Procurement Guide

for the European public Procurement Procedure for the design, delivery and deployment of 4 borehole monitoring strings

Contracting Authority:
The Netherlands Organisation for Applied Scientific Research (TNO)

Guide number	**:**	**WS2429850681**
Date	**:**	**10 march 2025**

Contents

Definitions

In this Procurement Guide, words written with an initial capital, both singular and plural, shall have the following meanings. Terms not mentioned in this list but defined in the Dutch Public Procurement Act [*Aanbestedingswet*] have the meaning assigned to them in the Procurement Act.

Contracting Authority	: TNO, Netherlands Organisation for applied scientific research
Procurement Guide	: the present document describing the Procurement Procedure.
Procurement Procedure	: the present European public Procurement Procedure by which the conclusion of the Contract is tendered.
Dutch Public Procurement Act	: Dutch Public Procurement Act 2012 (hereinafter: "Procurement Act" or "Aw") concerning the implementation of procurement directives 2014/23/EU, 2014/24/EU and 2014/25/EU
Procurement Documents	: all documents prepared by or on behalf of TNO for the purpose of the Procurement Procedure.
Announcement	: the Notice of Procurement Procedure at www.TenderNed.nl.
Annex(es)	: The Annexes to the Procurement Guide, namely: • **A01** to A.[...] - i.e. the formats to be used by the Tenderer in preparing and submitting its Tender, • **B01** to B.[...] - i.e. the formats to be used by the intended beneficiary for the purpose of submitting supporting documents relating to the ESPD at the request of TNO, • **C01** to C.[...] - i.e. documents and (additional) information, which form part of the Procurement Guide and are not intended for submission by the Tenderer or the intended beneficiary.
Combination	: an alliance of enterprises tendering jointly as a single Tenderer, each of the Combination members being jointly and severally liable for the performance of the Contract.
Third Party	: natural persons on whom, or legal entities on which, a Tenderer may rely in order to meet the Suitability Requirements of financial and economic standing and/or technical and professional competence, irrespective of the legal nature of its links with said Third Party.
Suitability Requirements	: the requirements imposed by TNO on Tenderers not excluded on the basis of the Grounds for Exclusion, which Tenderers must meet as a minimum in order to be eligible for the award of the Contract, on penalty of invalidation, as described in Section 5.
Award criterion	: the criterion used by TNO in the assessment and ranking of Tenders for the purpose of awarding the Contract, as referred to in Section 6.
Award decision	: the written communication of TNO's choice of the Tenderer with which it intends to conclude the Contract or its choice not to conclude a Contract.
Tenderer	: an entrepreneur submitting a Tender.
Tender	: an offer/quotation made by a Tenderer.
Minimum Requirements	: the requirements set by TNO regarding the manner in which the Contractor must perform the Contract.
Information Notice	: the document containing further information about the Procurement Procedure and/or the Procurement Documents and in which TNO presents and answers the Tenderers' questions in anonymised form.
Contractor	: the Tenderer with which the Contract is concluded.
Contract	: the Contract concluded with the Contractor pursuant to the outcome of the Procurement Procedure., e.g. the Purchase Order provided to the Contractor, referring to this Tender procedure and the Tender concerned);
Grounds for Exclusion	: grounds for exclusion from participation in the Procurement Procedure, which – depending on the provisions of the Procurement Documents – relate to circumstances concerning the (person of the) Tenderer, the (person of the) Third Party and/or the (person of the) Subcontractor.
European Single Procurement Document	: the declaration as referred to in Article 2.84(1) of the Procurement Act, which TNO has attached to the Procurement Guide as Annex **A01** (hereinafter: ESPD).

1 Contracting Authority and Contract

1.1 TNO

TNO, Netherlands Organisation for applied scientific research, hereinafter referred to as "TNO", is a modern unit-driven Research & Knowledge organisation, established by law in 1932 to make scientific research applicable to enterprises, government bodies and civil-society organisations and thereby strengthen innovative capacity.
TNO is a public-law legal entity and operates under the ministerial responsibility of the Dutch Minister of Economic Affairs but, as an organisation, performs its tasks independently.

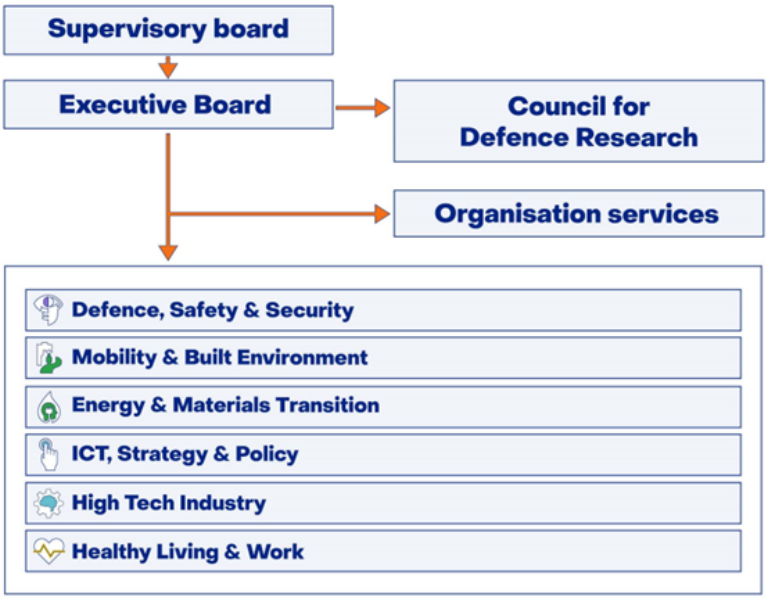
Every day, TNO's employees are working on the development and application of innovative research. TNO provides contract research and specialist consultancy and licenses patents and specialist software. TNO starts up new enterprises to bring innovations to market.

TNO's strength lies in its ability to combine diverse fields of science to create ground-breaking, sustainable solutions. Increasingly, TNO does so by collaborating with government bodies, industry, other knowledge institutions and civil-society organisations, both nationally and internationally. Through its work, TNO stimulates economic growth and social innovation.

TNO's mission is creating impactful innovations for the sustainable wellbeing and prosperity of society. How TNO fulfils this mission is described in its strategic plan for 2022-2025 and focuses on four societal challenges: a safe and secure society, a sustainable society, a healthy society and the digitalisation of society and industry. TNO's goal is to connect, change and accelerate: Innovation for Life. For more information on TNO, see: www.TNO.nl.

1.2 The TNO organisation

With TNO's highly ambitious approach comes an organisational form that effectively facilitates this ambition and a culture that challenges employees to innovate and collaborate. The TNO organisation has a unit structure as shown below:



The six organisational units (Units) are market-oriented and recognisable to TNO's customers and partners. The Units are based across the Netherlands with a total of 21 locations/research facilities. The head office is located in The Hague and accommodates the central staff bodies (Shared Services Organisation) and from where the entire TNO organisation is supported and managed.

Procurement department
The Procurement department is effecting the procurement on behalf of TNO in close cooperation with the Geosciences and Technology (GST) department. Procurement, as part of the Finance, Procurement & Legal (FPL) department, is responsible for organising and executing procurement processes and ensuring that these processes are in line with the TNO objectives.

1.3 Purpose of the Tender

The purpose of the Tender is TNO's intention to enter into a Contract with one (1) Contractor for the design, delivery and deployment of 4 borehole monitoring strings. This supply/service shall be performed in accordance with the requirements and preferences as set out in the Procurement Documents.

1.4 Term of the Contract

TNO aims to have the Contract commence on (short after) 18 June 2025.

1.5 Current situation, vision of future situation

In this document we request a quotation for the design, delivery, deployment, setup, testing, calibration and maintenance of 4 borehole tool strings containing geophones (and optionally, fiber optic cables) and their associated surface installation and equipment, hereafter the 'design, delivery, and deployment' of 4 borehole monitoring strings (hereafter called: tool strings). These tool strings are to be deployed into former geothermal wells at two locations in the Netherlands – the Middenmeer geothermal project and the Bleiswijk geothermal project. These wells have injected or produced geothermal fluids in the past, but have now been abandoned (VDB-GT-01 and VDB-GT-03) or suspended (MDM-GT-03-S2, VDB-GT-04). New wells have been drilled subparallel to those former wells (see Annex C02). The abandoned and suspended wells are now dedicated to monitoring. One of the suspended wells (MDM-GT-03-S2) is available for monitoring above the reservoir at a depth of ~2400 m AH (~2200 m TVD). The second suspended well (VDB-GT-04) is open down to the reservoir level to ~2000 m AH (~1800 m TVD). The other two wells (VDB-GT-01 and VDB-GT-03) have been abandoned at 300 and 700 m depth.

The tool strings are part of monitoring within the TKI Geo4All Innovation Program geothermal, and are meant for research purposes (innovatie.geothermie.nl). The first research objective of the monitoring is to record microseismicity related to the geothermal energy production, which might be expected as a result of reservoir cooling around other geothermal injection wells which have been drilled in the same license area. The intent is to record and be able to localize microseismic events to as high a resolution as possible within the technical and budgetary limits of the project. The second research objective is to record pressure, temperature and velocity changes in the reservoir where possible – i.e. for the VDB-GT-04 well which remains open/available for monitoring down to the reservoir level. The intent is to monitor over prolonged time intervals of >5 year, and preferably semi-permanently, with the strings in the deep wells only being removed for mandatory integrity logging every 5 years.

We request to quote the prices for Base request (Tool string 1A, 2, 3A and 4A) in Annex A03 Format for Price Sheet. In addition TNO is interested in prices for Extension 1, 2, 3, 4 and 5. Extension 1, 2, 3, 4 and 5 are not taken into account in determining the lowest price for sub-award criterion Price TP (see para. 6.1), but TNO wants to retain the option to purchase one or more of these Extensions. Annex A03 Format for Price Sheet therefor also contains also includes lines to price these Extensions.

In the PoR the requirements for the various tool string are listed. First, requirements for the Middenmeer tool string (Tool string 1) are given, and second, requirements for the Bleiswijk shallower boreholes and deep boreholes (Tool strings 2 – 4) are specified. Background information on the objectives, the geothermal sites, and the wells can be found in Annex C02.

Table 1: Overview of requested price scenarios. Pricing for all four tool strings systems must include all associated costs such as costs for cabling, the datalogger, the design, shipping, deployment, testing, surface installation, calibration and maintenance:

Scenario	Short name	Tool string specifics
Base request	Tool string 1A	5-geophone tool string system MDM-GT-03-S2 to 2.4 km depth AH
	Tool string 2	2-geophone tool string system VDB-GT-01 to 300 m depth AH
	Tool string 3A	2-geophone tool string system VDB-GT-03 to 700 m depth AH
	Tool string 4A	2-geophone tool string system VDB-GT-04 to 2.0 km depth AH
Extension 1	Tool string 1B	Tool string 1A + plug + pressure and temperature gauge
Extension 2	Tool string 1C	Tool string 1A + DAS/DTS cable + DAS interrogator
Extension 3	Tool string 3B	Tool string 3A + extra geophone at 200 m depth.
Extension 4	Tool string 4B	Tool string 4A + DAS/DTS cable and DTS interrogator
Extension 5	Tool string 4C	Tool string 4A + 3 extra geophones

1.6 Objective, scope and content of the proposed Contract

The Contract for the design, delivery, and deployment of 4 borehole monitoring strings to be entered into, provides for the supply of products and the provision of services, as specified in detail in the Programme of Requirements and Preferences (Sections 8 and relevant Annexes). Following the present European open tender procedure, hereafter: (public) Procurement Procedure, TNO intends to award a contract in accordance with the Procurement Guide.

In general terms, the contract involves the elements outlined in the Table in Section 1.5 also to be found in the Format for Price Sheet Annex A03. TNO intends to purchase the base request, but the extensions will only be purchased if the budget is sufficient, which is not yet certain at the time of writing.

2 Procurement Procedure

The Procurement Procedure is conducted pursuant to the applicable rules under the Aw, the Dutch Public Procurement Act [*Aanbestedingswet*]. TNO has opted for the public procedure. This tender has been published on and will proceed through TenderNed, www.TenderNed.nl.

2.1 Schedule for the Procurement Procedure

The proposed schedule for the Procurement Procedure is as follows:

No.	Action points	Date
1.	Publication of Announcement of Contract (at www.TenderNed.nl)	10 March 2025
2.	Closing date for submission of questions by Tenderers	31 March 2025
3.	Issue of (final) Information Notice	14 April 2025
4.	Closing date and time for submission of Tenders	6 May 12:00 CET
5	Notification of Award Decision	28 May 2025
6.	Closing date for submission of supporting documents by intended beneficiary	4 June 2025
7.	Closing date for submission of challenges	17 June 2025
8.	Final award	18 June 2025 (or shortly after)

The dates are indicative. TNO reserves the right to change the dates, subject of course to the minimum periods as laid down in the Dutch Public Procurement Act [*Aanbestedingswet*]. Affected enterprises will be notified of any change in the schedule via TenderNed.

2.2 Tender conditions

As part of the Procurement Procedure, TNO applies the following conditions.

2.2.1 Agreement

Submission of the Tender implies that the Tenderer agrees to the terms and conditions of the Procurement Procedure and agrees to the contents of the Tender Documents, including any unwelcome answers in the Information Notice.

2.2.2 Formats

The Tenderer should use the formats as included in the Annexes to this Procurement Guide. It is expressly not permitted to make changes to these formats, unless TNO has expressly stated otherwise.

2.2.3 European Single Procurement Document (ESPD)

The Tenderer must submit an ESPD as specified in the instructions given below. The Tenderer must use the ESPD as appended in Annex **A01**.

To access and complete the ESPD electronically, the Tenderer must only use the Adobe Reader software program, preferably the latest version. Opening the ESPD in a program other than Adobe Reader may result in the ESPD appearing different from the version pre-filled by TNO and/or showing errors. Submission of an ESPD that differs from the version as provided by TNO with the Procurement Documents will render the Tender invalid, unless TNO considers this disproportionate in a specific case. The responsibility for opening the ESPD in the prescribed manner and submitting the correct version thereof rests with the Tenderer.

For legally valid signature of the ESPD, see Section 2.2.20 of this Procurement Guide.

2.2.4 Precedence of Procurement Documents

In the event of discrepancies between the contents of the various Procurement Documents, the following order of precedence applies during the Procurement Procedure, in descending order of prevalence:

- Contract
- Information Notice(s): from most recent to least recent;
- Procurement Guide including PoR and Annexes:
- General Purchasing Conditions of TNO
- Announcement.

2.2.5 Contact person and communication

All communication relating to the Procurement Procedure, with the exception of Section 2.3 "Further Information (questions)", will take place via TenderNed only and in the manner specified in this Procurement Guide.

If direct contact with TNO is specified/necessary, communication will take place exclusively with the TNO contact person stated below, in writing at all times, via the TenderNed messaging module.

Name	:	Raymond Peddemors
Position	:	Procurement Advisor
E-mail	:	via TenderNed
Department	:	Procurement
Postal address	:	PO Box 96800, NL-2509 JE The Hague

Tenderers cannot derive any rights from oral statements, undertakings and suggestions made by TNO employees and/or consultants in relation to the Procurement Procedure and/or the Procurement Documents. Tenderers may only rely on information provided in writing by or on behalf of TNO.

On penalty of exclusion, enterprises may not contact persons other than the contact person with regard to the Tender, unless TNO considers this disproportionate in a specific case. Nor is it permitted, on penalty of exclusion, to communicate with the contact person in any way other than via TenderNed, unless TNO considers this disproportionate in a specific case.

An instruction regarding digital procurement via TenderNed can be found by selected bidders in TenderNed's support environment (https://www.TenderNed.nl/cms/help). If you have any questions or are unclear about the operation of TenderNed (for example, if you are unable to log in or submit documents) or if TenderNed malfunctions, the TenderNed service desk can be contacted from 8.30 a.m. to 4.30 p.m. on working days on 0800 - 836 33 76 or via servicedesk@TenderNed.nl.

2.2.6 Language

Tenders must be written in the English language. Tenders in languages other than English will be excluded from participation. Official documents that cannot be submitted in the English language may be written in the language of the document's country of origin. Upon request, the Tenderer shall arrange a translation by a sworn interpreter-translator. The costs incurred shall be borne by the Tenderer.

2.2.7 Single Tender

An enterprise may only be involved in one (1) Tender: either as an independent Tenderer, a member of a Combination, or a subcontractor or Third Party. With regard to enterprises belonging to the same group as referred to in Sections 2:24b and 2:24c of the Dutch Civil Code, more than one company from the group may submit a Tender, provided that the enterprises demonstrate, at TNO's request, that the Tenders have been drawn up independently and autonomously.
Where this cannot be demonstrated by all the Tenderers concerned, all the Tenders emanating from enterprises belonging to the same group will be excluded.

2.2.8 Combination

A Combination of enterprises may submit a Tender jointly as a single Tenderer.
To do so, the following conditions must be met.

- All members of the Combination shall submit their own completed and validly signed ESPD. This states that registration takes place in Combination and, if selected, registered.
- The ESPD specifies which member of the Combination will fulfil the role of coordinator. The coordinator is the only member with which TNO corresponds regarding the Procurement Procedure and, where applicable, the Contract. The coordinator must have the power to legally bind all members of the Combination in respect of the Procurement Procedure and, where applicable, (the award of) the Contract.
- All members of the Combination must individually declare in their own ESPD whether they are subject to Grounds for Exclusion (see Section 5.1). The members of the Combination will each be assessed individually against the Grounds for Exclusion. If one or more Exclusion Grounds apply to one or more members, the entire Combination will be excluded.
- The Combination as a whole will be assessed against the Suitability Requirements, subject to any exceptions referred to in Section 5.2. In the ESPD, the Combination members declare how the Combination meets the Suitability Requirements. If the Combination as a whole does not meet all Suitability Requirements, the submission of the Combination will be laid aside.

By submitting the Tender, the Combination members declare that all the participants in the Combination are jointly and severally liable for the fulfilment of the obligations arising from the Procurement Procedure, as well as from any performance of the Contract. By submitting the Tender, the Combination members declare that the coordinator is authorised to validly represent the Combination and the individual Combination members in all matters relating to the Tender and, in the event of the award of the Contract, the Contract.

2.2.9 Subcontracting

A Tenderer may use one or more subcontractors to carry out the work. A cooperative venture in the form of a main contractor and subcontractors may tender as single Tenderer. The main contractor shall remain at all times responsible and liable for all work, including any work performed by a subcontractor. TNO recognises the following subcontractors:

Reliance on subcontractor to meet Suitability Requirements

Where the Tenderer relies on the financial and economic standing and/or technical and professional competence of a subcontractor to meet the Suitability Requirements, said subcontractor shall also be deemed a Third Party. In this case, the

Tenderer must follow the instructions as described in Section 2.2.10 concerning reliance on the resources of a Third Party or Parties. All Third Parties must be listed in Section IIC of the ESPD (Annex **A01**).

Deployment of subcontractor to perform the contract
Where a Tenderer meets the specified Suitability Requirements independently but wishes to use one of more subcontractors to carry out the work, the Tenderer need not disclose the identity of the subcontractor(s) in the Tender. While the Tenderer must tick the box in its ESPD, Part IID, to indicate that it intends to use subcontractors, their names need not be disclosed at this time. However, the Tenderer must do so not later than seven (7) calendar days after the provisional award, as TNO has to pre-approve the subcontractors to be used. If the Contractor wishes to replace a subcontractor during performance of the Contract, this will only be possible subject to TNO's prior consent in writing.

If a Tenderer wishes to use a subcontractor, a completed ESPD (Annex **A01**; parts IIA, IIB and III) must be submitted not later than seven (7) calendar days after the provisional approval of said subcontractor, as well as the supporting documents relating to the Grounds for Exclusion (Section 5). Where a subcontractor is subject to one or more Grounds for Exclusion and said subcontractor has not given convincing reasons in the ESPD why it should nevertheless not be excluded (see Section 5), the subcontractor will not be approved. Otherwise, approval of a subcontractor will not be unreasonably withheld.

If a Tenderer intends to use multiple subcontractors, a completed and duly signed ESPD (Annex A01) must be submitted from each subcontractor. The subcontractor has only to complete parts IIA, IIB and III of the ESPD. These ESPDs will be appended to the Tender.
The subcontractor's ESPD (Annex **A01**) must be duly signed. For signing authority, please refer to Section 2.2.20.

If the Tenderer does not intend to use subcontractors
The Tenderer should indicate its intention not to use subcontractor(s) by ticking only the "no" box in Part II D of the ESPD (Annex **A01**).

2.2.10 Reliance on Third Party resources?
The Tenderer may rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties.

If the Tenderer relies on the financial and economic capacity of a Third Party or Parties, both the Tenderer and the Third Party or Parties on whose financial and economic capacity the Tenderer relies will be jointly and severally liable for the obligations arising from the Procurement Procedure and for the obligations arising from the performance of the Contract, if awarded to the relevant Tenderer.

If the Tenderer relies on the technical and professional competence of a Third Party or Parties, said Third Party or Parties should also be involved in the performance of the Contract, if awarded to the relevant Tenderer.

No reliance on Third Party resources
If the Tenderer does not rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, it should complete Part II C of the ESPD (Annex **A01**) to indicate that it does not rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, by ticking the *"no"* box.

Reliance on Third Party resources

A) Requirements for submitting a Tender

If the Tenderer does rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, the Tenderer should complete Part II C of the ESPD (Annex **A01**) to indicate:

1. that it is relying on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, by ticking the *"yes"* box
2. the Suitability Requirements for which it relies on the Third Party or Parties and,
3. for each stated Suitability Requirement for which it relies on a Third Party or Parties, and the Third Party or Parties it relies on for that purpose.

In addition, if the Tenderer relies on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, it shall submit the following:

4. a separately completed and duly signed ESPD (Annex **A01**) from each Third Party on whose financial and economic standing and/or technical and professional competence it relies, in which the Third Party completes Parts II A, II B and III in respect of the Third Party itself. The ESPDs of the Third Party or Parties must be duly signed as referred to in Section 2.2.20.

Additional requirement for submitting a Tender in the event of reliance on technical and professional competence of a Third Party or Parties

5. If and insofar as the Tenderer relies on the technical and professional competence of a Third Party or Parties, the Tenderer must submit a list of reference projects completed by the Third Party or Parties on whose technical and professional competence the Tenderer relies, in addition to any list of its own reference projects to be submitted by itself with its Tender. If and insofar as the Tenderer submits reference projects of a Third Party or Parties, it must also use the Format for Reference projects (Annex **A02**) for this purpose.

B) Requirements for intended beneficiary relying on a Third Party or Parties

The Tenderer to which TNO intends to award the Contract on the basis of the Award Decision and which relies on the financial and economic standing and/or technical and professional competence of a Third Party or Parties must submit at TNO's request within the period specified in Section 7.1 of the Procurement Guide:

1. a declaration by said Third Party or Parties stating that the Tenderer can actually access the resources of the Third Party or Parties relied upon. If the Tenderer relies on the financial and economic standing of a Third Party, it shall submit a declaration in the format provided in Annex **B01**. If the Tenderer relies on the technical and professional competence of a Third Party, it shall submit a declaration in the format provided in Annex **B02**;

2. any evidence as referred to in Section 5.1, which allows the Third Party or Parties whose suitability the Tenderer relies on to demonstrate that the Grounds for Exclusion do not apply to the Third Party.

Additional requirement for intended beneficiary in the event of reliance on financial and economic standing of a Third Party or Parties

3. The Tenderer to which TNO intends to award the Contract on the basis of the Award Decision and which relies on the financial and economic standing of a Third Party or Parties must, at TNO's request, submit within the period specified in Section 7.1 of the Procurement Guide, in addition to the documents referred to above under B) (regarding "*Requirements for the Intended Beneficiary*"): the documents that will be substituted for those that the Tenderer must submit to prove that it meets the Suitability Requirements regarding financial and economic standing.

2.2.11 Variants

Offering variants and/or alternative Tenders is not permitted and they will therefore be disregarded.

2.2.12 "Or equivalent"

The technical specifications are formulated as much as possible on the basis of EU and other standards, performance requirements and functional requirements. Where the Procurement Documents, including the Annexes, nevertheless refer to brand names, patents, types, manufacturing processes, etc., the Tenderer should read "or equivalent" after the relevant phrase.

Tenderers are free to provide an equivalent product, service or type of work. If they do so, the Tenderers must justify in or with their Tender why they are offering an equivalent product, service or type of work. It is up to TNO to assess whether the latter are actually equivalent. TNO reserves the right to have their equivalence assessed by a third party if necessary.

2.2.13 Rights reserved by TNO

1. TNO reserves the right to stop the entire Procurement Procedure temporarily or permanently. If TNO decides to discontinue the Procurement Procedure, legal protection is guaranteed in accordance with paragraph 2.4 of the Procurement Guide.

2. TNO reserves the right at all times to subject the data and statements provided by Tenderers to further investigation and verify their accuracy (or have them verified), as well as to approach any references provided, without prior notification thereof to Tenderer. The results thereof will be considered in the assessment of the Tender.

The Tenderer is aware that if at a later stage it is found that incorrect and/or incomplete information has been provided and/or that requirements set out in the Procurement Documents are not or no longer being met, the Tenderer will be excluded from further participation in the Procurement Procedure or agreements already made may be cancelled and contracts dissolved. In such cases, TNO cannot be held liable for the consequences thereof for the relevant Tenderer and TNO will not be obliged to reimburse any costs and/or any loss or damage of any kind.

2.2.14 Confidentiality

The Tenderer will observe strict confidentiality in respect of all information that is or becomes known to it through TNO. It will not make the information available to Third Parties and will only disclose it to its staff, including consultants, subcontractors and Third Parties, insofar as this is necessary for the submission of the Tender or – if and insofar as applicable – the performance of the Contract.

TNO acknowledges the confidentiality of the Tenderer's Tender and will not disclose to Third Parties any information known to it from this source. It will be necessary to disclose information from the Tender, where appropriate, in the context of justifying the Award Decision. The Tenderer recognises this and agrees accordingly.

2.2.15 Distortion of competition

Distortion of competition will result in exclusion. If TNO suspects that distortion of competition has occurred, it will give the relevant Tenderer(s) the opportunity to demonstrate that it has not been guilty of distorting competition. If TNO deems that the Tenderer has failed to do so, the Tenderer will be excluded from further participation in the Procurement Procedure.

2.2.16 Withdrawal by Tenderer

Any Tenderer who has submitted a Tender may withdraw it until the closing date for tenders. After that moment, the period of validity starts. The Tender is irrevocable during the period of validity.

2.2.17 Period of validity
The Tenderer upholds its 90 calendar days from the closing date for submission of the Tender (Section 2.1). The period of validity is automatically extended until the final conclusion of the Contract with the first-ranked Tenderer.

If summary proceedings are instituted against the Award Decision, the period of validity will be automatically extended by a period of thirty (30) calendar days from the date of the decision of the preliminary relief judge. TNO may request Tenderers to extend the period of validity. Tenderers cannot derive from this any right to be awarded the Contract.

2.2.18 Contract terms
The Contract will be awarded in accordance with:

- Contract (the Purchase Order provided to the Contractor, referring to this Tender procedure and the Tender concerned);
- General Purchasing Conditions of TNO, February 2022, as included in Annex **C03**, except insofar as they are explicitly departed from in the Procurement Documents.

In accordance with Section 2.3 of this Procurement Guide, Tenderers may submit text and amendment proposals for this Contract and the General Purchasing Conditions of TNO. The final Information Notice will respond to these proposals or add the final Contract and General Purchasing Conditions.

The general terms and conditions (including terms of supply) or terms and conditions of Third Parties (including subcontractors and auxiliary persons) used by the Tenderers, both during this Procurement Procedure and also, in the event of award, during the performance of the final Contract and any contracts to be concluded under its terms, are expressly rejected by TNO. If they declare their own terms and conditions applicable, this will render their Tender invalid.

In the final Information Notice, TNO will indicate where final changes have been made. Agreement/Acceptance of the Final Contract and General Purchasing Conditions of TNO is a minimum requirement. Failure to comply with these conditions will result in the Tenderer's exclusion from further participation in the procedure.

2.2.19 Conditional Tender
TNO will exclude conditional Tenders from further participation in the Procurement Procedure.

2.2.20 Legally valid signature
The Tender must be validly signed. "*Validly signed*" means that the ESPD has been signed by the duly authorised representative(s) of the Tenderer as stated in TenderNed. A validly signed ESPD means that the Tender as a whole has been validly signed, unless a separate valid signature is required for one or more documents. TNO would point out that the trade register may state that two or more persons are joint authorised representatives, or that a representative is authorised only up to a certain monetary value. This has implications for the authority to sign and Tenderers should anticipate this.
The authority to sign should be evidenced by an extract from the trade register. It is also possible for the Tender to be signed by a proxy. In this case, a power of attorney must be issued by a legally authorised representative of the Tenderer, as evidenced by the trade register, or the power of attorney must be recorded in the trade register.

The extract or the power of attorney need only be issued to TNO if a request to that effect has been made by TNO, as specified in the requirements set out in Section 7.1 of the Procurement Guide.

A Tender not validly signed shall be deemed not to have been made and shall be invalid.

This provision also applies to the ESPD submitted by members of a Combination and/or for the Third Party or Parties on whose standing/experience/resources the Tenderer relies. In their case too, only the ESPD need be validly signed and this signature will also serve as a valid signature for other documents completed and submitted by them.

Electronic signature
Signature in the form of an electronic signature is also permitted. The following requirements apply in this regard: an E-recognition tool ("eHerkenning" in Dutch) with at least security level 4 (EH4) must be used.

2.2.21 Reimbursement of expenses incurred in submitting the Tender
Any expenses incurred by Tenderers in preparing and submitting the Tender will not be reimbursed.

2.2.22 Statement of prices and expenses
Prices and costs must be stated in euros excluding VAT and will be fixed for the term of the Contract unless otherwise specified. TNO hereby explicitly states that no price negotiations will be entered into as part of this Procurement Procedure.

2.2.23 Publicity
No publicity will be given to the Procurement Procedure by the Tenderer or by partners and/or subcontractors to be engaged by the Tenderer except with TNO's consent in writing. All information on the Tender will be treated confidentially by Tenderer and the parties to be engaged by them.

2.2.24 Intellectual property
Subject to exceptions as specified in the Dutch Copyright Act [*Auteurswet*], no part of the Procurement Documents may be reproduced (other than for the purpose of submitting a Tender) in any manner whatsoever without TNO's consent in writing.

Tenders and all Annexes submitted by Tenderers as part of the Procurement Procedure will become TNO's property upon receipt.

2.2.25 TNO logo
The TNO logo may not be copied, altered or otherwise used on documents submitted by the Tenderer as part of the Procurement Procedure.

2.3 Further information (questions)
The Procurement Documents shall be prepared with the utmost care. Tenderers may request further information on the Procurement Procedure and/or the Procurement Guide up to the closing date and time "closing date for submission of questions" as stated in the schedule in Section 2.1. Said further information may, for example, address any lack of clarity, ambiguities, discrepancies. Further information should be requested within the time limit and in the manner described in this section. Questions and comments not submitted on time and/or correctly will in principle not be dealt with in the Information Notice, except in cases where this is deemed necessary and/or desirable at TNO's sole discretion.

Moreover, at the time of the above deadline, Tenderers will have the opportunity to ask reasoned questions on, or propose text or amendments to the General Purchasing Conditions of TNO, Annex **C03**. Text proposals will serve only to improve the Contract and must not affect its essence. TNO would point out that it reserves the right at all times to accept or not to accept these text or amendment proposals.

If the Tenderer fails to raise questions about and/or challenge to (lack of clarity, ambiguities or discrepancies in) the Procurement Procedure and/or the Procurement Guide and/or in the manner described in this section, or does not do so in a timely manner, it will forfeit its right to challenge any deficiencies identified at a later stage, e.g. in interlocutory proceedings.

Questions and/or comments should be communicated **exclusively** to the TNO contact person (see Section 2.2.5) using the "Standard Template for Tenderer Questions" in Annex **C01** ("editable" MS Excel file) prepared by TNO. Using the "pull-down" menu in this Excel file, the Tenderer should indicate which section of the Procurement Guide the question relates to.
Once completed, Annex **C01** should be submitted via the TenderNed messaging module.

TNO is therefore **not using the question module in TenderNed**. Questions submitted in this question module will not be considered.

The TNO contact person will include the questions and/or comments and their answers in anonymised form in one or more Information Notice(s). The final date for asking questions is included in the schedule in Section 2.1.
The Information Notice(s) will be published at www.TenderNed.nl as per the schedule in the table in Section 2.1.

All the questions and their answers should be considered an integral part of this Procurement Guide. The basic premise is that the Procurement Guide will be deemed final after publication of the last Information Notice.

TNO may decide to hold one or more additional briefing rounds. Parties will be informed of this in the Information Notice. Questions and comments submitted as part of an additional briefing round may relate solely to the contents of the immediately preceding Information Notice. Questions and comments that do not relate to the immediately preceding Information Notice may be disregarded by TNO – without notice.

The responsibility for submitting questions and/or comments in a timely and correct manner rests with the Tenderer. Questions raised after the expiry of the deadline will in principle not be answered in the Information Notice unless answering is necessary, in TNO's opinion, for the submission of a proper Tender.

TNO would advise Tenderers to wait until the last Information Notice is published before submitting their Tender as the Information Notice may contain further clarifications and amendments to the Procurement Guide that are relevant to the preparation of the Tender.

TNO would expressly remind Tenderers that it can answer their questions in confidence (Section 2.53(3) Aw). If a Tenderer does not wish to have a question answered in the Information Notice, the Tenderer must give reasons as to why a public answer would damage its legitimate economic interests. TNO will take a decision on whether or not to answer a question in confidence based on these reasons. If TNO decides not to do so, it will notify the questioner accordingly, giving reasons. The questioner will then have the option of withdrawing or submitting its question for the Information Notice.

2.4 Applicable law and disputes
This Procurement Procedure is governed by the laws of the Netherlands. The Preliminary Relief Judge at the District Court of The Hague shall have exclusive jurisdiction to settle disputes relating to the present Procurement Procedure.
Tenderers should bring their challenges to all or part of the Procurement Procedure, to all or part of the information provided or to other aspects relating to the Procurement Procedure to the attention of the TNO contact person (see Section 2.2.5) at the shortest possible notice.
The period within which legal action must be taken against the Award Decision and/or the Procurement Procedure is twenty (20) calendar days from the date of the Award Decision. Any summons should be served within this period, which is a (contractual) expiry date, at TNO's address. If this objection period, also expiry date, is exceeded without legal proceedings having been commenced by service of a summons, any right to do so shall (inadmissible) lapse. The standstill period is

automatically extended to the next working day if the standstill period ends at the weekend, on a public holiday or a so-called "notice-free day" [when bailiffs cannot issue writs].

A Tenderer wishing to initiate summary proceedings is requested to request foreclosures from TNO.

If a summons has been served within the standstill period, the relevant Tenderer is requested to send a copy of the served summons via TenderNed to the contact person for the Procurement Procedure no later than two (2) working days after service. This is because the processing of documents within TNO can lead to delays in processing the summons.

If a Tenderer institutes summary proceedings in a timely and valid manner in respect of the Award Decision and/or the Procurement Procedure, the Tenderer to which the contract has been provisionally awarded shall intervene in the summary proceedings. If the Tenderer to which the Contract has been provisionally awarded does not intervene, said Tenderer shall exercise the right to institute court proceedings or third-party proceedings in the event that the judgment in the first-instance summary proceedings orders the amendment or revocation of the Award Decision. This is because it is important for all the parties to obtain clarity as soon as possible and put all the arguments on the table in the first instance. If the standstill period is exceeded, this situation cannot be remedied.

Any Tenderer that has instituted summary proceedings is obliged to provide a copy of the summons when requested to do so by other Tenderers so that said Tenderer(s) can determine whether intervention is appropriate. Of course, it is up to the Tenderer that initiated the summary proceedings to determine whether or not confidential business information will be disclosed at that stage and, if so, which. If the Tenderer that initiated the summary proceedings does not (expeditiously) provide a copy of the summons to the Tenderer requesting it, TNO reserves the right to provide a copy of the summons itself. In doing so, TNO will determine at its own discretion whether confidential business information will be deleted and, if so, which.

If summary proceedings have been instituted in a timely and legally valid manner and the judgment does not oppose the conclusion of the Contract, TNO will be free to enter into the Contract. TNO is not obliged to await any appeal or proceedings on the merits. In other cases, TNO will consider the next steps to be taken based on the judgment in first instance.

2.5 Submission of the Tender

2.5.1 Digital tendering

The Tender consists of the completed and, where necessary, validly signed Annexes **A01 to A04,** the formats of which are appended as Annexes to the Procurement Guide. When the ESPD is validly signed, the Tender as such is also validly signed. The absence of a legally valid signature on the ESPD will render the Tender invalid.

For legally valid signatures, see Section 2.2.20.

For this Tender, TNO is using a digital procurement system via TenderNed. The Tender must be uploaded to the TenderNed digital vault not later than the date and time specified in the schedule in Section 2.1 under "Closing date for submission of Tenders". After uploading, the Tenderer will receive a transaction code via SMS. This code must be entered in TenderNed. The Tender is not actually submitted until the correct transaction code has been entered. The SMS code must therefore be entered within the tendering period for the Tender to be deemed complete and correct.

Tenders received late and/or Tenders not deposited in the digital vault and/or Tenders submitted by means other than via TenderNed will not be considered and will therefore be excluded from participation. Tenderers will remain at all times solely responsible for submitting their Tender on time and in the correct manner.

Tenderers are strongly advised to take careful note of the guide provided by TenderNed for the digital submission of Tenders, particularly as regards placing documents in the digital vault. In doing so, uploading should be completed with the tendering wizard (authorisation by SMS code).

Tenderers are advised to start uploading documents in good time. If a Tenderer experiences problems with the system due to a malfunction of TenderNed, the TNO contact person (Section 2.2.5) and TenderNed should be contacted without delay. In the event that a TenderNed malfunction actually occurs, as a result of which the submission of Tenders is not possible, shortly before the closing date and TNO has not taken note of Tenders that have been uploaded to the TenderNed digital vault on time despite the malfunction, TNO will extend the closing date for submission of Tenders pursuant to Section 2.109 Aw.

TNO further advises Tenderers to take note of the content of Section 2.109a Aw and, in accordance with the provisions of that section, to be prepared to submit the encrypted version of their Tender in a timely manner if occasioned by TenderNed malfunctioning.

2.5.2 Sending and grading Tender

The Tender consists of the following documents. Documents in **Part A** relate to the Tenderer. Documents in **Part B** relate to either Third Party(ies) whose experience/resources the Tenderer appeals to under the Eligibility Requirements and/or the Declaration of Willingness of Tenderer for the required insurance. The documents under **Part B** need to be submitted only if Third Party(ies) are invoked or if Tenderer is not (yet) in possession of either the insurance company's policy or satisfactory statement within the stipulated timeframe.

Part A Submission of the Tender

The Tender consists of the following components on pain of invalidity.

Annex A01 European Single Procurement Document (Tenderer, if applicable: all individual Combination members; the individual Third Party or for the benefit of one or more subcontractors to be used for the work).

Annex A02 Format for Reference Projects

Annex A03 Format for Price sheet

Annex A04 Compliance to Requirements - Answers to Preferences (**two tab sheets**)

The above sheets must be completed in full. Only the ESPD need be validly signed.

Gather the pdf files, Annexes **A01** to **A04**, as separate "loose" files into a compressed file (zip file) named: **"....."_part A.** The Tenderer should replace the dotted line with all or part of its company name. Upload this compressed file to TenderNed's digital vault.

Part B Submission of supporting documents

Annex B01 Declaration as to Reliance on Financial and Economic Standing of Third Party or Parties

Annex B02 Declaration as to Reliance on Technical and Professional Competence of Third Party or Parties

Annex B03 Declaration as to Insurance Policy

The above sheets must be completed in full. Only the ESPD need be validly signed.

Gather the pdf files, Annexes **B01** to **B03** as separate "loose" files into a compressed file (zip file) named: **"....."_part B.** The Tenderer should replace the dotted line with all or part of its company name. Upload this compressed file to TenderNed's digital vault.

3 Assessment of Tenderers and Tenders

3.1 Assessment team

A team of subject-matter and process experts has been constituted to conduct a qualitative assessment of the Tenders (assessment of the Tenders on the qualitative Award Criteria). The assessment team assesses the quality of the Tenders without having any knowledge of the financial part of the Tenders.

The members of the assessment team assess, on a strictly personal basis and independently, the elaboration of the qualitative (sub-sub-)award criteria for the Tenders. For these criteria, see section 6.1.2 and its elaboration in Chapter 8. In a meeting of the individual assessors, the average of the individual scores is then determined.
The average of the individual scores then determines the overall score for a sub-sub-award criterion. Average scores are rounded to one decimal place.

In the announcement of the Intention to Award, TNO will state the numbers of completed points per (sub-)sub-award criterion. The total score for sub-award criterion: Quality (QY) has been arrived at by totalling unrounded scores on the sub-sub-award criterion, after which this total score is rounded to a whole number for the purpose of said announcement.

3.2 Assessment procedure

The assessment procedure is as described in the following sections.

Section 4 : concerns the assessment of the timeliness, formal requirements and completeness of the Tender submitted.

Section 5 : concerns requirements formulated in respect of Grounds for Exclusion and Suitability Requirements. If one or more Grounds for Exclusion apply and/or if a Tenderer fails to meet the Suitability Requirements, the Tenderer will be excluded/the Tender will be invalid.

Section 6 : concerns the description of the assessment by TNO of the Tenders against the Award Criterion. The Award Criterion is assessed by allocating points to the Tender

Section 7 : concerns the assessment of supporting documents and other documents requested by TNO from the intended beneficiary.

Section 8 : this describes the assessment carried out by TNO in respect of the Minimum Requirements. This involves assessing TNO's requirements and preferences for the performance of the Contract, i.e. the Programme of Requirements and Preferences ("PoR"):

TNO assesses and ranks the Tenders on the basis of the Award Criterion: Best Value for Money (BVM), see Section 6 in this regard.

TNO may ask the Tenderer for clarification with regard to the submitted Tenders up to the end of the Procurement Procedure. The Tenderer is deemed to be willing and able to answer questions within 48 hours of sending the questions. If questions are not answered (in a timely manner), TNO may interpret the Tender in any manner it sees fit, based on the documents known to it.

4 Assessment of timeliness, formal requirements and completeness

4.1 Assessing timeliness of submission

The Tender must be submitted in a timely manner, i.e. within the tendering period (see Section 2.1). Tenders not submitted in a timely manner are invalid and TNO will discard them.

4.2 Assessing for other formal requirements and completeness

Tenders submitted by means other than through TenderNed will not be assessed and will be discarded. The foregoing is subject to any malfunctions of TenderNed, recognised as such by TenderNed.

The Tenders will be assessed as regards completeness and the formal requirements applicable in the Procurement Procedure, including at all events the legally valid signature. Tenders that are incomplete and/or fail to meet all the formal requirements will be declared invalid by TNO and discarded. Missing answers, documents, or data will result in exclusion if there is no rectifiable omission. Tenderers are reminded that TNO is not obliged to have deficiencies rectified. TNO has the discretionary power to offer a rectification option.

If – for whatever reason – a question cannot be answered or the requested data cannot be submitted in full or at all, this must be explicitly stated at the time of the Tender, together with reasons. Depending on the nature of the deficiency, TNO will assess whether the Tender is invalid, in which case it will be discarded, or whether the deficiency is amenable to rectification.

Deficiencies for which TNO offers a rectification option must be rectified within the timeframe as stated in the relevant request from TNO. If a deficiency is not rectified within the notified period or at all, the Tender will be invalid after all.

5 Assessment of Grounds for Exclusion and Suitability Requirements

5.1 Assessing Grounds of Exclusion

The Tenderer will be assessed in terms of the Grounds for Exclusion listed in the ESPD (Section III). The Tenderer declares in the ESPD whether the Grounds for Exclusion used are applicable or not at the time of tendering. Where one or more Grounds for Exclusion apply, the Tenderer will generally be excluded. The Tenderer will have the opportunity to give reasons in the ESPD why it should not be excluded after all because of self-cleansing measures or at least why exclusion would be disproportionate. TNO will take these reasons into account in its decision on the final exclusion of the Tenderer. The reasons must be included in or appended to the ESPD. Tenderers may not continue to submit and/or alter the reasons once the tendering period has elapsed.

If the Tenderer is a Combination and a Ground for Exclusion applies to any of the participants in that Combination, the Combination as a whole will be excluded. Each Combination member must submit its own legally signed ESPD.

If the Tenderer relies on the suitability of a Third Party or Parties as described in Section 2.2.10 of the Procurement Guide and a Ground for Exclusion applies to one or more Third Parties, TNO will reject its reliance on the suitability of the Third Party or Parties in question. If the Tenderer, whose reliance on a Third Party or Parties has been rejected, fails – after having been given the opportunity to do so by TNO – to rely (in a timely manner) on the resources of a substitute Third Party or Parties, or if the Tenderer does rely on a substitute Third Party or Parties but fails to comply fully or at all with the requirements set for that purpose, the Tenderer will be excluded from participating in the Procurement Procedure. The substitute Third Party or Parties must be proposed within seven (7) calendar days of a request to that effect from TNO, submitting all the documents requested in the Procurement Documents for that purpose. Proposing a substitute Third Party is not considered an amendment to the Tender. If a Tenderer is permitted to propose a substitute Third Party, the Tenderer may only substitute the Third Party while submitting the relevant documents in this connection. Other parts of the Tender, including, but not limited to, the elaboration of the award criteria remain unchanged.

The completed and validly signed ESPD will suffice in the first instance as evidence that the Grounds for Exclusion do not apply to the Tenderer. At TNO's request, the Tenderer to which TNO intends to award the Contract will provide – by the date specified in Section 7.1 of the Procurement Guide – the supporting documents referred to in section 7.1. If the Tender is submitted in Combination, all the Combination members must submit the supporting documents listed below. If the Tenderer relies on the standing/resources/experience of one or more Third Parties, then the supporting documents listed below from each Third Party should be submitted.

Tenderers are reminded that it may take several weeks to obtain some supporting documents. Tenderers are therefore advised to request the supporting documents at the earliest possible stage so that they can be supplied in a timely manner – in response to any request from TNO. TNO would point out that any Tenderer relying on a Third Party is itself responsible for the timely submission of supporting documents in respect of the Third Party's ESPD. TNO therefore advises Tenderers to inform, in a timely and appropriate manner, Third Parties on whose suitability they rely which documents may be requested by TNO in the event of award to the Tenderer and the time required to obtain these documents.
Failure to obtain supporting documents in a timely manner or at all remains at the Tenderer's risk. If the supporting documents are not supplied in a timely manner and/or complete, the Tenderer will still be excluded. If a supporting document has not been obtained in a timely manner, but has been requested in good time and the failure to obtain it is not due to a circumstance within the Tenderer's sphere of risk, the Tenderer will not be excluded. To this end, the Tenderer must demonstrate that the relevant supporting document has been requested not later than two (2) working days after publication of the announcement of the Procurement Procedure.

5.2 Assessing Suitability Requirements

The Tenderer must, at the time of Tendering, possess a certain minimum level of expertise and ability to perform the contract: the Suitability Requirements.
The Tenderer will be assessed on the Suitability Requirements. If the Tenderer relies on the suitability of a Third Party or Parties as referred to in Section 2.2.10 of the Procurement Guide, TNO will assess whether the Third Party or Parties meets the specified Suitability Requirements, for which the Tenderer relies on said Third Party or Parties.

The Suitability Requirements refer to the required financial and economic standing, technical and professional ability and professional competence that the Tenderer must meet in order to be eligible to submit a Tender.

The Tenderer must meet all the Suitability Requirements at the time when the Tender is submitted. If the Tenderer fails to meet all the Suitability Requirements, with or without relying on one or more Third Parties, the Tender will be invalid.

If tendering in Combination, the Combination as a whole must meet the Suitability Requirements and in principle not all the individual Combination members. However, this may be different for a specific Suitability Requirement.

5.2.1 Financial and economic standing

5.2.1.1 Insurance

The Tenderer must be insured against business liability and/or professional liability, with cover of at least € 1,250,000 per loss-causing event or series of related events, or be willing and able to arrange said insurance cover in the event of an

Intention to Award. The Tenderer is responsible for ensuring that, if awarded Contract, it remains insured at least in accordance with this requirement during the term of the Contract. The Contractor will inform TNO without delay of any changes to the insurance policies. If the Contractor's insurance does not or no longer meets this Suitability Requirement during the term, TNO will be entitled to dissolve the Contract without notice of default or judicial intervention and without being liable to pay compensation to the Contractor.

Ticking the "*yes*" box in Part IV of the Tenderer's ESPD (Annex **A01)** will suffice in the first instance as evidence that the Tenderer meets this requirement.

At TNO's request, the Tenderer whose Tender was ranked first will provide the evidence of insurance within the set timeframe as referred to in Section 7.1. This supporting document comprises a policy showing the required insurance cover, the insurance contract, the policy schedule or a satisfactory declaration from the insurance company showing that the Tenderer is insured as required in the Procurement Documents. If a group policy is submitted, the Tenderer must supply a copy thereof to demonstrate that it is jointly insured.

If the Tenderer does not (or not yet) have the insurance company's policy or satisfactory declaration in its possession within the set timeframe, it should sign a Declaration of Readiness instead (Annex **B03**). By signing this declaration, the Tenderer declares that it will provide a copy of the policy or of a satisfactory statement by the insurance company within seven (7) calendar days after the notification by TNO that it intends to enter into the Contract with the Tenderer under the suspensive condition of the required insurance, based on the assessment of the supporting and other documents already submitted (see Sections 7.1 and 7.2). Said notification will be issued by TNO only after the standstill period has expired without summary proceedings being instituted or – where summary proceedings have been instituted – the relevant judgment states that the Award Decision can be upheld. The Contract will be not be entered into until such time as evidence of the Tenderer being adequately insured has been received. If the Tenderer is unable to provide the required insurance policy or a satisfactory declaration from the insurance company within the set timeframe, the Contract will not be concluded and TNO will retain the right to award the Contract to the Tenderer which would be ranked in first place after the number one was eliminated in accordance with the assessment system, and which has stood by its Tender.

5.2.2 Technical and professional competence

Competence requirements state the degree to which Tenderers may be considered capable of performing the actual activities under the present Contract as required.

5.2.2.1 Reference projects

The Tenderer should demonstrate experience in the required core competences by providing details of reference projects. The Tenderer should cite one reference project for each core competence. The Tenderer may cite the same reference project to fulfil the different core competences.

As evidence that the Tenderer has experience in the core competences listed below, the Tenderer shall cite the required reference projects immediately upon submission of the Tender. To this end, the Tenderer should submit a fully completed Annex **A02** for each core competency. If the Tenderer uses one reference for multiple core competences, then a completed Annex **A02** must be submitted for each core competence. The completed Annex **A02** must show that the reference project cited fulfils all aspects of the core competence. Additions or amendments to the details in Annex **A02** are not permitted after the expiry of the tender date.

If the Tenderer relies on the technical and professional competence of a Third Party or Parties, the Tenderer shall submit for each core competence for which it relies on the relevant Third Party or Parties an Annex **A02** fully completed by said Third Party or Parties.

If a project is cited that has not yet been (fully) completed, only the actual results achieved under the current Contract may be stated and a forecast of results is not sufficient.

TNO has identified the following core competences that correspond to the desired experience in key areas of the present Contract.

Core Competence 1: The Tenderer has experience in providing downhole sensors to detect seismic events.

Reference project: The Tenderer must have delivered a project that fulfils Core Competence 1 in the past 5 years from the date of Announcement of this Procurement Procedure and whose contract value was a minimum of € 250.000 excluding VAT. The project should have been delivered in accordance with the conditions agreed at the time, including the completion date and budget.

Core Competence 2: The Tenderer has experience in the installation of seismic monitoring equipment downhole.

Reference project: The Tenderer must have delivered a project that fulfils Core Competence 2 in the last 5 years from the date of Announcement of this Procurement Procedure and whose contract value was at least € 100.000 excluding VAT. The project should have been delivered in accordance with the conditions agreed at the time, including the completion date and budget.

TNO reserves the right to check references with the referee without involving the Tenderer. TNO assumes that the Tenderer has informed the referees accordingly. The information obtained by TNO from the referent will be taken into account in the assessment of the Tender.

If the Tenderer has not demonstrated in its Tender that it has the required experience in all the core competences, this will result in the Tender being rendered invalid.

5.2.3 Professional competence

By completing the ESPD (Annex **A01**) and ticking the "*yes*" box in Part IV, the Tenderer declares that it is registered in the professional or trade register in accordance with the regulations of the Member State in which it is based.

At TNO's request, the Tenderer to which TNO intends to award the Contract within the period specified in Section 7.1 of the Procurement Guide will provide relevant evidence:

- for enterprises based in the Netherlands, an extract from the trade register of the Chamber of Commerce must be submitted, which is not more than six months old at the time of submission of the Tender. For enterprises based outside the Netherlands, a similar document should be appended in accordance with the applicable regulations of the relevant country in which the enterprise is based;

- where the Tenderer is a partnership or general partnership, the Tenderer shall submit the extracts of those that form the partnership/general partnership (if recorded in the trade register) as well as a declaration signed by all the partners showing the power of representation for the purposes of this Tender;

- where the Tenderer is a Combination, the Tenderer shall submit extracts from all participants in that Combination, and;

- where the Tenderer submits a Tender relying on the standing/capacity/experience of one or more Third Parties, the Tenderer shall submit extracts from all Third Parties or subcontractors, as the case may be.

5.2.4 Legal suitability to perform an assignment

On 8 April 2022, the EU adopted a fifth sanctions package regarding the Russian war in Ukraine (Council Regulation 2022/576). In that package, contracting authorities are prohibited from granting assignments to (1) natural persons with Russian nationality or legal entities established in Russia, (2) legal entities that are owned for 50% or more by one of the natural persons or legal entities referred to under (1), and/or (3) natural persons or legal entities acting in the interests or on the instructions of a natural person or legal entity referred to under (1).

TNO applies the above requirements as a suitability condition for this Procurement Procedure. A Tenderer will be legally unsuitable to perform the assignment (Section 2.90(4) of the Dutch Public Procurement Act (*Aanbestedingswet*)), and its Tender will be invalid, if:

1) the natural persons have Russian nationality or the legal entities are domiciled in Russia; and/or
2) they are legal entities that are owned for 50% or more by natural persons or legal entities referred to under (1); and/or
3) they are natural persons or legal entities acting in the interests or on the instructions of a natural person or legal entity referred to under (1).

The Tenderer must therefore demonstrate in its Tender that:

1) the Tenderer does not have Russian nationality and/or is not domiciled in Russia; and
2) the Tenderer is not owned for 50% or more by a natural or legal person referred to under (1); and
3) the Tenderer is not acting in the interests or on the instructions of a natural or legal person referred to under (1), including the payment of monies to a natural or legal person referred to under (1), whether or not it is legally obliged to do so and whether or not it is actually possible at present.

If one or more of the above three (3) requirements cannot be demonstrated, the Tender will be invalid.

Where the Tenderer tenders in Combination, this requirement shall apply to all the individual Combination members. Where the Tenderer relies on the standing/resources/experience of one or more Third Parties, this requirement shall also apply to the Third Parties on whose standing/resources/experience the Tenderer relies. If the Tenderer wishes to use one or more subcontractors during the performance of the Contract, the Contractor will have to demonstrate – for that subcontractor – that it meets this requirement at the time a subcontractor is presented to TNO for approval.

Ticking the "*yes*" box in Part IV of the Tenderer's ESPD (Annex **A01)** will suffice in the first instance as evidence that the Tenderer meets this requirement.

To this end, the Tenderer to which TNO intends to award the Contract within the set timeframe as referred to in Section 7.1, shall provide the means of proof relating to this Suitability Requirement. This concerns the following documents:

a) a recent (not older than six (6) months from date of Tender) extract from the trade register reflecting the most recent state of affairs; and

b) an up-to-date report on the holding structure (where the Tenderer is part of a holding structure) showing the direct and indirect ownership relationships of the Tenderer; and
c) a copy of the Tenderer's current articles of association.

In addition, the Tenderer shall declare categorically not to supply products - including semi-finished and finished products - listed in Annex XVII of the European Commission Regulation (EC) No 833/2014 on Russia Sanctions. When supplying products covered by this Annex XVII, the Tenderer shall provide as proof a Mill Test Certificate (MTC), or similar certificate such that it meets the requirements and obligations to establish the country of origin.

The Tenderer must continue to meet the Suitability Requirement. TNO will be entitled to verify this during the term of the Contract. If it becomes apparent during the term of the Contract that the Contractor does not meet – or no longer meets – the Suitability Requirement, TNO will be entitled to terminate the Contract with immediate effect, without being liable to pay damages to the Contractor and without the necessity of a notice of default or judicial intervention.

6 Assessment of Award Criterion

TNO assesses and ranks the Tenders based on the Award Criterion: Best Value for Money (BVM). The Tenderer with the highest overall score is deemed to have submitted the 'Most Economically Advantageous Tender' and is therefore provisionally awarded the contract.

6.1 Award Criterion: Best Value for Money (BVM)

This criterion is divided into the following sub-award criteria, with the corresponding weighting factors, where the assessment of the sub-award criteria: Price TP, (Total Price) and Quality (QY) is scored by setting a number of point scores to be achieved.

Award Criteria	Max. points score
Price (TP, Total Price)	**500**
Quality (QY)	**500**
Total	**1000**

The Tender with the highest total points score will be designated as Best Value for Money "BVM", on the basis of which TNO intends to award the Contract. See also Section 6.2 Award.
Point scores for each sub-award criterion will be rounded to one (1) decimal place. Total points are scored for each sub-award criterion by adding up unrounded point scores. In the announcement of the Intention to Award, TNO will state the rounded points scores allocated to each (sub-)sub-award criterion.

If the Tenderers with the highest Total Score have an equal Total Score, the Contract will be provisionally awarded to the Tenderer with the highest score for the sub-sub-award criterion **Preference 8.8.4 Quality & Durability**. If these scores are also equal, a draw will be held among the Tenderers with equal scores which are eligible for award. The protocol for the draw, if any, will be shared with the Tenderers among which lots will be drawn.

If, after the provisional award, the Tenderer with the highest score nevertheless proves to be invalid/is excluded from the procedure, the Tenders will be reassessed on the basis of the Award Criterion: Price, after which a new total score will be determined. TNO will award the Contract again based on this reassessment. This is to avoid what is referred to as the "ranking paradox".

6.1.1 Sub-award criterion: Price TP (Total Price)

To determine the sub-award criterion: Price TP (Total Price), TNO asks the Tenderer to use the Format for Price Sheet (also: Price Sheet) prepared by TNO (in MS Excel) according to Annex **A03** for its price proposal. This Price Sheet should be completed and appended to the Tender. The Tenderer should strictly follow the outline of the Price Sheet and complete it in full. If the Price Sheet has not been submitted in full and/or correctly or at all, TNO will declare the Tender invalid and exclude it from further participation in the Procurement Procedure. Changing the format and layout of the Price Sheet (Annex **A03**) will also invalidate the Tender.

The distribution of the maximum number of point scores to be achieved for TP is given in the table below:

Criterion	Max. points score
Price TP	**500**

When completing the Price Sheet, the following Minimum Requirements apply:

1) Prices and expenses should be stated in euros excluding VAT, and to two (2) decimal places;

2) Only the unit prices and fees included in the Price Sheet will be assessed and apply during the performance of the final Contract. Prices stated elsewhere in the Tender do not create any rights or obligations between TNO and the Tenderer during the performance of the final Contract;

3) The prices/rates listed in the Price Sheet are all-inclusive. This means that all the costs/services/obligations/etc. required for the performance of the Contract in accordance with the contract terms have been factored into the prices and rates. During the performance of the Contract, the Contractor shall not be entitled to any other and/or additional remuneration other than that in accordance with the Price Sheet;

4) The Price Sheet should include a price proposal on all the required items. Prices for the Options are for indication purposes only and will therefore not be part of Price TP. The Tenderer shall use the Price Sheet prepared by TNO unchanged;

5) The Tenderer is solely responsible for stating figures and adding them correctly;

6) The prices quoted by the Tenderer should be based on the Procurement Documents without reservations of any kind;

7) Specific Minimum Requirements or additional instructions relating to the Price Sheet are included in the "additional instructions" tab and are accepted by the Tenderer reservations of any kind;

8) The prices and rates quoted in the Tender shall apply in the event of final award on commencement of the Contract and shall be fixed for the duration of the Contract;

The value of the lowest Price TP is determined on the basis of the cumulative costs in the Price Sheet defined by TNO.

The Tenderer with the lowest Price TP, being the lowest total price calculation, will be awarded the full number of points, set by TNO at 500 points. For the remaining Tenderers, the number of points to be obtained will be determined on a pro rata basis, with points deducted from the maximum number of points to be obtained.

Total Points for Total Price TP are calculated according to the following formula:

$$\boldsymbol{Total\ Points = 500 - \{\frac{(I\ -\ LI)}{LI}\ x\ 500\}}$$

Where:

Number of points = number of points obtained for sub-award criterion Price TP
I = Tender with "Price TP"
LI = Tender with the lowest "Price TP"

If I ≥ 2 x LI, then zero (0) points are awarded for sub-award criterion Price TP.
The total score is rounded to whole points.

6.1.2 Sub-award criterion: Quality (QY)

Section 8, the Programme of Requirements and Preferences (hereinafter "PoR"), of the Procurement Guide describes the requirements to be met by the performance of the Contract.

The PoR also contains a number of preferences with regard to the quality of the requested service/supply. These preferences are set out in the form of a questionnaire. By filling in the preferences section and answering questions, Tenderers can differentiate themselves in terms of quality.
The Tenderer is asked to provide notes for each preference/question, answering the subject-matters listed in the questionnaire.

The Tenderer shall answer the open questions clearly, unambiguously and point by point.
When elaborating an answer for each open question, the Tenderer should respect the set maximum number of A4 pages (font size at least 10 points and line spacing at least 1.5). Tenderers should bear in mind, when elaborating the preferences, that said answers become part of the Contract and must therefore be capable of fulfilment by the Tenderer.

TNO bases the assessment of the answers on the set maximum per answer. This means that Annexes or references to them should not form part of the answer in order to "get round" the set maximum number of A4 pages in this way. However, illustrations, diagrams, organisational charts and sample reports can form part of the answer. Annexes should not form part of the answer and will not be included in the assessment. If the set maximum is exceeded, the excess number of A4 pages will not be included in the assessment. Any part of the elaborated answer that exceeds the maximum will not become part of the Contract.

The elaboration of the preferences will be assessed in absolute terms. It is therefore possible that more than one Tenderer has the same score for the relevant answer to the question asked. The answers to the questions and therefore the compliance with preferences should be structured in the manner and order as specified in Section 8 and can be submitted using the Tenderer's own A4 format, subject to the aforementioned requirements.

The distribution of the maximum number of points to be achieved for sub-sub-award criterion: Quality (QY) is shown in the table below.

Section 8 Sub-sub-award criterion: Quality	**Max. points**
Preference 8.8.1 Planning & Delivery	***100***
Preference 8.8.2 Warranty & Service	***80***
Preference 8.8.3 Innovation & Environment	***80***
Preference 8.8.4 Quality & Durability	***240***
Total	***500***

The assessment of the answers to the questions as posed under the preferences in the PoR is carried out in the manner described in Section 3.1. As stated in Section 3.1, the average of the individual scores determines the corresponding total score. The average is determined by first determining the score per assessor (percentage * maximum score) and then averaging that score across all assessors (individual scores summed/number of assessors).

Each percentage referred to in the table equals a percentage of the maximum score per preference.

Valuation	Score	Notes to valuation
No/poor answer	*0%*	*No answer given or answer is not good, i.e. it is not in accordance with TNO's (minimum) preference(s)*
Unsatisfactory answer	*20%*	*Answer is not complete (the preference is not fully elaborated), not sufficient, not satisfactory, i.e. it is not fully in line with TNO's preference(s)*
Satisfactory answer	*50%*	*Answer is sufficient, satisfactory, adequately reflects TNO's preference(s)*
Good answer	*85%*	*Answer is good, i.e. the answer accurately reflects TNO's preference(s)*
Very good answer	*100%*	*Answer is outstanding, i.e. the answer exceeds TNO's preference(es)*

The following questions will be considered when assessing compliance with the preferences:

- Is the answer specific, realistic, achievable, effective, complete and consistent?
- To what extent does the answer reflect TNO's situation and the Programme of Requirements and Preferences? Does the Tenderer address the requested elements, subject-matters and aspects as stated in the relevant preference/question and the Programme of Requirements and Preferences?

The assessment will be based on the overall impression given by the answer given. The preference does not involve separate assessment aspects or criteria.

6.2 Award of Contract

6.2.1 Notification of the Award Decision

All Tenderers will receive from TNO, expectedly on the date referred to in the schedule under Section 2.1, the notification of the final result of the assessment of the Tenders and the intended Award Decision.
In this notification of the Award Decision, TNO will indicate the Tenderer to which it intends to award the Contract, as well as, for unsuccessful Tenderers, reasons for their rejection.

6.2.2 Challenge

If a Tenderer disagrees with the Intention to Award as notified by TNO, it will be given the opportunity to challenge the Intention to Award within twenty (20) calendar days after the date of publication of the Intention to Award in the manner described in Section 2.4 of the Procurement Guide.

6.2.3 Final award

Once the standstill period has expired without summary proceedings having been instituted or, if summary proceedings have been instituted in a timely manner, the judgment in first instance does not oppose final award, TNO will contact the successful Tenderer as soon as possible to proceed with the award, except where a situation exists in which summary proceedings have been instituted in a timely manner. No final award will be made until the Contract has been validly signed by both Parties. If this is not the case, there is no question of TNO being bound in any way.

Digital Signature of Contract
To this end, TNO signs its Contracts using a so-called advanced digital signature tool, known as ValidSign. On receipt of the provisional award, the Tenderer is requested to provide the e-mail address and personal mobile phone number of the organisation's authorised signatory. The telephone number is needed to make the Contract legally binding (using SMS authentication).

On receipt of the final award, the Tenderer receives an e-mail containing a link to the documents to be digitally signed and clicks on "sign the documents" and is automatically redirected to ValidSign where the signature fields are visible. To sign, the Tenderer clicks "click to sign" and then "confirm". Once the documents have been digitally signed by the Tenderer and TNO, the Tenderer can download the digitally signed documents within a timeframe of thirty (30) days.

7 Assessment of supporting and other documents from intended beneficiary

7.1 Requesting supporting and other documents from intended beneficiary

The Tenderer to which TNO intends to award the Contract must submit the supporting documents for the ESPD and any other documents and/or data within seven (7) calendar days after the date of TNO's request.

The following supporting documents must be supplied to TNO by the Tenderer to which TNO intends to award the Contract within seven (7) calendar days after the date of the request:

- Certificate of Conduct for Procurement (not more than two years old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- Declaration of Payment Behaviour from the Dutch Tax and Customs Administration (not more than six months old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- Extract from trade register (not more than six months old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- ISO 9001 Certification or similar measures;
- ISO 14001 Certification or similar measures;
- Insurance policy or Declaration of Readiness as to insurance (Annex **B03**);
- If applicable: Declaration as to Reliance on Financial and Economic Standing of Third Party or Parties (Annex **B01**);
- If applicable: Declaration as to Reliance on Technical and Professional Competence of Third Party or Parties (Annex **B02**).

Certificate of Conduct

The Certificate of Conduct (GVA; Dutch: Gedragsverklaring Aanbesteden) is a statement from the Minister of Security and Justice. The GVA indicates that an investigation into the natural or legal person concerned has not resulted in any objections in connection with the application and tendering for public contracts, special sector contracts, concession agreements for public works and/or services or competitions. After a provisional award, the provisionally awarded tenderer(s) must submit a valid GVA as proof that the grounds for exclusion do not apply to them.

TNO will request the intended beneficiary to submit the supporting documents. TNO will assess the following aspects of these documents:

- ascertain whether supporting documents submitted by Tenderer are submitted in a timely manner
- assess whether all the supporting documents requested by TNO have been submitted and whether the supporting documents received are complete. The absence of all or part(s) of supporting documents and/or other data will result in exclusion if there is no rectifiable omission. Depending on the nature of any deficiency, TNO will assess whether, as a result of that deficiency in the supporting documents, the Tender is invalid after all and will be disregarded, or whether the deficiency is amenable to rectification. The offer of rectification is a discretionary power of TNO and not a (legally enforceable) obligation.
- assess whether the Tenderer demonstrates through the supporting documents submitted that it complies with what it has declared through its Tender.

If the supporting documents are not, not completely and/or not timely received, or if the supporting documents show that the information in the Tender is incorrect, the Tenderer will be excluded after all/the Tender will be disregarded after all. If this is the Tenderer with the lowest price, the score for the sub-award criterion on Price TP will be recalculated, after which a new ranking will be determined. If this was not the Tenderer with the lowest price, the ranking order will be maintained and the Contract will be provisionally awarded to the Tenderers ranked in order of succession.

TNO is also entitled to verify the Tender from the Tenderer to which it intends to award the Contract. If this verification shows that the Tender contains inaccuracies or cannot be fulfilled, the Tender will be disregarded after all. If this is the Tenderer with the lowest price, the score for the sub-award criterion on Price TP will be recalculated, after which a new ranking will be determined. If this was not the Tenderer with the lowest price, the ranking order will be maintained and the Contract will be provisionally awarded to the Tenderers ranked in order of succession.

7.2 Contract subject to condition precedent

If the Tenderer is unable to provide a copy of the policy, nor a satisfactory statement from the insurance company, within the timeframe referred to in the previous section, but has signed the Declaration of Readiness in accordance with Annex **B03** then TNO will notify the Tenderer after a positive outcome of the assessment of the other (supporting) documents and after the standstill period has expired without summary proceedings having been instituted or – where summary proceedings have been instituted within the standstill period – the relevant judgement shows that the Award Decision can be upheld, that TNO will enter into the Contract with the Tenderer subject to a condition precedent. This condition precedent implies that the Contract will only actually be entered into if, after a timeframe of seven (7) calendar days (see Section 7.1), the Tenderer provides TNO with a copy of the required insurance policy or a satisfactory statement from the insurance company showing that the Tenderer is insured as required in the Procurement Documents. The Contract will not be entered into until after receipt of either document. If the Tenderer is unable to provide the required insurance policy or a satisfactory statement from the insurance company within the set timeframe, the Contract will not come to fruition and TNO will retain the right to award the Contract to the Tenderer which would be ranked in first place after the number one which was eliminated in accordance with the assessment system.

8 Programme of Requirements and Preferences

TNO assesses the Tenders against the Programme of Requirements and Preferences. The Programme of Requirements and Preferences includes Minimum Requirements, Questions, Performance Requirements and Preferences. The Minimum Requirements must be met on penalty of invalidity at the time of submission of the Tender, the Performance Requirements only at the time of performance of the Contract and the Preferences must be worked out by Tenderers as part of the award of the Contract.

TNO has the right, but not the (legally enforceable) duty, to ask for clarification as regards meeting the Minimum Requirements and how the Tenderer expects to meet the Minimum Requirements.

As stated in Section 6.1.2 of this Procurement Guide, in addition to the Minimum Requirements and performance requirements, this PoR also contains a number of preferences as regards the quality of the service/supply. The preferences must be answered/elaborated upon by the Tenderer in the Tender in response to the qualitative sub-award criteria.

Any changes to the PoR that may occur during the performance of the Contract will be implemented in accordance with the conditions of the Contract. In this regard, TNO will ensure that no material amendment will be made to the Contract.

The objective and scope of the Contract (including this PoR) as well as a description of the current conditions have been described in Section 1.

8.1 Requirements for Tool string 1 – MDM-GT-03-S2

8.1.1 Base request - Tool String 1A

Table 2 Requirements for geophones and cabling in MDM-GT-03-S2 (Base Request)

Minimum requirements	Aspect	Requirement Description
8.1.1.1	Number	Five geophones at 200, 1500, 2100, 2250, and 2350 m along-hole depth.
8.1.1.2	Components	The provided geophones must be 3 component geophones
8.1.1.3	Bandwidth	The bandwidth of the provided geophones must be 15 - 500 Hz, suitable for recording microseismicity down to ~M -1.5
8.1.1.4	Logging rate	Signal should be such that it can be sampled at a logging rate of 500 Hz
8.1.1.5	Dynamic range	> 145 dB
8.1.1.6	Sensitivity	> 70 V/m/s
8.1.1.7	Resonance freq.	< 5 Hz
8.1.1.8	Max. diameter	The provided geophones must fit within the 13 3/8”, 9 5/8”, 7”, and 5 1/2” casings or liners, depending on the geophone depth. (see well completion diagram in section 1.1 of Annex C02)
8.1.1.9	Formation coupling	A good stabilization must be provided so the geophones do not rotate, and a good coupling must be provided between the geophones and the borehole casing (see chapter 1 of Annex C02), e.g. like anchoring the geophones to the borehole wall.
8.1.1.10	Removability & redeployability	The design of the tool string and coupling of the geophones to the borehole casing should be such that the string is removable and be able to be placed back in the well, e.g. in case of equipment failure or the obligatory well integrity logging (once every 5 years), without failure of the string.
8.1.1.11	Deviation	The provided geophones and cabling must be able to handle at least 33 degrees tilt of the wellbore (this is the deviation at the deepest part of the wellbore, see 1.3 of Annex C02)
8.1.1.12	Fluids	The provided geophones and cabling must be able to function in the fluid composition as found within MDM-GT-03-S2, for >5 years (see section 1.3 of Annex C02). Geophone seals should hold under these conditions, and the effect of potential dissolved gases and biocide on the geophone seals must be taken into account for the geophone design.
8.1.1.13	Temperature	The provided geophones and cabling must operate at least within the temperature range 0 - 80 degrees C
8.1.1.14	Pressure	The provided geophones and cabling must be able to withstand fluid pressures up to 25 MPa
8.1.1.15	Output	The provided geophones must output analog signals. Downhole digitization is not preferred.

8.1.1.16	Lifetime	Lifetime of the tool string in the well must be >5 years, preferable >10 years
8.1.1.17	Redundancy	High value is attached to redundancy. If one instrument fails, the other one should keep functioning.
8.1.1.18	Cabling	The cable/wireline on which the geophones are deployed must be strong and durable enough to last at least 5 years at the downhole pressures, temperatures and brine chemistry. The cable must be strong enough to maintain integrity during removal of the tool string for logging and subsequent redeployment, with an ample safety margin.
8.1.1.19	Feed-through	Supplier (or third party working for supplier) ensures feed-through port through the wellhead, in consultation with TNO and operator Ennatuurlijk Aardwarmte. See also Annex C02
8.1.1.20	Installation	Supplier (or third party working for supplier) installs the tool string in the well and ensure surface installation, in consultation with the operator Ennatuurlijk Aardwarmte. Supplier performs testing and calibration of the instruments.
8.1.1.21	Datasheet	Full datasheet of the geophones must be submitted by supplier

8.1.2 Extension 1 – Tool String 1B

Table 3 Requirements for (retrievable) plug in MDM-GT-03-S2 (Extension 1, Tool String 1B)

Minimum requirements	Aspect	Requirement Description
8.1.2.1	Characteristics	Plug at ~2429 m AH depth (= 2209 TVD m)
8.1.2.2	Pressure	The plug/packer should isolate the reservoir section below, and be able to withstand a differential pressure of 2.5 MPa with respect to the ambient pressure at 2209 m TVD (0.106 bar/m).
8.1.2.3	Max. diameter	The provided plug must fit within the 5 1/2” liner (see section 1.2 of Annex C02)
8.1.2.4	Removability	The plug should be removable and be able to be placed back in the well, e.g. in case of equipment failure or during the obligatory well integrity logging every 5 years.
8.1.2.5	Deviation	The provided plug must be able to be placed in a cased section tilting up to 33° from vertical (see 1.3 of Annex C02)
8.1.2.6	Fluids	The provided plug must be able to function in the fluid composition as found within MDM-GT-03-S2, for >5 years (see section 1.3 of Annex C02). The effect of potential dissolved gases and biocide on the plug must be taken into account.
8.1.2.7	Temperature	The provided plug must operate at least within the temperature range -5 to 95 degrees C
8.1.2.8	Compatibility	The plug should be compatible with the Tool String 1A, and allow through-put for pressure and temperature gauges below. It could either be installed disconnected from the Tool String, or be part of the tool string.
8.1.2.9	Lifetime	Lifetime must be >5 years, preferable >10 years
8.1.2.10	Deployment	Supplier arranges deployment of the plug.
8.1.2.11	Datasheet	Full datasheet of the pressure gauge must be submitted by supplier

Table 4 Requirements for temperature gauge in MDM-GT-03-S2 (Extension 1, Tool String extension 1B)

Minimum requirements	Aspect	Requirement Description
8.1.2.12	Number & depth	One pressure gauge in the reservoir interval (between 2480 – 2690 m AH depth, preferable in the middle of the reservoir)
8.1.2.13	Resolution	The gauge should be able to record pressure change to a resolution down to at least 0.05 MPa.
8.1.2.14	Max. diameter	The provided pressure gauge must fit within the 5 1/2” screens (see section 1.2 of Annex C02)
8.1.2.15	Removability	The pressure gauge should be removable and be able to be placed back in the well, e.g. in case of equipment failure or during the obligatory well integrity logging every 5 years.

8.1.2.16	Deviation	The provided pressure gauge must be able to handle at least 33° tilt at 1900 m depth (see 1.3 of Annex C02)
8.1.2.17	Fluids	The provided pressure gauge must be able to function in the fluid composition as found within MDM-GT-03-S2, for >5 years (see section 1.3 of Annex C02). The effect of potential dissolved gases and biocide on the instrument must be taken into account.
8.1.2.18	Temperature	The provided pressure gauge must operate at least within the temperature range 15 to 95 degrees C
8.1.2.19	Pressure	The provided pressure gauge must be able to withstand fluid pressures of at least 28 MPa
8.1.2.20	Compatibility	The temperature gauge should be compatible with Tool String 1A and the plug, which is located above the temperature gauge.
8.1.2.21	Output	The provided pressure gauge must preferably output analog signals, in (near-) real time.
8.1.2.22	Lifetime	Lifetime must be >5 years, preferable >10 years.
8.1.2.23	Datasheet	Full datasheet of the pressure gauge must be submitted by supplier.
8.1.2.24	Compatibility	The temperature gauge should be deployed beneath the plug of Table 3.

Table 5 Requirements for temperature gauge in MDM-GT-03-S2 (Extension 1, Tool String 1B)

Minimum requirements	Aspect	Requirement Description
8.1.2.25	Number & depth	One temperature gauge in the reservoir interval (between 2480 – 2690 m AH depth, preferable in the middle of the reservoir)
8.1.2.26	Resolution	The gauge should be able to record temperature changes to a resolution down to at least 0.05 °C.
8.1.2.27	Max. diameter	The provided temperature gauge must fit within the 5 1/2" screens (see section 1.2 of Annex C02)
8.1.2.28	Removability	The temperature gauge should be removable and be able to be placed back in the well, e.g. in case of equipment failure or during the obligatory well integrity logging every 5 years.
8.1.2.29	Deviation	The provided temperature gauge must be able to handle at least 40° tilt at 1900 m depth (see 1.3 of Annex C02)
8.1.2.30	Fluids	The provided temperature gauge must be able to function in the fluid composition as found within MDM-GT-03-S2, for >5 years (see section 1.3 of Annex C02). The effect of potential dissolved gases and biocide on the instrument must be taken into account.
8.1.2.31	Temperature	The provided temperature gauge must operate at least within the temperature range 15 to 95 degrees C
8.1.2.32	Pressure	The provided temperature gauge must be able to withstand fluid pressures of at least 28 MPa
8.1.2.33	Output	The provided temperature gauge must preferably output analog signals, in (near-) real time.
8.1.2.34	Lifetime	Lifetime must be >5 years, preferable >10 years
8.1.2.35	Datasheet	Full datasheet of the temperature gauge must be submitted by supplier
8.1.2.36	Compatibility	The temperature gauge should be deployed beneath the squeeze plug (Table 3)

8.1.3 Extension 2 – Tool String 1C with DAS/DTS cable and DAS interrogator

Table 6 Requirements for DAS interrogator at MDM-GT-03-S2 (Extension 2, Tool String 1C)

Minimum requirements	Aspect	Requirement Description
8.1.3.1	Measurements	The DAS interrogator is capable of conducting DAS measurements for the purpose of recording microseismicity.
8.1.3.2	Compatibility	The DAS interrogator must be compatible both with single-mode and multi-mode fiber optic cables.
8.1.3.3	Health	Interrogator includes a field computer with software that can control the recording parameters of the hardware and that allows a system health check.

8.1.3.4	System	The DAS interrogator must include all components that are required to make the system fully functional and operational.
8.1.3.5	Recording	The system is capable of recording passive seismic data continuously, including being able to time stamp the data.
8.1.3.6	Triggering	The system is capable of recording active seismic data by using an external trigger to start recordings. It should be able to accept a closure as wells as a TTL pulse as external trigger. The record length and sampling rate should be adjustable in the software.
8.1.3.7	GPS	A GPS receiver is part of the acquisition system for accurate time synchronization of the DAS data.
8.1.3.8	Cable length	The system allows acquisition of DAS measurements up to a fiber optic cable length of 50 km or more.
8.1.3.9	Frequency	The measurements should cover a frequency range of at least down to 0.1 Hz and up to at least 32 kHz.
8.1.3.10	Strain rate	The recording hardware (combination of interrogator with fibre-optic cable) is able to measure strain rate data equivalent to a seismic particle velocity down to 10-8 m/s.
8.1.3.11	Connection	The system allows remote data access via an ethernet connection.
8.1.3.12	Data storage	Data should also be transferrable by physically exchanging storage media.
8.1.3.13	Course	The system should be offered including an Introduction course for operating the delivered equipment.
8.1.3.14	Gauge length	The DAS interrogator must provide flexibility in gauge length ranging from 2m up to 30 meter.
8.1.3.15	Data format	Data should be stored or convertible in to a SEG-conform file format (e.g. SEGY), including relevant file headers.
8.1.3.16	Price	The total price should be below EUR 215.000 (in accordance with the EU threshold that are applied from 1 January 2022).
8.1.3.17	Price	The (total price of the) DAS interrogator includes Freight and shipping cost (DDP incoterms 2020) and Operating manuals.
8.1.3.18	Delivery	The DAS interrogator will be delivered with and placed in a flight cases to safely transport and store and protect all equipment.

Table 7 Requirements for DAS/DTS cable in MDM-GT-03-S2 (Extension 2, Tool String 1C)

Minimum requirements	Aspect	Requirement Description
8.1.3.19	Number of fibers	2 single mode fibers. At least 2 multimode fibers, preferably 4.
8.1.3.20	Temperature	The cable outer materials must protect the fibers up to a temperature of 85 degrees.
8.1.3.21	Pressure	The cable must be able to withstand fluid pressures of at least 25 MPa
8.1.3.22	Fluids	The provided cable must be able to function in the fluid composition as found within MDM-GT-03-S2, for >5 years (see section 1.3 of Annex C02). The effect of potential dissolved gases and biocide on the cable must be taken into account.
8.1.3.23	Lifetime	Lifetime must be >5 years, preferable >10 years
8.1.3.24	Datasheet	Full datasheet of the temperature gauge must be submitted by supplier
8.1.3.25	Compatibility	DAS cable should be combined with Tool string 1A in such a way both geophones and DAS cable remain functional.
8.1.3.26	Calibration & testing	Supplier ensures the fiber optic system is calibrated, and co-location points with geophones are known, prior to deployment.

Table 8 Questions for DAS/DTS cable in MDM-GT-03-S2 (Extension 2, Tool String 1C)

Question	Aspect	Requirement description
8.1.1	Compatibility	Include a description on how the fiber optic cable could be optimally combined with the geophone string (i.e. how Requirement 8.1.7.7 is fulfilled)
8.1.2	Coupling	Include a note on the feasibility of recording microseismic with a cable that is lying loose inside a cased (deviated) well.

8.2 Requirements for Tool String 2 – VDB-GT-01-S1 at Bleiswijk

Table 9 Requirements for geophones and cabling in VDB-GT-01-S1

Minimum requirements	Aspect	Requirement Description
8.2.1	Number	Two geophones at 30 and 350 m along-hole depth
8.2.2	Components	The provided geophones must be 3 component geophones
8.2.3	Bandwidth	The bandwidth of the provided geophones must be 15 - 500 Hz, suitable for recording microseismicity down to ~M -1.0
8.2.4	Logging rate	Signal should be such that it can be sampled at a logging rate of 500 Hz
8.2.5	Dynamic range	> 145 dB
8.2.6	Sensitivity	> 70 V/m/s
8.2.7	Resonance freq.	< 5 Hz
8.2.8	Max. diameter	The provided geophones must fit within the 9 5/8” liner (see section 2.1 of Annex C02)
8.2.9	Formation coupling	A good stabilization must be provided so the geophones do not rotate, and a good coupling must be provided between the geophones and the borehole casing (see chapter 1 of Annex C02), e.g. like anchoring the geophones to the borehole wall.
8.2.10	Removability	The mechanical coupling of the geophones to the borehole casing should be such that the string is removable at the end of the monitoring period.
8.2.11	Deviation	The provided geophones and cabling must be able to handle at least a few degrees of tilt of the wellbore (see chapter 2 of Annex C02)
8.2.12	Fluids	The provided geophones and cabling must be able to function in the fluid composition as found within VDB-GT-01-S1, for >5 years (see section 2.4 of Annex C02) – i.e. a brine of 1.06 sg. Geophone seals should hold under these conditions, and the effect of potential dissolved gases and biocide on the geophone seals must be taken into account for the geophone design.
8.2.13	Temperature	The provided geophones and cabling must operate at least within the temperature range -5 to 30 degrees C
8.2.14	Pressure	The provided geophones and cabling must be able to withstand fluid pressures of at least 5 MPa
8.2.15	Output	The provided geophones must output analog signals. Downhole digitization is not preferred.
8.2.16	Lifetime	Lifetime of geophones and cabling must be >5 years, preferable >10 years
8.2.17	Redundancy	High value is attached to redundancy. If one instrument fails, the other one should keep functioning.
8.2.18	Cabling	Cabling must be strong enough to hold geophones and its own weight, and to be pulled out of the wellbore at the end of the monitoring period.
8.2.19	Feed-through	Supplier (or third party working for supplier) ensures feed-through port through the wellhead if not already available, in consultation with operator GAIA Energy and TNO. See also Annex C02
8.2.19	Installation	Supplier (or third party working for supplier) installs the tool string in consultation with the operator GAIA Energy. Supplier performs testing and calibration of the instruments.
8.2.20	Datasheet	Full datasheet of the geophones must be submitted by supplier

8.3 Requirements for Tool String 3 – VDB-GT-03-S1

8.3.1 Base request - Tool String 3

Table 10 Requirements for geophones and cabling in VDB-GT-03-S1

Minimum requirements	Aspect	Requirement Description

8.3.1.1	Number	Two geophones at 490 and 700 m along-hole depth
8.3.1.2	Components	The provided geophones must be 3 component geophones
8.3.1.3	Bandwidth	The bandwidth of the provided geophones must be 15 - 500 Hz, suitable for recording microseismicity down to ~M -1.5
8.3.1.4	Logging rate	Signal should be such that it can be sampled at a logging rate of 500 Hz
8.3.1.5	Dynamic range	> 145 dB
8.3.1.6	Sensitivity	> 70 V/m/s
8.3.1.7	Resonance freq.	< 5 Hz
8.3.1.8	Max. diameter	The provided geophones must fit within the 9 5/8" casing (see section 2.1 of Annex C02)
8.3.1.9	Formation coupling	A good stabilization must be provided so the geophones do not rotate, and a good coupling must be provided between the geophones and the borehole casing (see chapter 1 of Annex C02), e.g. like anchoring the geophones to the borehole wall.
8.3.1.10	Removability	The design of the geophone tool string should be such that the string is removable at the end of the monitoring period.
8.3.1.11	Deviation	The provided geophones and cabling must be able to handle at least a few degrees of tilt of the wellbore (see chapter 2 of Annex C02)
8.3.1.12	Fluids	The provided geophones and cabling must be able to function in the fluid composition as found within VDB-GT-03-S1, for >5 years (see section 2.4 of Annex C02) – i.e. a brine of 1.06 sg. Geophone seals should hold under these conditions, and the effect of potential dissolved gases and biocide on the geophone seals must be taken into account for the geophone design.
8.3.1.13	Temperature	The provided geophones and cabling must operate at least within the temperature range -5 to 45 degrees C
8.3.1.14	Pressure	The provided geophones and cabling must be able to withstand fluid pressures of at least 10 MPa
8.3.1.15	Output	The provided geophones must output analog signals. Downhole digitization is not preferred.
8.3.1.16	Lifetime	Lifetime must be >5 years, preferable >10 years
8.3.1.17	Redundancy	High value is attached to redundancy. If one instrument fails, the other one(s) should keep functioning.
8.3.1.18	Cabling	Cabling must be strong and resilient enough to keep functioning under the fluid, temperature and pressure conditions specified above, and to be pulled out of the hole intact after prolonged periods of time.
8.3.1.19	Feed-through	Supplier (or third party working for supplier) ensures feed-through port through the wellhead, in consultation with operator GAIA Energy and TNO. See also Annex C02
8.3.1.20	Installation	Supplier (or third party working for supplier) installs the tool string in consultation with the operator GAIA Energy. Supplier performs testing and calibration of the instruments.
8.3.1.21	Datasheet	Full datasheet of the geophones must be submitted by supplier

8.3.2 Extension 3 – Tool String 3B with extra geophone

Table 11 Requirements for geophones and cabling in VDB-GT-04 (Tool String 4A)

Minimum requirements	Aspect	Requirement Description
8.3.2.1	Number	An extra geophone on string 3A at 200 m
8.3.2.2	Compatibility	Included on Tool String 3A, same Requirements for all other settings

8.4 Requirements for Tool String 4 - VDB-GT-04

8.4.1 Base request - Tool String 4

Table 12 Requirements for geophones and cabling in VDB-GT-04 (Tool String 4A)

Minimum requirements	Aspect	Requirement Description
8.4.1.1	Number	Two geophones at 750 and 1800 m along-hole (AH) depth
8.4.1.2	Components	The provided geophones must be 3 component geophones
8.4.1.3	Bandwidth	The bandwidth of the provided geophones must be 15 - 500 Hz, suitable for recording microseismicity down to ~M -1.5
8.4.1.4	Logging rate	Signal should be such that it can be sampled at a logging rate of 500 Hz
8.4.1.5	Dynamic range	> 145 dB
8.4.1.6	Sensitivity	> 70 V/m/s
8.4.1.7	Resonance freq.	< 5 Hz
8.4.1.8	Max. diameter	The provided geophones must fit within the 9 5/8” casing and 7” liner (see section 2.1 of Annex C02)
8.4.1.9	Formation coupling	A good stabilization must be provided so the geophones do not rotate, and a good coupling must be provided between the geophones and the borehole casing (see chapter 1 of Annex C02), e.g. like anchoring the geophones to the borehole wall.
8.4.1.10	Removability & redeployability	The design of the tool string and coupling of the geophones to the borehole casing should be such that the string is removable and be able to be placed back in the well, e.g. in case of equipment failure or the obligatory well integrity logging (once every 5 years), without failure of the string.
8.4.1.11	Deviation	The provided geophones and cabling must be able to handle at least 5° tilt of the wellbore at 750 m depth and at least 45° tilt at 1800 m AH depth (see chapter 2 of Annex C02)
8.4.1.12	Fluids	The provided geophones and cabling must be able to function in the fluid composition as found within VDB-GT-04, for >5 years (see section 2.4 of Annex C02). Geophone seals should hold under these conditions, and the effect of potential dissolved gases and biocide on the geophone seals must be taken into account for the geophone design.
8.4.1.13	Temperature	The provided geophones and cabling must operate at least within the temperature range -5 to 70 degrees C
8.4.1.14	Pressure	The provided geophones and cabling must be able to withstand fluid pressures of at least 20 MPa
8.4.1.15	Output	The provided geophones must output analog signals. Downhole digitization is not preferred.
8.4.1.16	Lifetime	Lifetime must be >5 years, preferable >10 years
8.4.1.17	Redundancy	High value is attached to redundancy. If one instrument fails, the others should keep functioning.
8.4.1.18	Cabling	Cabling must retain integrity and strength under the pressure and temperature conditions specified above. Cable must be strong enough to allow pulling out the tool string during mandatory logging operations, with a safe margin.
8.4.1.19	Feed-through	Supplier (or third party working for supplier) ensures feed-through port through the wellhead, in consultation with operator GAIA Energy and TNO. See also Annex C02
8.4.1.20	Installation	Supplier (or third party working for supplier) installs the tool string in consultation with the operator GAIA Energy and TNO. Supplier performs testing and calibration of the instruments.
8.4.1.21	Datasheet	Full datasheet of the geophones must be submitted by supplier

Table 13 Requirements for pressure gauge in VDB-GT-04 (Tool String 4A)

Minimum requirements	Aspect	Requirement Description
8.4.1.22	Number	One pressure gauge in the center of the reservoir interval
8.4.1.23	Resolution	The gauge should be able to record pressure change to a resolution down to at least 0.05 MPa or ≤0.05%.
8.4.1.24	Max. diameter	The provided pressure gauge must fit within the 5 1/2" screens (see section 2.1 of Annex C02)
8.4.1.25	Removability	The pressure gauge should be removable and be able to be placed back in the well, e.g. in case of equipment failure or during the obligatory well integrity logging every 5 years.
8.4.1.26	Deviation	The provided pressure gauge must be able to handle at least 45° tilt at 1900 m AH depth (see chapter 2 of Annex C02)
8.4.1.27	Fluids	The provided pressure gauge must be able to function in the fluid composition as found within VDB-GT-04, for >5 years (see section 2.4 of Annex C02). The effect of potential dissolved gases and biocide on the instrument must be taken into account.
8.4.1.28	Temperature	The provided pressure gauge must operate at least within the temperature range -5 to 85 degrees C
8.4.1.29	Pressure	The provided pressure gauge must be able to withstand fluid pressures of at least 25 MPa
8.4.1.30	Lifetime	Lifetime must be >5 years
8.4.1.31	Datasheet	Full datasheet of the pressure gauge must be submitted by supplier

Table 14 Requirements for temperature gauge in VDB-GT-04 (Tool String 4A)

Minimum requirements	Aspect	Requirement Description
8.4.1.32	Number	One temperature gauge in the reservoir
8.4.1.33	Resolution	The gauge should be able to record temperature changes to a resolution down to at least 0.05 °C.
8.4.1.34	Max. diameter	The provided temperature gauge must fit within the 5 1/2" screens (see section 2.1 of Annex C02)
8.4.1.35	Removability	The temperature gauge should be removable and be able to be placed back in the well, e.g. in case of equipment failure or during the obligatory well integrity logging every 5 years.
8.4.1.36	Deviation	The provided temperature gauge must be able to handle at least 45° tilt at 1900 m depth (see chapter 2 of Annex C02)
8.4.1.37	Fluids	The provided temperature gauge must be able to function in the fluid composition as found within VDB-GT-04, for >5 years (see section 2.4 of Annex C02). The effect of potential dissolved gases and biocide on the instrument must be taken into account.
8.4.1.38	Temperature	The provided temperature gauge must operate at least within the temperature range -5 to 85 degrees C
8.4.1.39	Pressure	The provided temperature gauge must be able to withstand fluid pressures of at least 25 MPa
8.4.1.40	Lifetime	Lifetime must be >5 years
8.4.1.41	Datasheet	Full datasheet of the temperature gauge must be submitted by supplier

8.4.2 Extension 4 – Tool String 4B with DAS/DTS

Table 15 Requirements for DAS/DTS cable in VDB-GT-04 (Tool String 4B, Extension 4)

Minimum requirements	Aspect	Requirement Description
8.4.2.1	Number of fibers	2 single mode fibers At least 4 multimode fibers

8.4.2.2	Temperature	The cable outer materials must protect the fibers up to a temperature of 70 degrees.
8.4.2.3	Pressure	The cable must be able to withstand fluid pressures of at least 20 MPa
8.4.2.4	Fluids	The provided cable must be able to function in the fluid composition as found within VDB-GT-04, for >5 years (see section 2.4 of Annex C02). The effect of potential dissolved gases and biocide on the cable must be taken into account.
8.4.2.5	Lifetime	Lifetime must be >5 years, preferable >10 years
8.4.2.6	Compatibility	The cable must be compatible with tool string 4 of the Base Request, with both the geophones and the fiber optic cable functioning.
8.4.2.7	Datasheet	Full datasheet of the temperature gauge must be submitted by supplier

Table 16 Requirements for DTS interrogator and DTS system in VDB-GT-04 (Tool String 4B)

Minimum requirements	Aspect	Requirement Description
8.4.2.8	General	The DTS interrogator can acquire DTS measurements along fiber optic cables
8.4.2.9	Compatibility	The DTS interrogator must be compatible both with single-mode and multi-mode fibers
8.4.2.10	General	A field computer with software that can control the recording parameters of the hardware and that allows a system health check
8.4.2.11	General	The DTS interrogator must include all components that are required to make the system fully functional and operational.
8.4.2.12	General	The system is capable of recording continuously, including being able to time stamp the data.
8.4.2.13	Sampling rate	The sampling rate should be adjustable in the software. A maximum pulse repetition rate of at least 5kHz for a distance of fiber of 10 km.
8.4.2.14	GPS	A GPS receiver is part of the acquisition system for accurate time synchronization the recorded DTS data
8.4.2.15	Sampling length	The system allows acquisition of DTS measurements along optical fibers with a length up to 10 km or more
8.4.2.16	General	The measurements should cover a frequency range of
8.4.2.17	General	The DTS interrogator must be based on Raman scattering
8.4.2.18	Temperature resolution	The DTS interrogator combined with an fiber optic cable (Table 15) form a DTS system that has the potential to measure temperature with a resolution of less than 1.0 degree at a distance up to 6 km along the fiber.
8.4.2.19	Temporal resolution	The DTS system can achieve a temporal resolution as high as 1 second.
8.4.2.20	Spatial resolution	The DTS system can reach a spatial resolution as high as 1 meter.
8.4.2.21	Accuracy	The DTS system has the potential to provide a temperature accuracy up to 0.1 degrees, and at least less than 1 degree.
8.4.2.22	Connectivity	The system allows remote data access via an ethernet connection
8.4.2.23	Data transfer	Data should be also transferrable by physically exchanging storage media
8.4.2.24	Gauge length	The DTS interrogator must provide flexibility in gauge length
8.4.2.25	Averaging	The DTS interrogator must provide flexibility in the parameters for time-domain averaging and for space-domain averaging.
8.4.2.26	Power	Connect to power point in consultation with operator GAIA. Ensure backup power in case of power outage.
8.4.2.27	Installation	Supplier helps set up the fiber optic monitoring system.

8.4.3 Extension 5 – Tool String 4C with additional geophones

Table 17 Requirements for geophones in VDB-GT-04 (Extension 5, Tool String 4C). A number of additional geophones is specified, other specifications are the same as in Table 12.

Minimum requirements	Aspect	Requirement Description
8.4.3.1	Number	Three additional geophones on Tool string 4 at 1000, 1300 and 1600 m along-hole depth
8.4.3.2	Dimension	The 1000, 1300 m and 1600 m geophones must fit in the 7” liner

8.5 Requirements for deployment, testing, maintenance for each of the four tool strings

For each tool string, the following requirements with respect to deployment are requested.

Table 18 Requirements for deployment, testing, maintenance for Tool string 1, 2, 3, and 4

Minimum requirements	Aspect	Requirement Description
8.5.1	Coordination	Supplier consults with TNO and operators on the tool string design and actions for deployment
8.5.2	Deployment	Supplier handles deployment and installation of the tool strings in the wells, as well as the design of the surface infrastructure required for a working setup, e.g. the suspension of the tool strings, connection to the dataloggers, etc..
8.5.3	Testing	After installation, supplier checks all components of the tool string and ensures the tool string is fully functional
8.5.4	Calibration	Supplier handles any required calibration of instruments on the tool strings. Supplier determines the orientation of geophones where needed.
8.5.5	Maintenance	Supplier handles maintenance of the tool strings and surface equipment for 3 years from the installation.
8.5.6	Wellhead	Supplier arranges for providing feedthrough through wellhead in consultation with operator, allowing the cable of the tool strings to pass through the wellhead (see chapter 2 of Annex C02).

8.6 Requirements for datalogger and station design for each of the four tool strings

Dataloggers and surface installation equipment is requested for all tool strings (= four tool strings at four locations). There can be one or more dataloggers per site, depending on the number of channels required. The requirements for the datalogger are summarized in the table below.

Table 19 Requirements for dataloggers for Tool strings 1, 2, 3, and 4

Minimum requirements	Aspect	Requirement Description
8.6.1	Sampling	Simultaneous sampling in time over all channels
8.6.2	Resolution	Resolution of at least 24 bit at 200 samples/second
8.6.3	Format	Continuous acquisition supporting MiniSeed
8.6.4	Datastream	Continuous datastream (seismic and state of health) conform SeedLink protocol
8.6.5	Backfill	Automatic data backfill in case of communication failure
8.6.6	Resolution in time	Precision in time less than 5 µs through internal GNSS antenna or external antenna

8.6.7	Dimension	Maximum dimension 30 x 30 x 20 cm (length x width x height)
8.6.8	Storage	Internal storage of at least 8 GB
8.6.9	Internet	Supports (incidental) data transfer over the internet
8.6.10	Remote control	Can be controlled or read out remotely, in combination with sensor, for diagnostics, configuration, testing and calibrations
8.6.11	Temperature	Operating temperature at least within -20 °C to 60 °C
8.6.12	Cabling	Internal and/or external cabling of IP67 or higher
8.6.13	Compatibility	Compatible with the geophones or other instruments on the tool string
8.6.14	Specification sheet	Full specification sheet delivered with geophone. Contains at least the instrument response as measured in the factory and the instrument noise curves.

Table 20 Requirements for data recording units for Tool strings 1, 2, 3, and 4

Minimum requirements	Aspect	Requirement Description
8.6.15	Remote control	Remote power control unit is present (EPC or comparable)
8.6.16	Internet	Internet connection is present, with a Vodafone modem (compatible with integration into the KNMI network), or in case of no Vodafone coverage, another provider in consultation with TNO.
8.6.17	Lightning	Protection against lightning Is present
8.6.18	Protection	Residual-current operated circuit breaker is present
8.6.19	Monitoring	It is possible to monitor remotely the health of the instruments, including error codes in case of instrument failures.

Table 21 Requirements for surface installation for Tool strings 1, 2, 3, and 4

Minimum requirements	Aspect	Requirement Description
8.6.20	Cabinet	Provide electricity cabinet
8.6.21	Electricity	Provide reliable power supply, in consultation with operator at each site. A power connection is available.
8.6.22	Station floor:	Place electricity cabinet on suitable substrate, e.g. a small concrete slab, in consultation with the operator.

8.7 General Requirements

Minimum requirements	Aspect	Requirement description

8.7.1	Extensions	The suppliers must at least be able to design, deliver and deploy the items in the Base Request, and be able to design, deliver, and deploy Extension 2, 3, 4, and 5.
8.7.2	Compatibility	Any Extension should be compatible with the Base Request.
8.7.3	Warranty	Warranty and service should be transferable to a new future owner of the tool strings.
8.7.4	Warranty	Warranty should include all hardware components and the costs needed to demobilize and redeploy the tool strings in case of failure or necessary repairs.
8.7.5	Code of Conduct	TNO expects its suppliers to endorse the TNO Supplier Code of Conduct (Annex C04). Therefore, Tenderers must also endorse these.
8.7.6	Documentation	The tool strings shall be delivered with all relevant documentation. This documentation must include at least the following: • Installation documentation • Design Package • List of components/equipment • Instruction manuals of the components and equipment where applicable • Maintenance manual including all required technical documentation for Preventive and Corrective Maintenance of the components and equipment where applicable. • Certificates and manuals of all third-party hardware that is part of the system. All the documents should be delivered digitally in English.
8.7.7	Delivery	TNO expects its suppliers to at least deliver fully functional monitoring systems (from design to final testing and calibration) no later than week 18 2026.

8.8 Programme of Preferences

Preferences overall	Aspect		Max Points
8.8.1	Planning & Delivery	TNO attaches great value to a shorter delivery time than the required maximum mentioned in requirement 8.7.7. For design, delivery and deployment (including testing and calibration) following the date of confirmation of the contract, the following scores will be awarded for: • Before week 52 2025: 100 points • Between week 1 and 5 2026: 75 points • Between week 6 and 11 2026: 50 points • Between week 12 and 17 2026: 25 points • In week 18 2026: 0 points	100

Preferences overall	Aspect		Max Points
8.8.2	Warranty & Service Max. 2 pages A4	TNO is looking for innovative, yet economical ideas on the topic Warranty and Service, whereby the focus will be on the length and cost of the Warranty and Service beyond the standard as mentioned in the General Purchasing Conditions of TNO, as well as what is covered by the warranty. Specify the **duration of the warranty**. Longer warranty periods will be rated higher than shorter warranty periods. Also address the following aspects: - Repair of instruments - Demobilization and redeploy - Service - Lifetime The assessment will be based on the overall impression given by the answer given. The preference does not involve separate assessment aspects or criteria. The complete answer for Preference 8.9.2 must not exceed **a maximum of 2 pages A4**. If the answer is longer than 2 pages, the excess pages will not be included in the assessment.	80
8.8.3	Innovation & Environment	TNO is looking for innovative, yet economical ideas on the topic Innovation and Environment, whereby the focus will be on the measures the Tenderer has on Environmental awareness and on providing innovative yet durable and economic design. Suggestions for different string design or extra sensors at similar cost which will benefit the research question of the project may also be supplied. Suggestions on the wellbore fluid composition are also welcome; in consultation with the operator certain additives to the wellbore fluids can be proposed which would benefit the lifetime of the instruments. Suggestion for alternative coupling mechanisms are welcome. Any innovative component or approach should fulfil the requirements specified in the relevant section of this tender. The assessment will be based on the overall impression given by the answer given. The preference does not involve separate assessment aspects or criteria. The complete answer for Preference 8.9.3 must not exceed **a maximum of 2 pages A4**. If the answer is longer than 2 pages, the excess pages will not be included in the assessment.	80

Preferences overall	Aspect		Max Points
8.8.4	Quality & Durability	High value is attached to having durable and robust tool strings, which are not prone to failure during installation, the monitoring period itself, and potential re-deployment after several years (Requirement 8.1.1.10 Removability & Redeployability). Hence TNO seeks innovative, yet economical ideas on proving and enhancing the durability of the system and avoidance of cabling and equipment failure, and any prior experience that can act as a proof of concept. Specify the quality of the instruments, where measuring capabilities of instruments far exceeding those of the requirements will be rated higher than capabilities closer to the requirements. Also specify the expected instrument degradation of the instruments over time. Less degradation is rated higher than more degradation. Designs with as little downhole digitization or vulnerable downhole mechanics as possible are preferred. Specify the clamping or coupling mechanism, and how this does or does not pose a risk of getting stuck when deploying the tool or lifting the tool string out of the well. Less downhole digitization or vulnerable downhole mechanics and less risk of getting stuck is rated better than a higher risk of mechanical failure, or getting stuck. Specify how to avoid the risk of getting stuck at liner-hanger sections. Again, a reduced risk will be rated better than more risk. Designs which use a single cable, or cabling that is not prone to tangling are preferred and rated better. Specify the cabling and any connections that are used to tie cabling together, if applicable. Elaborate on the strength of the cabling and the safety margin, and the expected degradation over time. More strength and better safety margins are rated better. Explain how the seals of the instruments and the cabling are suitable to survive in the wellbore fluids for prolonged amounts of time without leakage or degradation. A better substantiated sealing design is rated better than designs with higher risk of leakage or degradation. Specify what maintenance would need to be performed or what parts would need replacement before redeploying after 5 years. Less maintenance is rated better. Specify any prior experiences with the proposed tool string design. The assessment will be based on the overall impression given by the answer given. The preference does not involve separate assessment aspects or criteria. The complete answer for Preference 8.9.4 must not exceed **a maximum of 4 pages A4**. If the answer is longer than 4 pages, the excess pages will not be included in the assessment.	240

9 List of Annexes

All the Annexes appended to the Procurement Documents are published with the Procurement Guide at www.TenderNed.nl.

The Annexes are divided into three (3) main groups, namely:

A) Submission of Tender:

Annex A01	European Single Procurement Document (ESPD) – Self declaration by Tenderer - The Tenderer's ESPD ○ *If applicable, this format should be multiplied in proportion to the number individual Combination members; the individual Third Party or for the benefit of one or more subcontractors to be used for the work).*
Annex A02	Format for Reference Projects
Annex A03	Format for Price Sheet
Annex A04	Compliance to Requirements - Answers to Preferences (two tab sheets)

B) Submission of supporting documents:

Annex B01	Declaration as to Reliance on Financial and Economic Standing of Third Party or Parties
Annex B02	Declaration as to Reliance on Technical and Professional Competence of Third Party or Parties
Annex B03	Declaration as to Insurance Policy

C) Additional information:

Annex C01	Standard Template for Tenderer Questions
Annex C02	Background information
Annex C03	General Purchasing Conditions of TNO, February 2022.
Annex C04	TNO Supplier Code of Conduct, 2024

Additional note on Section 2.2.2 Formats
Some of these Annexes are accessible in "editable" MS Excel or MS Word versions. This is with the aim of simplifying the preparation of a Tender by the Tenderer and therefore also forms the basis for the assessment procedure as described in Section 3.
Some documents may be, partially, secured to prevent inadvertent and unintentional changes being made to the documents and texts (including format texts).

Changes to the formats are not permitted. The premise for these documents is that the text (including format text) as contained in the Procurement Guide and published on www.TenderNed.nl will be the authoritative text at all times.