases. The first phase was an invitation for to make an inventory of the lighting and calculation of the possible gains. The second phase assessed the quality of bids for providing lighting-as-a-service.

The goal was to conclude a 15-year contract for the lighting of several buildings from different legal entities of the Mechelen group. A law firm was consulted to add a new and more extensive set of specifications for the selection of a supplier, which include a fixed and a variable part, as well as buildings of different legal entities.

Selection criteria:

Mechelen took two main factors into account during supplier selection:

- Financial and economic strength, which is essential when procuring the service over a long framework contract
- Technical and professional competence, including descriptions of the team to work on the project and references from other customers

Three bidders met the selection criteria.

Technical specifications:

The tender specified that the operator is the owner of the light installation during its life. The operator must also guarantee the light level at all times meets the European standard EN 12464-1, which highlights the minimum luminance requirements of a working area rather than the entire room.

"If you don't buy a product but procure as a service, the supplier has every advantage in ensuring that the devices last a long time and that they are still usable after the expiry of the contract."
Alderman of Mechelen, Marina De Bie

A site visit and delivery of a study using software that plans, maps and visualises lighting proposals were mandatory. The execution of the study by the three selected bidders was a new element in these specifications. Each bidder carried out an inventory of the existing light fittings and used the software to prepare and send a proposal of solutions and technical drawings to Mechelen. The plans included the locations of the lighting solutions, what they suggest for the LED light to meet the standard and the guaranteed returns over the contract period. Using these three studies, Mechelen calculated an average on which to base the assessment of the final quotations, ensuring that the proposals were comparable in approach and price. The subsidy from the Province of Antwerp funded the design of this study, with the winning bidder receiving €32,000 and the two other bidders each receiving €5,000.

Award criteria:

The award criteria were weighted as follows:

- Availability fee per building 100

  The cost-benefit of lighting-as-a-service per building, calculated by comparing energy bills (including index and inflation) and maintenance costs over the duration of the contract to the proposed service fees of the bidder. The price the city has to pay to the provider per year over the 15 years. The supplier with the lowest price scored 100 points, and the other bids received fewer percentage points.

- Lighting plan proposal technical concept 10
- Proposal for offered light fittings: quality of material and appearance 10
- Proposal for a maintenance plan: maintenance of installed luminaires and guarantee of light level 30
- Execution deadline: delivery and installation of light fittings (planning per building) 10
- Circular economy: the plan of approach at the beginning and during the execution of the contract 10
- Circular economy: the plan of approach at the end of the contract - continuity of service provision 20
- Training of users and technical maintenance personnel 10

Contract performance clauses:

Contract clauses that relate to the GPP of the procurement included:

- In the event of a malfunction or a breakdown during its lifetime, a performance reduction mechanism shall be triggered.
- Maximum re-use of devices/materials/compounds shall be provided.

Results

All three selected candidates submitted a valid offer (including the mandatory site visit and the DIAlux study), meeting the technical and the award criteria. Trilux won the bid for a 15-year contract, with a total cost of almost €400,000.

Once the supplier was known, the approach helped the city to decide whether to upgrade a particular building or not within the lighting-as-a-service contract. The data provided allowed Mechelen to assess if entering into a lighting-as-a-service contract pays off over the years for a particular building. For example, the specifications included lighting for a nursery, but the availability fee over the 15 years would cost more than purchasing the lights, taking into account the current and future price of energy, due to the low burning hours in this building. LED lighting has replaced fluorescent and energy-saving lamps. In some rooms, the number of light fixtures has reduced, and in others, the number has gone up to meet the lighting standards.

Environmental impacts

Over 90% of the environmental impact of lamps comes from the in-use phase via energy consumption and associated greenhouse gas emissions (Source). The LED technology is highly efficient, requiring significantly less energy to produce the same level of lumens, in addition to having a longer bulb life-span. Reductions in upfront costs and further improvements to efficiency are also expected to continue as LEDs importance in the global lighting market rapidly continues to grow (Source).

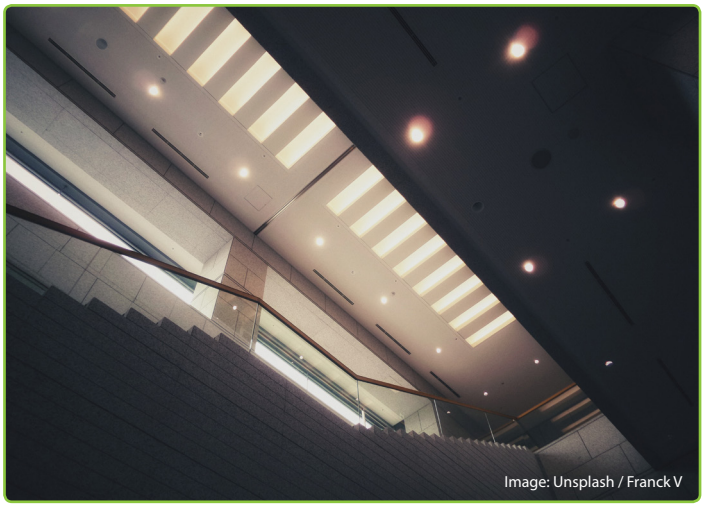
Image: Unsplash / Franck V

According to the estimation of the winning supplier, the relighting of the four selected buildings reduces the CO_2-emissions of the city by almost 10 tonnes per year, reaching potentially 150 tonnes CO_2 over the course of the 15-year contract. Mechelen bases the figures on a savings potential of 50,477 kWh per year of the four buildings together, which is approximately 14,994 euro per year of energy (taking into account energy price rises). Using a conversion factor of 0.19 kg CO_2 per kWh, the new lighting fixtures provide a 9591 kg (or 9.6 tonnes) of CO_2 emission per year reduction.

Lessons learned

'Offering products as a service has been around for a while, but remains a niche story. However, it is an integral part of the transition to a circular economy. If you don't buy a product but procure as a service, the supplier has every advantage in ensuring that the devices last a long time and that they are still usable after the expiry of the contract' Alderman of Mechelen, Marina De Bie.

Although the sustainability department and the public procurement service were actively involved in the process, it was essential that the facility department took the lead in this process. Convincing all departments that the switch to lighting-as-a-service is the way to go was only possible because of the focus on the functionality and specific needs of every room and every building.

Lighting-as-a-service is not a common practice yet, so it is essential to invest time and effort to convince suppliers to offer these kinds of services.

An important focus for the city council was that the switch to lighting-as-a-service had to be budget neutral, which was feasible because the new light fixtures consume low amounts of energy, and the supplier is responsible for all maintenance. Because of this requirement, Mechelen mainly chose public buildings that are open on weekends, such as cultural centres, where the lighting hours are long. The city also accounted for the rising electricity prices in Belgium.

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