Reconstruction Motorway A6 Almere
Rijkswaterstaat, The Netherlands

- The new tendering method that aims to reduce CO₂e emissions was applied in this tender of an infrastructural work.
- Tendering parties were stimulated to offer a lean design and to apply innovative materials and working methods.

<table>
<thead>
<tr>
<th>Standard tendering</th>
<th>GPP 2020 tender</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>105,600 t CO₂e emissions</td>
<td>52,800 t CO₂e emissions</td>
<td>52,800 t CO₂e emissions reduction in 50 years</td>
</tr>
<tr>
<td>30,096 toe energy consumption</td>
<td>15,048 toe energy consumption</td>
<td>15,048 toe energy savings in 50 years</td>
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www.gpp2020.eu
Contract tendered
The reconstruction of the motorway A6 Almere is one of the five subprojects of the SAA-program (Schiphol – Amsterdam – Almere). The SAA corridor is located in an economically important area that should be easily accessible. The objective of the SAA program is to improve the flow on the corridor by expanding the road capacity to ensure that good accessibility of the region can be continued to be guaranteed and to also improve the living environment. The A6 Almere Havendreef—Almere Buiten Oost is the fourth SAA project and forms the third SAA DBFM Agreement. The A6 Almere project must be ready before the opening of Floriade in 2022.

The contract is a Design, Build, Maintain and Finance contract DBFM). The tender was prepared and executed under the leadership of Rijkswaterstaat.

The project consists of all works, supplies and services that need to be carried out in relation to the widening of the A6 motorway over a length of approximately 13 kilometres. The DBFM Agreement has a laying and a maintenance component. Specifically, the building scope mainly focuses on:

1. The capacity expansion from 2x2 to 4x2 with a main and parallel lane structure;
2. Good and user-friendly intercommunication passages and link-up with the underlying road network;
3. The lowering of the A6 and the moving of the Almere Port connection to two half connections;
4. Keeping space for future area development.

The building work also includes:
- noise measures;
- mitigating and compensating measures for nature and forest in addition to route and interchange changes,
- other infrastructural facilities such as the underlying road network and cycle paths.

The DBFM Agreement also contains a maintenance obligation during the construction phase and the operation phase of 20 years. The maintenance scope mainly focuses on paving and marking, engineering works, greenery and sites.

Time schedule of the tender procedure
- Selection Phase: March 2015 - 21 April 2015
- Delivery of Submission (qualitative part): March 2016
- Delivery of Submission (quantitative part): April 2016
- Completion: (one Candidate)
- Contract Close: June 2016
- Financial Close: July 2016

The design life time for calculation in DuboCalc is 50 years.
Estimated total costs (ceiling price): €200,000,000,-
Procurement approach

The Dutch Government wants to reduce the emission of CO₂e by 20% in 2020 compared to 1990. Sustainable procurement is one of the methods by which this can be achieved. Rijkswaterstaat (the Dept. of Public Works of the Ministry of Infrastructure and the Environment) developed a methodology for infrastructure projects whereby the functional specification of the tender together with the quality input from the client ensure an innovative and high-quality solution. This methodology will contribute to the reduction of CO₂e emissions and other environmental impacts caused by materials used in infrastructure projects.

Tendering based on functional specifications

Rijkswaterstaat (RWS) strives to commission procurement projects as far as possible based on functional, performance-based specifications of the required infrastructure so that the market has the optimum freedom to arrive at effective, alternative and innovative solutions.

Most Economically Advantageous Tender (MEAT)

The ‘Most Economically Advantageous Tender (MEAT)’ procedure means that RWS selects tenders on the basis of a combination of price and quality. Quality includes for this project:

- Risk management plan
- Traffic congestion restriction plan
- Sustainability
  - CO₂e performance ladder
  - DuboCalc

RWS assigns a price to specific quality aspects. This value is subtracted from the actual offer price to yield a corrected ‘total price’. The more effort the bidder makes to improve the quality of the bid, the higher the monetised value that will be deducted from his actual offer price. The tenderer with the lowest ‘total price’ wins the tender.

By applying these sustainability criteria Rijkswaterstaat shows that it want to select a provider with a) an energy efficient Working Processes who also offers b) a product with a high Product Quality (being a low environmental impact).

Sustainability as quality aspect

RWS has decided to focus on two criteria when assessing the sustainability attributes of offers, work processes and associated products: CO₂e emissions and environmental impact. Two instruments have been developed for these two aspects: the CO₂e performance ladder and ‘DuboCalc’ respectively.

The CO₂e performance ladder is a certification system with which a tenderer can show the measures (to be) taken to limit CO₂e emissions within the company and in projects, as well as elsewhere in the supply chain. See www.skao.nl

DuboCalc is an LCA-based tool which calculates the sustainability value of a specific design based on the materials to be used. Bidders use DuboCalc to compare different design options for their submissions. The DuboCalc score of the preferred design is submitted with the tender price. For more information see:

- [http://www.youtube.com/watch?v=cAaL4FBQNCc](http://www.youtube.com/watch?v=cAaL4FBQNCc)
- [http://www.youtube.com/watch?v=LJYqQzxlW2w](http://www.youtube.com/watch?v=LJYqQzxlW2w)
- [https://www.milieudatabase.nl/imgcms/SBK_Assessment_method_version_2_0_TIC_versie.pdf](https://www.milieudatabase.nl/imgcms/SBK_Assessment_method_version_2_0_TIC_versie.pdf)
The Environmental Cost Indicator (ECI value) indicates the environmental impact of a particular design for civil engineering works. A lower value indicates a lower environmental impact. Designs that differ significantly from each other in terms of material use also differ in terms of environmental quality. DuboCalc enables designers to calculate ECI values of alternative designs to arrive at an optimally sustainable design.

Sustainable procurement:
To ensure sustainable procurement, RWS carries out tendering procedures as follows:

- Energy consumption is included where possible as part of the submission price, in order to create a direct stimulus for energy efficiency.
- Specific technical solutions for energy saving and sustainability are obligatory. For instance, in tunnels LED lighting is always required. Another example is that only sustainable timber is allowed.

Criteria development

- The CO2e Performance Ladder was applied to this tender. According to the green procurement policy of Rijkswaterstaat every rung of the ladder yielded an extra one percent fictional deduction of the bidding price. The highest rung (rung 5) yields 5% extra fictional deduction from the bidding price.
- A reference design was made to estimate the quantities of materials applied in this project. These quantities were used to calculate the reference ECI Value.
- The scope of the DuboCalc calculation is groundwork, pavements like foundations, underlayers, interlayers and coatings. Also all infrastructural objects like over- and underpassings are part of the DuboCalc scope.
- This resulted in an (maximum) ECI Value of 12,000,000 for a design with a life time of 50 years. According to their professional knowledge the project team expected that the most optimal design could have an ECI Value of 50% less. This means an ECI value as low as 6,000,000.
- The project team decided that a maximum deduction of the bidding price of 10,000,000,- would be applied for green procurement purposes in this tender. This meant that the bidder that could make the work with an ECI Value of as low as 6,000,000 would be awarded with a – fictional - deduction of the bidding price of 10,000,000,-. A design that scored 12,000,000 would have no deduction from the bidding price. Other ECI Values would result in a deduction proportional to the ECI Value.
- Assessment of the offers:
  - CO2e emissions are one of the 13 parameters that contribute to the ECI Value. The CO2e emissions are a result of all processes involved; production, transport, construction, demolishing, re-use, etcetera of all the building materials.
  - In this project 44% of the ECI Value is caused by the emission of CO2e. The amount of CO2e emission that is reduced was calculated by subtracting the ECI Value of the offered design from the reference design.
- Recently added to new tenders is the (explicit) possibility to deliver the Life Cycle Analysis (which is compulsory) of new materials to be used in the project, one year after contract close. This used to be a few months causing a deterrence effect at the bidders to use new materials.
Results

<table>
<thead>
<tr>
<th>Low Carbon Solution</th>
<th>CO₂e emissions</th>
<th>Energy consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,056 t CO₂e/year</td>
<td>301 toe/year</td>
</tr>
<tr>
<td>Last Tender/or „worst case“</td>
<td>2,112 t CO₂e/year</td>
<td>602 toe/year</td>
</tr>
<tr>
<td>Annual savings</td>
<td>1,056 t CO₂e/year</td>
<td>301 toe/year</td>
</tr>
<tr>
<td>Total savings</td>
<td>52,800 t CO₂e</td>
<td>15,048 toe</td>
</tr>
</tbody>
</table>

- The new procurement method was successfully applied.
- The winner offered a bidding price of less than €200,000,000,-
- The winner offered to perform the work under the regime of the fifth rung of the CO₂e Performance Ladder.
- The winner offered an ECI Value of 6,000,000. This was the maximum. It assured him of the maximum fictional deduction of €10,000,000,-.
- The gains in ECI Value were:
  - Smart construction transportation solutions, reducing the need of transport on roads.
  - Smart use of asphalt, resulting in a lower amount of asphalt needed.
  - Use of recycled materials, reducing the need of primary raw materials.
  - Utilise the opportunity of using new materials which are not added yet to DuboCalc and the underlying Environmental Database. Certified Life Cycle Analysis need to be delivered within a year after contract close.

- Emissions reduction
  - An ECI Value of 50 equals 1 tonne of CO₂e emission.
  - The amount of CO₂e emission that is reduced can easily be calculated by subtracting the ECI Value of the offered design from the reference design.
  - The calculated ECI Value for the reference design is 12,000,000 for a design life time of 50 years. This equals a CO₂e emission of 105,600 t, or 30,096 toe energy. Which is 2,112 t CO₂e emission, or 602 toe energy each year.
  - The winner offered in the tender an ECI Value of 6,000,000, which equals 52,800 t of CO₂e emission, or 15,048 toe energy. Which is 1,056 t CO₂e emission each year, or 301 toe energy each year.
  - This procurement method yielded 52,800 t less emission of CO₂e over a period of 50 years, or 15,048 toe energy. This is 1,056 t less emission of CO₂e each year or 301 toe each year.

Lessons learned
- The procurement method was applied successfully and Rijkswaterstaat will continue applying this method in the coming tenders.
- The bidders must have the freedom to make their own choices, so they should only be provided with functional requirements and technical framework conditions. The market appreciates this approach.
• The client must have a well-thought-out reference design and know where there is room for improvement in order to predict a maximum ECI Value.
• The gains of this tendering procedure should justify the costs; i.e. the reduction of carbon emission should outweigh the tendering costs. It is therefore necessary to perform a sensitivity analysis to assess this.
• Tenderers where challenged to design a motorway with a 50% lower ECI than the reference model created by Rijkswaterstaat.
• 1 out of 3 tenderers made a bid with such a sustainable design. Thus the minimum was chosen wisely.
• Particularly good use of the possibility to deliver the Life Cycle Analysis (which is compulsory) of new materials to be used in the project, one year after contract close.

Contact
Jeroen van Alphen
Advisor Materials and Circular Economy
Jeroen.van.alphen@rws.nl
Rijkswaterstaat (Dept. of Public Works)
Ministry of Infrastructure and the Environment
Sites:
http://www.duurzaamgww.nl/
Tender accessible at: http://tinyurl.com/n3ggeq4
About GPP 2020

GPP 2020 aims to mainstream low-carbon procurement across Europe in support of the EU’s goals to achieve a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020.

To this end, GPP 2020 will implement more than 100 low-carbon tenders, which will directly result in substantial CO₂ savings. Moreover, GPP 2020 is running a capacity building programme that includes trainings and exchange. – www.gpp2020.eu

About PRIMES

Across six countries in Europe; Denmark, Sweden, Latvia, Croatia, France and Italy, PRIMES project seeks to help municipalities overcome barriers in GPP processes, many of which lack capacity and knowledge.

PRIMES aims to develop basic skills and provide hands-on support for public purchasing organisations in order to overcome barriers and implement Green Public Purchasing. This will consequently result in energy savings and CO₂ reductions. – www.primes-eu.net

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

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