



Market consultation document

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Departement : Ministry of Infrastructure and Water Management
Entity : Royal Netherlands Meteorological Institute
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1 Introduction

1.1 Introduction

In preparation for the European tender 'Temperature sensors', with TenderNed reference TN 588023, a market consultation is being conducted.

This document contains a description of the background and scope, the procedure, and a number of questions formulated by the Contracting Authority in order to publish the best possible tender on the market based on the answers to this consultation.

Partly based on the outcomes of this market consultation, the Contracting Authority will determine how the need for temperature sensors will be tendered and contracted.

The results of the market consultation may be incorporated into any tender documents, without being traceable to the participants of the market consultation. The information provided by you will be treated confidentially. It is expressly not intended that the respondents submit a detailed offer at this stage.

Contracting authority

This market consultation is conducted by the Ministry of Infrastructure and Water Management, Royal Netherlands Meteorological Institute (hereinafter KNMI).

Ministry of Infrastructure and Water Management

The Ministry of Infrastructure and Water Management is committed to improving quality of life, access and mobility in a clean, safe and sustainable environment. The Ministry strives to create an efficient network of roads, railways, waterways and airways, effective water management to protect against flooding, and improved air and water quality.

Royal Netherlands Meteorological Institute

The Royal Netherlands Meteorological Institute located in De Bilt (near Utrecht) in the Netherlands, is the national research and information center for meteorology, climate and seismology. KNMI contributes 24/7 to a safe and livable Netherlands by providing society with independent knowledge, advice and warnings about risks in the field of weather, climate and seismology.

The climate is changing, the weather is becoming more erratic, the ground is shaking. Keeping the Netherlands safe and livable is becoming an increasingly challenging task. KNMI therefore wants to gain more insight into the impact of weather, climate, seismology and other geophysical phenomena on society, in both the short and long term. In cooperation with our societal partners and from a solid position in a strong international network, we generate and combine the best observations, scientific analyses and top-grade technology to provide the Netherlands with timely information, advice and warnings.

1.2 Reading guide

Chapter 2 presents the background, subject of matter (scope), and purpose of the market consultation. Chapter 3 addresses the procedural aspects surrounding this market consultation, and Chapter 4 contains the questions on which the Contracting Authority wishes to receive input.



2 Subject

2.1 Introduction

Based on this document, suppliers can respond to the questions raised in this market consultation.

2.2 Cause

It is of essential importance for the KNMI to purchase reliable, future-proof sensors and to modernize the sensor network.

2.3 Scope

KNMI intends to start a tender with the objective of contracting a partner to supply temperature sensors. As part of the purchase of new sensors, an extensive validation process is required. This process is intended to carefully substantiate any differences within the measurement network compared to the current situation towards users.

The validation process must cover all seasonal and location influences and therefore has a duration of at least one (1) year.

The intended duration of the supply and maintenance contract is ten (10) years, with the possibility of multiple extensions (up to more than fifteen (15) years).

In addition to the procurement of sensors, the Contracting Authority requires 3rd line maintenance services for these sensors. 3rd line maintenance refers to addressing all sensor issues that cannot be resolved by KNMI's internal service organization. This included, for example, repairs of significant damage, and recalibration of sensors that can no longer be calibrated using the standard procedures as outlined in the manual.

KNMI manages 1st and 2nd line maintenance in-house and strives to perform as much of the sensor repair and recalibration work as possible to maintain extensive experience and knowledge of the sensors.

The 3rd line maintenance services, to be conducted by the supplier, include:

- Failure analysis, including a detailed report on the failure;
- Repair or replacement of sensors, including a detailed report on the failure and the solution implemented;
- Delivery or replacement of sensor modules/components, as part of preventive maintenance;
- Configuration of sensor software, settings and hardware, to meet KNMI requirements;
- Conducting a renewed Factory Acceptance Test, with the test report included in the delivery;
- Renewed Factory calibration of the instrument, with a calibration report included in the delivery;
- Release of software/firmware updates, with a detailed specification of changes and recommendation regarding the applicability of the update to KNMI.

Out of Scope

The installation of the temperature sensors and their preventive and corrective maintenance (1st and 2nd line maintenance) fall outside the scope of this contract. KNMI will perform 1st and 2nd line maintenance internally at a predetermined cost as detailed below.



1st line maintenance (conducted at the observation site) is performed on a regular basis or sooner in case of a warning or failure. This includes:

- Inspection of the sensor, cables and connectors for any signs of wear or damage;
- Inspection of the surrounding environment for factors that may affect the sensor performance;
- Periodic cleaning of the sensor (third-party cleaning services may be used with appropriate tools and instructions);
- Retrieving sensor data and status to verify correct operation;
- Replacing the sensor as part of routine 2nd line maintenance or in response to failure.

2nd line maintenance (conducted at KNMI) follows the maintenance plan at the end of the calibration period or sooner if there is a warning or failure. The maintenance interval of 2nd line maintenance varies by sensor, currently ranging from 12 to 36 months. This includes:

- Analysis of failure to determine whether 3rd line maintenance is required;
- Thorough cleaning of the entire sensor;
- Inspecting the mechanical components, such as connections, fuses);
- Performing preventive plug-and-play part replacements;
- Uploading new software versions released by the supplier Tenderer);
- Adjusting sensor software, settings, and configuration to align with KNMI standards;
- Verifying and adjusting the sensor calibration;
- Executing the Verification Protocol.

Problem definition/main objective:

For the KNMI, investing in a state-of-the-art sensor network is of primary importance. Without the best and reliable equipment and associated services, it is impossible for the KNMI to carry out its most important core task, which is ensuring the continuity and reliability of meteorological observations for a safe and livable Netherlands.

Sub-objectives:

We believe it is important that our partners of our sensor network continuously improves and innovates. Innovative strength is a fundamental attitude of our suppliers/partners. Creative, yet critical, moving into the future with us in a professional manner.

Caring for the KNMI as a client/partner and unburdening us of supporting processes (equipment maintenance/speed of partial deliveries/communication) are principles that lead to a healthy and sustainable collaborative relationship.

The KNMI understands that there are sensor available across national borders that meet the KNMI's needs. Therefore, the KNMI is willing to engage in co-makship on the global stage.

Illustration of the current application of the temperature sensor at the KNMI

The KNMI's temperature measurements are part of an extensive observation network of automated weather stations. A measurement is taken every few seconds and sent to the KNMI. These measurements are stored and used within the KNMI for internal use, for example in the weather room, as input for weather models, and for climate research. In addition, the measurements are also shared with various users.

More information about current applications is publicly available at:

<https://www.knmi.nl/kennis-en-datacentrum/uitleg/automatische-weerstations>

<https://www.knmi.nl/over-het-knmi/nieuws/homogenisatie-zorgt-voor-betrouwbare-temperatuurreeksen>

https://cdn.knmi.nl/system/readmore_links/files/000/001/212/original/Meteorologica_Maart_2019.pdf



2.4 Objectives market consultation

This market consultation is being conducted in preparation for the European tender 'Temperature sensors'.

Through this, the Contracting Authority aims to gain a clear picture of current (market) developments, the available expertise, how these can be translated into the needs of the KNMI, as well as the (im)possibilities of the market.

Furthermore, with this market consultation, KNMI aims to:

- to gain insight into the realistic feasibility of the project and the preconditions under which the project can be executed;
- to gather input for the procurement strategy and the tender documents (generating new ideas, testing existing ideas);
- to involve the market in the project at an early stage in order to align the tender documents as closely as possible with the market situation and market demands;
- to gain insight into whether the stated need will lead to an optimal solution for one's own organization;
- to gain insight into the extent to which functional or technical specifications are required and which standards may be relevant.

The Contracting Authority uses the knowledge and insights gained from this market consultation to determine the procurement strategy. A strategy that does justice to both the opportunities of the market and the needs of the KNMI.

Chapter 4 sets out the questions that the KNMI wishes to have answered through the market consultation.

2.5 Proposed procedure

Given the nature of the scope and the validation process, the Contracting Authority sees the following possible tender procedural choices:

- the competitive procedure with negotiation, or;
- the competitive dialogue.

In this regard, the Contracting Authority sees the following phasing of the procurement process:

- Phase 1: market consultation;
- Phase 2: tender:
 - A.** Selection based on capability;
 - B.** Dialogue based on the problem definition/main objective;
 - C.** Bidding phase with a concrete offer based on the KNMI's needs;
 - Quality assessment;
 - Negotiation;
 - Invitation to deliver sensors and provide support when needed.
 - D.** Pre-validation with the three most capable and highest quality bidders and continue validation with the best sensor. Here, the KNMI wants to conduct a step-by-step (pre-)validation: Here, the KNMI wants to conduct a step-by-step validation:
 1. Lab tests with a maximum of three (3) potential bidders;
 2. Subsequently a go/no go decision for a pre-validation;
 3. Pre-validation with the chosen bidders/sensors on the KNMI testfield and possibly one (1) other location.
 4. Select the best sensor after pre-validation.
 5. Continu validation with the sensor of the awarded bidder of the remainder of the year, with expansion to multiple locations.
- Phase 3: Award of the assignment and contracting of delivery of the validated temperature sensors and 3rd line maintenance services.



3 Market consultation procedure

3.1 Planning

De planning for the market consultation is as follows:

Activity	Date
Publication of market consultation via TenderNed	Monday, May 3 2026
Deadline for submitting questions in regard to this document	Tuesday, May 12 2026
Submission of answers by Contracting Authority	Thursday, May 21 2026
Digitally upload answered questionnaire via TenderNed (no later than 01:00 PM)	Thursday, May 28 2026

3.2 Submission of answers

The Contracting Authority would greatly appreciate it if interested parties would answer the questions posed. Your contribution must be received via TenderNed no later than **Thursday, May 28, 2026, 01:00 PM**. You are requested to use the 'Questionnaire Answer Form'.

If no input has been received by the aforementioned date, it will be assumed that you do not wish to provide any input. Answering (only) a few questions is also appreciated. The Contracting Authority reserves the right to include input received too late. Acquisition in response to this market consultation is not appreciated.

3.3 Further explanation

Should the Contracting Authority wish to receive clarification regarding the answers provided, we reserve the option to invite some or all parties for an in-depth discussion. The initiative for this rests solely with the Contracting Authority.

3.4 Communication during the market consultation

During the market consultation, all communication, with the exception of in-depth discussions on this subject and/or the market consultation itself, will take place via TenderNed. The contact person on behalf of the Ministry of Infrastructure and Water Management is Dave van der Kroft. A summary of the market consultation will be published by the Contracting Authority on TenderNed.

3.5 Conditions

- Participation in the market consultation is voluntary for interested parties and the Contracting Authority;
- No rights or obligations towards (the State of the Netherlands) can be derived from this market consultation and the documents made available;
- This market consultation is expressly not intended to make a pre-selection in the context of a potential tender. Nor will parties involved in the market consultation be excluded in any way from a potential tender;
- By participating in the market consultation, interested parties will not be placed in a favored or disadvantaged position at the time of a potential tender;
- No costs may be charged for submitting the responses and for the work to be performed and materials to be provided in connection therewith;
- Claims regarding the use of information, confidentiality, or requests for compensation in connection with this market consultation will not be honored;
- The Contracting Authority reserves all rights regarding the determination of the potential procurement procedure;
- The Contracting Authority is free to terminate the market consultation – for any



- reason whatsoever;
- By participating in the market consultation, the parties indicate their unconditional agreement to all provisions of this market consultation.

3.6 Confidentiality

The results of the market consultation may be incorporated into tender documents without being traceable to the participants of the market consultation. The information you provide will be treated confidentially.



4 Questionnaire market consultation

To answer the questions, please use Appendix 1 'Questionnaire Answer Form'.

Question 1. Company details

To get an idea of the participants in this market consultation, you are requested to provide information about your company and the contact person for this market consultation in Appendix 1 under Question 1.

Question 2. (Market) developments

We are interested in relevant developments in the field of temperature sensors.

For our current temperature measurements, we use a PT500 sensor element in a 4-wire version. We connect this sensor to our hardware and software application to determine the air temperature.

At land locations, we measure this temperature at both 1,5 meter and 10 centimeter heights (grass temperature). These measurements are placed in so-called radiation shields to limit interference with the measurement. Other locations include offshore platforms and the BES islands.

The sensor properties that are most important to the KNMI are high stability, low uncertainty, high reproducibility, and as linear as possible over the full measurement range.

Question 2a: Taking our application into account, which developments, both market and innovative, are relevant to this assignment in your view?

Question 2b: And in your opinion, how can the Contracting Authority take this into account in a new tender?

Question 2c: In what form would you propose a sensor for the KNMI's questioned objective? Consider the following:

- The sensor technology used;
- Whether processing takes place within the sensor itself or outside of it;
- Commercially available or custom-made;
- Etc.

Question 2d: The KNMI prefers to retain the current setups. What is your view on this?

Question 3. Interest in the assignment

What might be your reasons for participating or not participating in the tendering procedure?

Question 4. Legislation and regulations

Stakeholders require our monitoring network to be compliant with WMO and ICAO guidelines. Do these guidelines constitute an obstacle to participating in this tender procedure?

Question 5. Procedure

The Contracting Authority has described a direction for procurement procedures in paragraph 2.5. In your opinion, which procedure suits best with the needs of the Contracting Authority and the market? Or perhaps, do you have other ideas?

Question 6. (Price)model

Question 6a: Which (pricing) model enables you to make market-compliant offers throughout the entire duration of the agreement? And can you substantiate this and indicate what you expect or need from the Contracting Authority to achieve the above?



Question 6b: For the verification phase, the Contracting Authority intends to have one or more market products placed for the purpose of the assessment. In your opinion, what does a fair tender cost for placing your product look like?

Question 6c: How can the KNMI maintain sufficient flexibility in the contract given the long duration of the agreement?

Question 7. Quality

Suppliers must be able to distinguish themselves based on the quality they deliver.

Which Question could we ask in the tender to highlight distinctive quality aspects? What would you like to be challenged on?

Consider the following:

What is the longest possible period for the sensors to remain stable?

The KNMI periodically calibrates each sensor to monitor deviations due to age degradation. What would you propose as the longest possible calibration period (time between calibrations)?

Question 8. subcontracting/collaboration

The contracting authority also requires access to specific specialist expertise in the field of temperature sensors.

Is main contracting and subcontracting an appropriate form of collaboration in this industry?

Question 9. Delivery time

Within what timeframe can you deliver your market product?

Question 10. Corporate social responsibility

What opportunities do you see in the field of Corporate Social Responsibility in relation to this assignment?

Question 11. Other

In your view, are there other aspects or matters that the Contracting Authority should pay attention to in the proposed tender?