

Purchasing energy efficient street lighting

City of Rotterdam (The Netherlands)

Background

The City of Rotterdam is the second largest city in The Netherlands and has a population of approximately 610,000 people.

The City has a [Lighting Plan](#) in place since 2012. The primary task of public lighting is to guarantee traffic safety on the streets and community safety in the public domain. The lighting plan accommodates the following three specific policy ambitions of the municipal government:

1. To achieve a better design-quality of both dayscape and nightscape in order to improve public space.
2. To achieve more efficient maintenance by introducing standardisation in lighting equipment and poles.
3. To reduce energy levels and light pollution by applying technological innovations which contribute to sustainability on a city-wide scale.



Procurement objectives

Each night, approximately 106,500 light sources illuminate the City of Rotterdam's roads, cycle paths, pavements and shopping areas. In the past, maintaining these light sources required the replacement of approximately 4,000 light fixtures at the end of their life cycle each year. Also, as there was little or no consistency as regards the types of light fixtures and lamps installed, carrying out maintenance and repair work was expensive and time consuming.

Therefore, the City of Rotterdam published a tender in 2012 for the purchase of standard lighting fixtures for the whole city for the period 2013 to 2020. The form of the tender was an e-auction in three lots, with one framework agreement for each lot. The City wanted to ensure that sustainability was considered in all aspects of the production process, i.e. from the sourcing of raw materials to the end of the products life, and therefore requested that the light fixtures contain recycled materials and be recyclable at the end of their product life.

Criteria used

Subject matter of the contract:

The tender is for the replacement of a total of 30,000 fixtures, within which there are three types of fixtures divided into three lots. Each supplier has its own fixtures with its own specifications. In order to ensure that the sustainability aims of the tender were met, the requirements included design, robustness, durability and reuse of the materials of fixtures. Only LED-fixtures were permitted. To ensure longer term uniformity of light fittings in city, the contract duration is four years with a possibility to extend it for up to eight years.

Technical specifications:

The environmental technical specifications included:

- Individual components should be removable and replaceable
- Packaging should not be excessively large and should be stackable
- The armature must have a minimum design life of 20 years

Selection criteria:

Selection criteria were specified, with suppliers who met the minimum requirements then allowed to submit their bids via an e-Auction process.

These criteria included:

- Experience in delivering street lighting projects
- Provision of reusable materials in the fixtures
- LED lamps only would be considered
- Meeting of 6 social conditions

E-auction process:

The City accepted bids by an e-auction. The e-Auction was hosted by a third party agency in the Netherlands, using a system which allowed suppliers to submit a new bid every three minutes. When no more bids were submitted the auction ended. By lowering their prices offered (and by scoring better on social return and TCO criteria) the bidders competed for the lowest Most Economically Advantageous Tender (MEAT) score, which determined who would be awarded the contract.

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Award criteria:

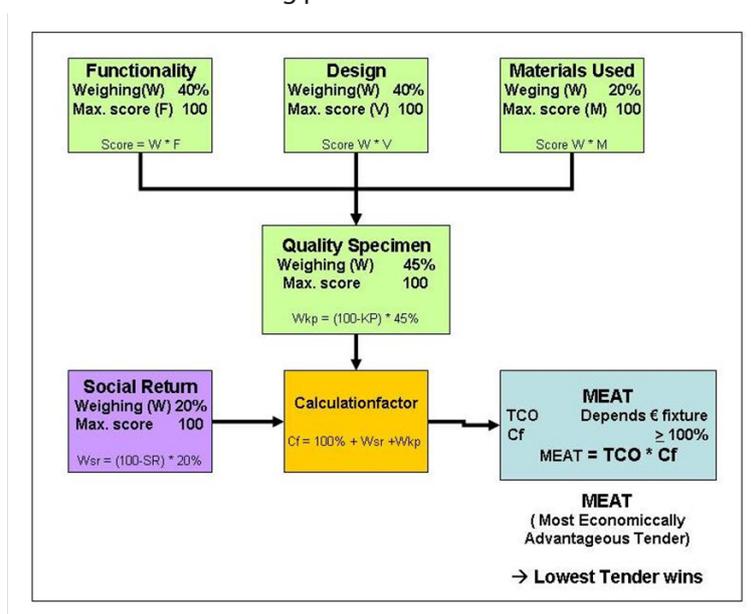
Bidders were provided with a description of three fictional street sections. The fictional streets were 1,200 meters long, with varying widths. Each fictional street was required to receive street lighting in conformity with the [Dutch street lighting guidelines](#). As part of the tender, bidders were asked: *how many fixtures would be needed to light each section?* Bidders were required to show the number of their fixtures that would be required to properly illuminate the street sections, based on the specifications of their fixtures. The results of these calculations were used as parameters for calculating the total cost of ownership (TCO). For example, a more expensive fixture could be more advantageous if its superior performance means that fewer of them are required. The specifications and calculations provided by the supplier were tested in an independent laboratory, commissioned by the City of Rotterdam.

The required number of fixtures to properly illuminate the fictional street section, the price of the fixture at e-auction, the LED light source and the driver, and the energy consumption and maintenance costs over a period of 20 years were all assessed and resulted in a calculation factor to determine the TCO, which in turn allowed for determining an initial MEAT to form the baseline for the tender.

The tender was awarded based on the most economically advantageous tender according to the following award scheme:

- Functionality – 40% of the total points awarded
- Design – 40% of the total points awarded
- Materials used – 20% of the total points awarded

The figure below shows the award criteria and scoring process.



Contract performance clauses:

In the specifications it was demanded that all parts of the fixtures are recyclable.

Results

After the registration and evaluation of the delivered documents and samples, six suppliers were admitted to the e-auction. The result of this tendering procedure with an e-auction was that contracts were concluded with two suppliers (one supplier won two lots). The prices of the LED fixtures were almost the same as previously paid for conventional light fittings, with the advantage of providing optimum performance in the field of lighting, energy consumption and social return. Energy savings will depend on the deployment of the fixtures across the city, with priority given to replacing existing sodium fixtures with higher energy consumption where the savings can be up to 35%. Depending on the use of the fixtures and deployment, the contract value will be between 8-10 million euros.

Environmental Impacts

Lighting can have environmental impacts at a number of different stages in its life:

- a) Production. This includes extraction of raw materials (resources) and manufacture of the lamps, luminaires and ballasts, which involves the use of hazardous substances.
- b) Distribution. This covers emissions from transport, and the use of packaging.
- c) Use. This is principally carbon emissions from the energy used by the lighting.
- d) End of life. This could include release of chemicals such as mercury following disposal of lamps and waste management.

By changing to LED over the course of the framework agreement, the City of Rotterdam hopes to reduce its energy consumption. From 2012 (the baseline year before the framework agreement began) to 2015, the energy consumption from street lighting reduced from 25.6 million kWh per year (2012 baseline figure) to 23.2 million kWh per year, resulting in a cumulative saving of 1,262 tonnes of CO₂e in the period.

Lessons learned

The preparation requires a lot of time. The expertise and knowledge of needs lies within the relevant city departments, so you have to allow sufficient time to collect this knowledge and transfer it into a quality tender. This includes consideration of specification, models of delivery and the use of external experts.

The city considered it essential that the samples of the fixtures were tested in an independent laboratory. The suppliers had to trust that the process was objective so that it was not open to challenge.

The e-auction is a way of tendering the city plans to use again. What will change is that each new bid will be submitted with a minimum amount less than the one before. This auction lasted for 3 hours, because one of the bidders lowered its bid each time with 1 euro which slowed the process. Next time the parameters will be set at 1,000 euro reductions, which is a more suitable and less time consuming amount for the size of contract.

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