

Sustainable Reconstruction of the Motorway A6

Procura+ award winning tender



Procura+ Participant:	Rijkswaterstaat
Contract:	Sustainable Reconstruction of the Motorway A6 Almere-Havendreef Awarded: June 2016
Savings:	CO ₂ : 52,800 t CO _{2e} (1,056 t CO _{2e} /year) Energy: 15,038 toe (301 toe/year)

SUMMARY

- Road construction traditionally uses a large amount of primary resources, and the transport, processing and servicing of these results in CO₂ emissions.
- In 2015, Rijkswaterstaat released a Design, Build, Maintain, Finance (DBMF) project worth €300,000,000 (over 30 years) for the sustainable reconstruction of motorway A6.
- In 2016, the contract was awarded to the Parkway6 consortium (Dura Vermeer, Besix, John Laing and Rebel Group) for innovative use of materials with incorporation of additional solar generation facilities.
- By developing calculation tools and monetizing sustainability improvements in the procurement, the winning tender halved CO₂ emissions and energy consumption related to materials and service over the lifetime of the new road.

Background

The Netherlands aims to achieve a 20% reduction in CO₂ emissions by 2020, compared to 1990 levels, and has a target of 14% renewable energy production by 2020, compared to 2% in 2010.

To support these targets, in 2010 the Dutch House of Commons also set the goal that all public authorities in the Netherlands must implement 100% sustainable procurement as of 2015 (via the inclusion of green criteria in all tenders).

Rijkswaterstaat is the Department of Public Works within the Dutch Ministry of Infrastructure and the Environment. It has an annual budget of €3.5 billion and is the biggest investor in infrastructure in the country. It employs around 8,500 people and manages the main waterways, coastal water systems and motorways in the Netherlands.

In 2015, Rijkswaterstaat published a Design, Build, Maintain and Finance (DBMF) contract to widen a 13km stretch of road between Almere Havendreef - Almere Buiten Oost and maintain this during a 20 year operation phase. This project is part of wider improvements to the SAA corridor (Schipol-Amsterdam-Almere) which aim to improve traffic flow and road capacity.

Procurement Approach

Rijkswaterstaat uses a 'Economically Most Advantageous Submission' (EMAS) procedure to select tenders on the basis of price and quality, which in this project was assessed on a risk management plan, a traffic congestion restriction plan, and sustainability.

Rijkswaterstaat assigns monetary values to quality aspects. These values are then subtracted from the actual offered price to provide a 'corrected total price' in which environmental impacts are also accounted for. The bidder with the lowest 'corrected total price' will win the contract.

Criteria used in the procurement process

Award criteria

Two instruments have been developed by Rijkswaterstaat to assess and monetize sustainability in the awards phase:

1) The CO_{2e} Performance Ladder. This certification system which allows bidders to show measures taken (or to be taken) to limit CO_{2e} emissions within the company, its projects, and its supply chain.

It is used to adjust total price by evaluating the estimated emissions from the proposal against a series of levels, or 'rungs', with each successive performance rung providing an additional 1% deduction to the final offer price. A maximum of 5% can be deducted to from the total price.

2) DuboCalc: this Life Cycle Analysis (LCA) tool calculates the Environmental Cost Indicator (ECI) or the sustainability of the materials required in a particular design (based on standardised values from the National Environment Database), allowing bidders to test different design options and maximise the sustainability of their offer. The lower ECI value, the lower the environmental cost.

Using DuboCalc, Rijkswaterstaat can also assess the impact of proposed materials, including groundwork, pavement, underlayers, interlayers and coatings. The project team set a maximum ECI value of 12,000,000, but based on professional experience expected that the most optimal design could only reach a 50% ECI value. For those bids which met this score, a (fictional) €10,000,000 would be deducted from the bidding price. Bids that exceeded the maximum would receive no deduction, and bids in between would receive a deduction in proportion to the ECI value.

By monetizing efforts to reduce environmental externalities, Rijkswaterstaat is able to assess and select a provider on the basis of more holistic information on cost and quality.

Contract performance clauses

The materials proposed by the successful bidder become contract requirements, and the ECI value of the final product is checked after one year of the contract close, with the results of this assessment re-informing the Life Cycle Analysis data on which DuboCalc is based.

The measures included in the CO_{2e} Performance Ladder also become part of the performance requirements of the contract, which must be assessed one year after the start of the contract by certified authorities.

Results

The winning tender proposed the work at a price under €200,000,000 at a quality which reached the fifth rung of the CO_{2e} Performance Ladder and met the optimal ECI score. It achieved this quality via:

- smart construction transportation solutions which reduced the need to transport materials by road;
- Smart use of asphalt, which lowered the required quantity; and,
- Use of recycled materials, which reduced the need for primary raw materials,

Sustainability impacts

There are a wide range of environmental impacts associated with road construction and other infrastructure projects such as building tunnels and bridges. The extraction and processing of raw materials using mining operations and refining ores can cause the physical disturbance of land and water courses and the pollution of land, water and air. The manufacturing and processing of materials such as concrete, cement, asphalt and bitumen have high energy requirements, especially as they are required in such high volumes. The transport of materials to and from site causes local air pollution and greenhouse gas (GHG) emissions and the construction phase itself can cause habitat destruction and a loss of biodiversity at the site. After a road has been completed, impacts include environmentally damaging rainwater run-off arising from tyre abrasion, fuels, lubricants and road surface treatments. When road surfaces need maintaining or replacing, waste materials from the surface layer is generated.

For these reasons, RWS have found ways to look at contractors' approaches to controlling overall emissions through the CO_{2e} Performance Ladder, as well as the wide range of environmental impacts associated with the materials included in the design through DuboCalc.

CO_{2e} emissions are one of the 13 parameters that contribute to the ECI Value, and in this project, comprised 44% of the total ECI Value (as calculated against a reference design).

The winning design for reconstructing the A6 motorway met the optimum ECI score of 6,000,000, which equals a saving of 52,800 tonnes of CO_{2e} emissions, or 15,048 tonnes of oil (toe) equivalent over the life time of the project (or annual savings of 1,056 CO_{2e}/year and 301 toe/year).

Lessons learned

Due to the success of this tender, Rijkswaterstaat will continue to use this method in future large infrastructure tenders. Due to the relative complexity of the tool, a focus on larger and more important projects will lead to more significant results.

Bidders should have the flexibility to experiment to find optimal sustainability. As such, they should only be provided with functional requirements and technical framework conditions, and specification of particular materials etc. should be avoided.

In order to set a maximum ECI Value, and judge the tenders accordingly, it is necessary for the client to have a good reference design for comparison. As such, application of DubloCalc requires expertise (environment, materials and civil engineering).

The gains (i.e. reduction of carbon emissions) should outweigh the increased cost of tendering. A sensitivity analysis may be necessary to assess this.

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Procura+ Participant page

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About Procura+

Initiated and co-ordinated by ICLEI, Procura+ is a network of European public authorities and regions that connect, exchange and act on sustainable and innovation procurement.

Connect.



We are a network of European public authorities that connect, exchange and act on sustainable and innovation procurement.

Exchange.



Our combined knowledge and experience allows us to provide advice, support and publicity to any public authority that wants to implement sustainable and innovation procurement.

Act.



The Procura+ Network joins forces to champion sustainable and innovation procurement at the European level.

www.procuraplus.org



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