Rijkswaterstaat
Ministry of Infrastructure and the Environment

Vejdirektoratet
Danish Road Directorate

AGENTSCHAP
WEGEN &
VERKEER

Market consultation report

Summary of results

Dimmable LED Lighting Programme

Joint procurement by

- **Dutch Department of Public Works of the Ministry of Infrastructure and the Environment (Rijkswaterstaat)**
- **Danish Road Directorate of the Ministry of Transport and Building (Vejdirektoratet)**
- **Flemish Agency of Roads and Traffic of the Ministry of Transport and Public Works (Agentschap Wegen en Verkeer)**

Colofon

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1. Introduction

First of all, the Dutch Department of Public Works of the Ministry of Infrastructure and the Environment (Rijkswaterstaat), the Danish Road Directorate of the Ministry of Transport and Building (Vejdirektoratet) and the Flemish Agency of Roads and Traffic of the Ministry of Transport and Public Works (Agentschap Wegen en Verkeer) would like to thank all the participants in the market consultations by putting effort in evaluating the provided documents and responding on the questionnaire. The Dimmable Led Lighting team highly values your efforts.

The first market consultation was held on June 28, 2016. In total 60 people from 42 companies attended the plenary session. The responses from the participants were very promising, with participants varying from suppliers of components and luminaires to contractors.

The second market consultation was held on September 14, 2016 in Amsterdam, the Netherlands and on September 16, 2016 in Copenhagen, Denmark. The objective of the second market consultation was to offer interested market parties the opportunity to propose their ideas and possible solutions and to check the interest for market parties for a tender regarding lighting replacement. During this second market consultation the road authorities requested participants to present their ideas and solutions for the low life cycle cost challenge to the road authorities in a face-to-face setting of 30 minutes (including 10 minutes Q&A). In preparation for these face-to-face presentations, a questionnaire and an overview of archetypes were published. In total 20 (consortia of) companies responded with a filled in questionnaire. The main points of the questionnaire will be qualitative discussed in this document, and quantitatively in *Annex 1*. Participants were also requested to deliver the following documents:

1. Lighting simulations for each reference project/ archetype
    a. Basis incl. maintenance factor relating to service interval
    b. Results incl. yearly energy consumption per km
2. Total cost of ownership for reference project/ archetype
    a. Initial investment
    b. Service interval and costs
3. Product documentation
    a. Lifetime and reliability of driver and LED-module (in the luminaire)
    b. Commissioning , serviceability and maintenance
    c. Datasheet
4. Control- and monitor system
    a. System overview
    b. Control functions
    c. Monitor functions
    d. Communication standard
    e. Access control and safety

Due to the confidentiality of these documents and the information which was presented during the face-to-face presentations, the outcome of these requested documents and the content of the presentations will not be discussed and distributed. No rights can be derived from this document.

2. General conclusions

The road authorities look back at two successful and fruitful market consultations. A lot of market parties participated in the market consultation by giving input to the challenge: to replace lighting which has reached the end of life span along (parts of) the national roads and highways of the Netherlands, Denmark and Flanders by low life cycle cost dimmable LED lighting which offer, taking the entire life cycle cost into consideration, better value for money. The provided input met our expectations and were sufficient to determine our next steps. Furthermore the participants presented themselves.

The participating (consortia of) companies vary from mere suppliers of luminaires, components or CMS (Central Management Systems) to project managers which could take over the responsibility for the lighting (PPP/ LaaS). Please refer to *Annex 1, Graphic 2* for an overview of the types of organizations. All participants mentioned that they are interested to participate in our upcoming tender.

3. Key findings

The following results are based on the questionnaire response of the participats.

3.1Theme: Interest

- *Q1 Willingness to submit a bit*

The participants were asked if they would be interested to submit a bit once the road authorities submit a request for tender in – indicative – Q2 2017. All the participants have said to be interested in submitting a bit.

- *Q2 Factors which influences the willingness to submit a bit*

The participants were asked to mention the factors which influence the willingness to submit a bit. Please refer to the table below for the results.

Factors
Constitute a suitable consortium
Time scale (of the program)
Volume of the project
Experience in conducting major PPP projects
Possibility for funding
A high number of luminaires with good quality
Capability to achieve performance and control system requirements
Open mindset towards (real) innovation / high technical solutions
High-level technical requirements supported by test reports performed in certified laboratories for any test listed in the product standards
Long lifetime cycle >80.000h
The alignment of the solutions to the requirements
Request for quotation (lowest price, price to quality ratio, BVP)
The possibility to mitigate the risks and liability
EMVI mechanism (not only the lowest price)
Tender process (opportunity to show innovations)
Contract period
Contract type
Available budget
Financing conditions
Feasibility of the demands, warranty, availability, recovery period and penalties
The tender should offer a fair opportunity to all lighting suppliers who can demonstrate innovation and the best whole-life costing to the road authorities

- *Q3 Willingness to form a consortium*

Participants were asked if they would like to form a consortium. The majority of the participants mentioned that they are willing to form a consortium. Some of the participants mentioned some conditions under which they would or would not like to participate in a consortium. Please refer to *Annex 1, Graphic 5*. Please refer to the table below for the conditions mentioned by the participants.

Conditions
Considering various models of participation
Depending on the partner(s)/ suitable partners
Depending on the project size
If appropriate for the tender structure
Depending on the risks and how they can be mitigated
If the road authorities have a preference to use existing suppliers
The risk of mixing up the requirements between contractor and product performance should be avoided
No need to form a consortium, ability to bid independently

3.2. Theme: Solutions

The solutions proposed in the questionnaire have been discussed extensively during the face-to-face presentations. Due to the confidentiality of the presentations this theme is not discussed in this feedback report.

3.3 Theme: Innovation

- *Q1 Required innovation*

The participants were asked what kind of innovation is needed to further lower the total cost of ownership based on their solution. About fifty percent of the participants claimed that no innovation is needed to further lower the total cost of ownership at the moment. Most of the participants who claimed that no innovation is needed mentioned that there is no innovation needed at the moment but that LED-lighting needs continuous innovation during the roll-out.

- *Q2 Time frame of the innovation*

The participants were asked what time frame is needed for the solution to be market ready (incase innovation is needed for the solution). Please refer to *Annex 1, Graphic 6*.

- Q3 *Influence of the solution on the total cost of ownership*

The participants were asked, in case innovation is needed for their solution, what would the influence of the innovation be on the total cost of ownership. The influences of the solutions on the total cost of ownership proposed in the questionnaire have been discussed extensively during the face-to-face presentations. Due to the confidentiality of the presentations this theme is not discussed in this feedback report.

3.4 Theme: Financing/Contracting

- *Q1 Private financing*

The participants were asked if they would consider private financing. Please refer to *Annex 1, Graphic 7*.

- *Q2 Private financing solution*

The participants were asked which (private) financing solution they consider for the project. The majority of the participants answered that the financing solution depends on authorities' wishes and project characteristics and therefore one third of the participants filled in that the financing solution is not resolved yet. Please refer to the table below for an overview of the solutions.

Solutions
Several company specific solutions were mentioned
PPP (DBMF)
Operational leasing
Service contract
Lease construction
Hire purchase
Managed service
Construction loans
Light as a Service (LaaS)
Direct financing
Customer fitted financing solutions
Considering various financing solutions
Funding will be based on jointly defined sustainability objectives (energy efficiency and CO_2-emissions)
Depends on the country specific tax benefits, energy efficiency incentives and regulatory requirements

- *Q3 Influence of the financing solution on the total cost of ownership*

The participants were asked what the influence of the proposed financing solution is on the total cost of ownership. About fifty percent of the participants mentioned that they could not answer this question yet. The other participants mentioned the following solutions.

Solutions
The investment can better be spread over the contract term
Installations can be renewed faster
Energy consumption can be reduced
An upfront capital loan provides the authorities with the cash flow required to finance the project and re-pay the money only when the savings have been realized
Depends if the project costs can be financed from the reduction of the energy and CO_2-emissions
Possible extension of the payback time
The total cost of ownership during the contract term will be guaranteed
Depends on the kind of guarantees the end user can offer and the extension of the contract
Predicted zero net cost in the first year where possible. The cost of the finance, maintenance, warranties etc. in the first year would be equal to or less than the predicted savings over that period. If the requirement is met the future years would become cash positive
Depends on the tax and incentives in each country
Direct reduction of OPEX
Depends on the duration of the financing period, credit rating of the involved debtors and the project content and size
Shift from CAPEX to OPEX cost, more calculable costs in OPEX
Less budget problems

- *Q4 Contracting method*

The participants were asked how the project can best be contracted with regard to the tender procedure and contract form. Although one third of the participants mentioned that they could not answer this question yet, several methods and suggestions were mentioned. Please refer to the table below.

Methods and suggestions
An open and interoperable solution should be specified
Considering various contracting options
To award the supply and installation to a preferred contractor and then to purchase the luminaires separately from the preferred supplier
DBFM-contract
Separating the procurement for the control systems and the lighting fixtures
Separate tenders for the contractor, installation and maintenance
Start with a RFI (request for information) followed by selecting a short list. After that, start with a RFQ (request for quotation) by a price to quality procedure.
Local tender in each country
Tender for luminaires supply, bases on lowest Luminaire Cost + Energy Cost, should have a duration of minimum 15 years
Best financial solution based on a business plan
Light as a Service (LAAS)
Split the procurement into separate requirements (or lots) such that the best supplier of each project element can be awarded separately
In the tender phase, use the dialogue construction
Performance contract
The project needs to be centrally controlled by one company

3.5 Theme: Other

- *Q1 Risks and obstacles*

The participants were asked what the risks and/or obstacles are for the project. The majority of the participants mentioned several risks and obstacles for the project. Please refer to the table below.

	Risks and obstacles
1.	When the road authorities decides to pick a non-open solution
2.	Scheduling of the deliveries (depends on the requested supply levels)
3.	Communication issues with 3 road authorities being involved (will all 3 road authorities work in the same manner or as individual authorities?)
4.	The contractor needs enough freedom to provide the right solution
5.	Ensuring connectivity for all lighting points across diverse terrain and urban density
6.	Ensuring ongoing upgradability to resolve any security vulnerabilities which emerge quickly across all points
7.	Legal aspects with 3 road authorities being involved
8.	A focus on the luminaire price rather than the light quality and life time of the luminaires
9.	Know how to assess/score the value of the offered solution
10.	Falls statements
11.	Data provided by manufacturers mainly in terms of glare/performance color etc.
12.	Compatibility of specific manufacturers to potential future upgrades or compatibility with other systems
13.	Need to obtain accurate information and details and frequent exchange of information in order to gain details to deliver the best performing project and keep costs at a minimum
14.	If the technical requirements do not include test reports coming from certified laboratories, sensitive data like the lasting life of luminaires are based on suppliers' declarations and bidders may respond with products not aligned with the quality
15.	Cheap luminaires can show on high efficiency when new, but may lose the performance in a short time. Focus should not be on the price
16.	As with any large project across multiple areas and, in this case, across multiple countries, project management and good communication between all parties is absolutely critical; ensuring smooth delivery and coordination of suppliers
17.	Time frame for partners within a consortium to agree
18.	Different country legislation might result in more complex tendering/purchasing/financing processes
19.	Proper asset data
20.	Differences in regulatory requirements between participating countries
21.	Differences in installations and the way of working
22.	Responsibilities between contractor, manufacturer and client
23.	If the focus is only on costs, road safety and environmental aspects will be neglected
24.	Tender phase

- *Q2 Mitigation of the risks and obstacles*

The participants were asked how the risks and obstacles mentioned in Q1 can be mitigated. Several mitigating measure were mentioned. Please refer to the table below.

Risk	Measure
1.	A mature, open, interoperable solution based on published international norms
2/3	To engage at the initial design stages with the designers and clients to establish a greater understanding of what is required by the product and its supplier.
4.	The client need to have sufficient amount of time to work on a proposal
5.	The road authorities should ask providers to provide a network design for all the potential lighting points which may eventually be connected, and request evidence that the solutions have demonstrated the ability to support similar deployments with diverse topology
6.	The road authorities should ask providers to provide evidence that their system can be upgraded over the air in a timely manner
7.	By using a PAN European contract/SLA for all financial and legal issues. Specify and describe country issues in subcontracts as part of the main contract/SLA
8.	Making sure that the quality criteria for the luminaires are right for the needs and separate the tender in two, so quality and price are evaluated separately
9.	Spend time on education and figure out which systems really offers an autonomy and

	independence
13.	Close exchange of information and on-site visits
14/15	State in the tender requirements that all the documents submitted by the suppliers must be supported by a certified laboratory
16.	Seek input from suppliers in the industry to support specification writing early in the process. Appoint a technical team to review the requirements of each road authority to ensure conformance. Appoint a project delivery team and host regular meetings with all parties before and during the project
18/19	Provide adequate preparation time, involve legal & technical consultants, prepare a detailed registry of the existing infrastructure (if not already available). Keep the tender as close as possible to local and EU minimum requirements with less weight on local-only requirements
20/21/22/	Each country should make its own tender and it should be treated as a separate project. Requirements in the tender should be feasible, with clear demarcation
23.	Redefine the scope of the project to "Road of the future, the perfect balance between road safety, environmental preservation and cost over lifetime." Award these criteria on an equal basis
24.	Sole and unique contract for LED Dimmable Lighting, not a part of a civil contract

4. Next steps

After this market consultation, the Dimmable LED Lighting Team will discuss and determine the joint procurement strategy and the key technical aspects of the lighting requirements. This strategy will contain the conclusions of the input mentioned above and possible approaches, such as:

I. another market consultation, including a possible sight visit organized by the road authorities;

II. additional short questions to discuss less complex issues;

III. a set of company meetings with selected suppliers for more complex issues;

IV start of the procurement.