



Ministerie van Infrastructuur
en Waterstaat

Market consultation report

Project:
Caeli Laser

Market consultation report	
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Contracting Authority	State of the Netherlands, Ministry of Infrastructure and Water Management
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Ministry of Infrastructure and Water Management

Royal Netherlands Metrological Institute

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1 THE MARKET CONSULTATION REPORT

This report summarizes the outcomes of the market consultation conducted in preparation for the upcoming tender concerning the procurement of a laser system for the Cabauw Atmospheric Research Station. The consultation focused on replacing the current laser in the atmospheric Raman lidar system 'Caeli' with a new unit, and associated maintenance services.

The Caeli lidar system plays a critical role in the continuous and simultaneous measurement of water vapor, clouds, aerosols, and temperature. The existing laser (Continuum Powerlite 9030) has reached the end of its operational life, prompting the need for a replacement. The procurement concerns a single laser unit with a contract duration of ten years.

Additionally, the Contracting Authority seeks to engage a qualified laser engineer to provide on-site maintenance services for the Caeli laser at the Cabauw Atmospheric Research Station.

This market consultation was conducted electronically via TenderNed and served to assess the availability, technical capabilities, and interest of potential suppliers. The insights gathered have informed the Contracting Authority's procurement strategy and ensured alignment with market possibilities.

1.1 Contracting Authority and Client

The Contracting Authority is the State of the Netherlands, Ministry of Infrastructure and Water Management. The Tender will be carried out on behalf of Royal Netherlands Metrological Institute (KNMI).

1.2 The tender

1.2.1 Context of the tender

The Cabauw Atmospheric Research Station requires the procurement of a laser to replace the current laser in the atmospheric Raman lidar system 'Caeli' with an external cooling system, along with the associated maintenance services.

The Caeli laser is part of a Lidar system used for the continuous and simultaneous measurement of water vapor, clouds, and aerosols, as well as temperature.

The current laser (Continuum Powerlite 9030) is now due to replacement. This concerns the acquisition of one laser, with a contract duration of 10 years. The Caeli laser requires an external cooling system to maintain the correct operating temperature. In consultation with the Ministry of Infrastructure and Water Management (IenW) and the project leader, it has been decided to tender the cooling system separately.

In addition to the laser, there is a need for a laser engineer who will provide on-site maintenance of the Caeli laser at the Cabauw Atmospheric Research Station located at **Zijdweg 1, 3411 MH Lopik, the Netherlands**.

1.3 Desired situation after award: outline of the future situation

Following the award of the contract, the Caeli laser system, including its external cooling unit, will be successfully installed and fully operational at the 'Cabauw' station. The laser will be integrated into the existing Lidar system to enable continuous and simultaneous measurement of water vapor, clouds, and aerosols and temperature. A qualified laser engineer will be available to provide regular on-site maintenance, ensuring optimal performance and longevity of the system throughout the 10-year contract period.

2 MARKET CONSULTATION AND PROCEDURAL PROVISIONS

2.1 Purpose of the Market Consultation

Based on discussions with the KNMI project leader, it has become clear that there is insufficient clarity regarding which potential suppliers can meet the specified requirements for the laser. For this reason, a market consultation has been conducted to investigate whether one or more suitable potential suppliers can meet KNMI's needs. The results of the market consultation will determine whether a European public procurement procedure is feasible, or technical dependency prevents effective competition.

2.2 Procedure of the market consultation

The market consultation was published on TenderNed on September 9th 2025, allowing all potential suppliers the opportunity to respond. All interested parties had the possibility to submit questions until September 26th 2025. The responses are documented in this report.

2.3 Questions submitted by the potential suppliers

The potential suppliers were allowed to submit questions via TenderNed. The questions were answered by the KNMI project team and are published on TenderNed. The questions and answers are listed below.

Question and answer 1:

Q: Can we have information on the estimated use rate of the laser in terms of number of hours, days, weeks, year?

A: Current use is 2x week for 4-6 hours (about 300 hours yearly) plus campaigns (24/7 for up to two weeks - up to 300 hours yearly). In case of successful automation the use will increase to weather limited conditions (50% - about 4000 hours yearly).

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Question and answer 2:

Q: Does the tender allow variants?

A: Variants as defined in the Public Procurement Act 2012 are not permitted during the upcoming procurement procedure. However, it is possible to describe your model variants in your response to our questions during the market consultation, so that we can address them in our feedback on the consultation. For each manufacturer and model, the configuration needs to be optimized, which means a selection of options, which can also be included in your answers to the consultation.

Question and answer 3:

Q: For the wavelength separation, do you have a more precise scheme?

A: The separation scheme is included in the document published on TenderNed, at this time there isn't a more precise scheme which can be shared as this consultation is used to determine which options (potential supplier and laser wise) are available in the current market.

2.4 Answers provided by the potential suppliers

The Contracting Authority formulated questions to assess the availability and feasibility of the product under consideration. The questions are designed to gather insights from potential suppliers regarding their capabilities, technical solutions, and service offerings. The responses help determine whether the market can meet the identified needs and will inform the next steps in the procurement process.

Three potential suppliers submitted their response to the market consultation. The answers to the questions are anonymized and summarized into a generic answer.

2.4.1 Sustainability & Social Return

For the sustainability and social return questions, two out of three potential suppliers responded.

Question and answer 1:

Q: Does your organization hold any certifications or accreditations related to environmental sustainability, corporate social responsibility, or sustainable procurement? If so, please specify.

A: One potential supplier holds certifications that helps them control their environmental aspects, reduce impact and ensure legal compliance, and demonstrates commitment to sustainability. Another potential supplier has implemented a Corporate Social Responsibility policy into its overall strategy. The standard products of this potential supplier also bear the CE marking.

Question and answer 2:

Q: How does your organization incorporate sustainability principles into the delivery of similar products or services (e.g., energy efficiency, circularity, low-emission logistics, sustainable materials)? Can you provide examples of how your organization applies social return practices in its operations (e.g., inclusive hiring, training programs for disadvantaged groups, local community engagement)?

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A: One potential supplier provided input, mentioning that sustainability is integrated at different levels.

Question and answer 3:

Q: What opportunities do you see for integrating sustainability and/or social return requirements into a future tender for this product? Are there specific measures or KPIs you would recommend?

A: Recommendation to integrate different requirements in the tender. The criteria are based on eco-design and energy efficiency of products, use of sustainable or recycled materials, indicators for reducing CO2 emissions, social KPIs, requirements for certifications and monitoring supplier compliance, with an ethical and environmental code of conduct.

Question and answer 4:

Q: Are there any limitations or risks we should be aware of when including sustainability and social return criteria in the procurement of this product?

A: Measurement and monitoring is seen as a potential recommendation or risk. Defining and measuring the social or environmental KPIs can be complex and may require suitable tools.

2.4.2 General questions (requirements & price)

Question and answer 1:

Q: Can you supply a laser which complies within the set requirements; (if so, please provide a description/technical documents)

A: The answers are given per requirement.

Requirement	Answer
The laser shall be suitable for Atmospheric Raman lidar applications for water vapor, temperature, clouds, and aerosols profiling.	The lasers are suitable for Atmospheric Raman lidar applications for water vapor, temperature, clouds, and aerosols profiling.
The instruments shall be capable of 24/7 unattended operation for extended periods of time with an uptime exceeding 90%.	The instruments are capable of 24/7 unattended operation for extended periods of time with an uptime exceeding 90%.
The instrument lifetime shall be at least 10 years. Parts and consumables shall be available during 10 years after commissioning.	The instrument lifetimes are greater than 10 years.
The instrument shall be "low maintenance" i.e. the required frequency of replacement of components or consumables.	The instrument shall be "low maintenance".
The laser shall fit inside the existing Caeli lidar system without major redesign of the lidar emitter layout and configuration.	The lasers fit inside the existing Caeli lidar system without major redesign of the lidar emitter layout and configuration.

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The laser type shall be Nd:YAG, emitting 1064 nm, 532 nm and 355 nm simultaneously.	The lasers of the potential suppliers meet the requirement.
The 1064 nm, 532 nm and 355 nm laser beams shall be emitted spatially separated (non-overlapping parallel beams).	The lasers fit the requirement. The 1064 nm, 523 nm and 255 nm can be emitted simultaneously spatially separated.
The delivered energy per pulse at 355 nm shall be greater than 330 mJ when simultaneously emitting 1064 nm and 532 nm, and the pulse repetition rate shall be equal or greater than 30Hz, preferably 100 Hz. Note that the 330 mJ level shall be the sustainable level of the energy per pulse. The average power emitted at 355 nm shall therefore be 10W or better.	Energy delivered per pulse fits the requirements. In some cases energy requirements can be met at the higher repetition rate of 100Hz, up to to 200 Hz.
The emitted light shall be linearly polarized with polarization ratio > 90%.	The lasers fit the requirement.
The beam divergence shall be < 0.5 mrad.	The lasers fit the requirement and in some cases the the laser divergence is <0.7mrad.
Beam profile: Near field shall not have "hotspots" to avoid damage to the transmitting optics.	Measurement beam profile: <ul style="list-style-type: none">• every 50 from 0 to 3m.• smooth spatial beam profiles at 100Hz and 30Hz.
Soft start/ramp-up power to avoid damage to optical components inside the laser and throughout the emitter chain.	The lasers fit the requirement.
Injection seeded wavelength stabilisation	The lasers fit the requirement.
The laser head (i.e. laser excluding the power supply) shall be smaller than, or similar to 150 cm (length) by 65 cm (width) by 65 cm (height).	The laser heads are smaller than 150 cm (length) by 65 cm (width) by 65 cm (height).
The laser head shall be detachable from the power supply and cooling system (cable and hose connectors). The connecting cables and hoses shall be at least 4m. Applicable connectors shall be in accessible places close to the laser head and close to the power supply.	The lasers fit the requirement.

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Built-in pulse energy and pulse profile monitoring system.	The lasers fit the requirement.
Power supply size: should be equal or smaller than the current cabinet (i.e. less than 92 cm high).	The lasers fit the requirement.
Shall be capable of connecting to a water to a third party water to air chiller system.	The lasers are capable of connecting to a water to a third party water to air chiller system.
Control software must allow for remote and unattended continuous operation. the laser should also be controllable from an external, third-party software (python or LabVIEW).	The lasers fit the requirement.
An appropriate interlock loop system shall be in place for inclusion of kill switches and auxilliary interlocks.	The lasers fit the requirement.
Maintenance plan and/or requirements to keep pulse energy > 80% of nominal value during the minimum lifetime of the equipment (10 years).	The lasers fit the requirement.
Regular preventive maintenance service visits shall be offered.	Maintenance is possible, by: <ul style="list-style-type: none">• delivering spare parts and bug fixes;• dedicated price can be considered for preventive maintenance.
During the entire period of support of the instrument, the Tenderer shall supply spare parts and bug fixes so that adequate maintenance can be carried out by trained personnel.	Spare parts and bug fixes are confirmed by people that are authorized to do the corrective maintenance.
Service engineers should be able to reach the laser in an acceptable amount of travel time (approximately one day).	All available service engineers are relatively close by.
Response time to make an appointment in case of down time should be within three days.	Response time within three days is possible.
The system shall be up and running within a month in case of downtime.	It is possible but, in some cases it is needed to book some stock for the customer.

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In case an intensive observation period is planned, a stricter requirement of one week shall be applied	It is possible but, in some cases it's needed to book some stock for the customer.
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Question and answer 2:

Q: Can you supply a laser which complies within the set requirements and some additional options; (if so, please provide a description/technical documents).

A: The lasers of the potential suppliers meet the requirements. The additional options consist of: 1) a calorimeter to measure energy, 2) a photodiode to measure the temporal profile of the pulse, 3) a beam separation module for the three beams 4) auto-tuning/auto-tracking.

Question and answer 3:

Q: Can you supply an estimated cost of the laser with the maintenance included which complies with the requirements set in the consultation document.

A: The project team has a certain budget in mind. Not all of the lasers from the potential suppliers are within this budget.

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3 GENERAL INFORMATION

3.1 Contact person

All communication during this selection phase will take place via TenderNed. The contact person for this procurement is also listed in TenderNed. Only in the event of a malfunction in TenderNed may contact be made with the contact person through other means.

Name: Mr. T (Tim) van der Zande

E-mailadres: tvanderzande@sbmc.nl

In the absence of Mr. van der Zande, you may contact the following person:

Name: Ms. A. (Anouk) Suijkerbuijk

E-mailadres: suijkerbuijk.anouk@kpmg.nl

3.2 Procedure following the consultation

The input provided by potential suppliers during the market consultation has been carefully collected and reviewed. The input received from potential suppliers during this market consultation serves as the basis for determining whether a public procurement procedure is feasible. If it is deemed possible to proceed with a public tender, the involved parties will be notified once the publication date is confirmed.