Guide 7: Writing Support for Impact Projects (SIPs)

EURAMET MSU, Hampton Road, Teddington, Middlesex, TW11 0LW, UK
Phone: +44 20 8943 6666 Email: msu@npl.co.uk
msu.euramet.org

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If you require further help or guidance after reading this document, please contact the helpdesk

Email: msu@npl.co.uk

Telephone: +44 20 8943 6666.

1 Scope

This document explains how to write a Support for Impact Project (SIP) proposal for an EMPIR Call. It includes information on how to complete the templates and submit your proposal, and examples to help you write your proposal.

It does not include information on:

- eligibility, this is described in Guide 1: Admissibility and Eligibility for EMPIR Calls
- resourcing and costing a proposal, this is described in Guide 5: Submitting Administrative Data for EMPIR Projects
- evaluating a proposal, this is described in Guide 6: Evaluating EMPIR projects

2 Background

"Support for Impact" actions are coordination and support actions. Research and development activities are **not** eligible to be funded in SIPs, instead SIPs have a clear focus on dissemination and exploitation activities.

SIPs must be based on research outputs from a completed iMERA-Plus, EMRP or EMPIR Joint Research Project – i.e. the **Related JRP**.

A key requirement for a SIP is an external request for the work from an organisation ready to take up the outputs of the project and move them on to impact outside the metrology community. The organisation making this request is called the **Primary Supporter**. Without a Primary Supporter (i.e. a willing recipient expressing support for the proposal and identifying the actions they will take with the outputs of the project), the proposal would have no evidence of the route to impact and should not be funded.

The Primary Supporter is likely to be an organisation amongst the target user community of the Related JRP's outputs. They may be an organisation with which the Related JRP has had direct interactions, such as the project's non-NMI/DI partners, collaborators and stakeholders, advisory board members etc (particularly those in industrial and other end-user communities).

EURAMET recommends that the Primary Supporter writes section A4 of the SIP protocol, ensuring it is consistent with any letter of support they provide, and considers joining the consortium as an Unfunded Partner.

3 Submission

You should submit your SIP proposal electronically via the Call webpages https://msu.euramet.org/calls.html before the Call deadline. For each complete proposal, the following documents must be combined as a single ZIP file and submitted:

1. Template 7: SIP protocol (required)
2. Template 5: Project Administrative Data (required)
3. Letters of support (optional). These should be collated together as a single unsecured pdf file. Please note that letters of support submitted in an unsuitable format will not be provided to the referees by EURAMET.

*** While a letter of support from the Primary Supporter is not a formal eligibility requirement, their expressed need sets the context for the evaluation of the proposal. Therefore, a letter from the Primary Supporter explaining that need and the support they will offer the project to meet that need is very important information for the referees.*

This document includes size limits for some sections of your SIP proposal, the referees will be instructed to ignore any text over these limits.

If you wish to make corrections or amendments, you should resubmit a complete set of documents as a new ZIP file via the online submission system, indicating the original submission reference number.

Proposers should note that no other documents should be submitted, and any that are, will not be passed to the referees by EURAMET.

4 Participants

An individual “Support for Impact” project can have from one up to five project participants.

SIPs may include four types of project participant

1. Internal Funded Partner(s)
2. External Funded Partner(s)
3. Unfunded Partner(s)
4. And rarely, Linked Third Parties

If you think you will need to include a Linked Third Party, please email msu@npl.co.uk or contact the EURAMET Management Support Unit (MSU) for advice.

The eligibility criteria for each type of participant are described in Guide 1: Admissibility and Eligibility for EMPIR Calls. EURAMET will also make further checks to establish eligibility prior to issuing contracts.

5 Completing the SIP protocol

All sections of Template 7: SIP protocol, are mandatory, unless otherwise stated, and should be completed as detailed in the sections below.

The page limits given for a section MUST be adhered to using Arial font size 10. If the page limits are exceeded (for a section) then referees will be asked to disregard the text/information that is over the page limit. The mandatory page limits are summarised in the table below:

Section or sub-section	Maximum length
A3: Relevant outputs of the related JRP	300 words
B1.a: Summary of the project	1.5 pages
B2.a: Impact	2 pages
B2.b: Data management	1 page
B3.a: Overview of the consortium	1 page

5.1 Title page

Please complete and remove the <>, and ensure that the data is consistent with that in Template 5: Project Administrative Data.

The number after the SIP must be the same as the number from the related iMERA-Plus or EMRP JRP (e.g. SIP-T1.J1.1 or SIP-ENG09). The short name should summarise the full title and/or reflect the proposal (a maximum of 13 characters including spaces) and you should ensure that the proposed short name is consistent between Template 4 and Template 5: Project Administrative Data.

The full title should reflect the impact of the proposal such as:

example 1. Standards and software to maximise end user uptake of NMI calibrations of dynamic force, torque and pressure sensors

example 2. Technical Specifications for quadrupole mass spectrometers and outgassing rates for assessing the quality of vacuum environments

example 3. Field trial of traceable online measurements of siloxanes in landfill gases

If your proposal is selected for funding it will be issued with a new SIP number and you may revise the title during contract negotiations (if required).

Please do **not** delete the automatic footers from Template 7: SIP protocol.

5.2 Glossary

A Glossary is optional and, if required, should be included before the table of contents.

5.3 Section A: Key data

5.3.1 Section A1: Project data summary and Section A2: Financial summary

In order to help proposers capture the necessary data, reduce duplication of data, and minimise errors, EURAMET have created Template 5: Project Administrative Data (an Excel workbook). The data entered in Template 5 automatically populates a number of worksheets containing tables that you should copy and paste into Section A1 and Section A2 in Template 7: SIP protocol.

Pasting tables from Template 5 into Section A1 and Section A2 in Template 7: SIP protocol		
Template 5 Worksheet	**Template 7: SIP protocol Section A tables**	**Notes**
A	Section A1 Coordinator contact details	Select the right hand column inside the table and copy. Ctrl V or Paste Special as “Formatted Text”. Do not paste as “Picture”
A	Section A1 Primary supporter contact details	Select the right hand column inside the table and copy. Ctrl V or Paste Special as “Formatted Text”. Do not paste as “Picture”
B	Section A1 Participant details	Select the area inside the table and copy (excluding the column and row headings). Ctrl V or Paste Special as “Formatted Text”. Do not paste as “Picture” Please delete any empty rows in the tables. If your project does not include Linked Third Parties then “table b. Linked Third Parties” should be deleted.
C	Section A2 Financial summary	Select the area inside the table and copy (excluding the column and row headings). Ctrl V or Paste Special as “Formatted Text” those cells that include data. Do not paste as “Picture” or repaste the column or row headings. If your proposal includes any subcontracting, include one or two sentences under the A2 table explaining what will be subcontracted and why.

If your project includes a Linked Third Party you must include the following sentence under the Financial summary table “Some of the staff working on the project at YYY are employed by the Linked Third Party NNN. NNN will provide N months of labour resource overall to this project in WPX, WPY and WPZ. This resource is included in the table above.” and you must identify the number of person months the Linked Third Party will provide to each WP.

5.3.2 Section A3: Relevant outputs of the related JRP

Section A3 should present a brief overview of the related JRP and the **outputs that are relevant to the proposed SIP**. The overview should not be longer than 300 words and the outputs of the related JRP should be presented in bullet points and named accordingly (e.g. Output 1, Output 2 etc.).

Example: A3 Relevant outputs of related JRP

Overview
Historically, vacuum has been an important tool in industry and has been used in many applications, ranging from protecting light filaments from chemical degradation to controlling the flow of current in electronics. The use of vacuum is still important today, in modern lighting, the semiconductor industry and fusion power research. However, vacuum is poorly understood when used outside the laboratory, as traditional measurements are unsuitable and based on the pressures of pure gases in stable conditions. This project improved vacuum measurements in conditions representative of those found in industry. The improved measurements will lead to a more efficient use of vacuum and better end products.

Output 1: JRP IND88 prepared guidelines on how to characterise and calibrate quadrupole mass spectrometers (QMS) for vacuum measurement

Output 2: JRP IND88 successfully performed traceable outgassing rate measurements

5.3.3 Section A4: Primary supporter's request/need for this project

This section should clearly state the external need for the project based on the requirement specified by the primary supporter and the related JRP outputs it is based upon. It should demonstrate how the primary supporter will make use of the related JRP outputs (Output 1, Output 2 etc.) and move them outside of the metrology community.

Example: A4 Primary supporter's request/need for this project

Need related to Output 1: The ISO Technical Committee 112 "Vacuum Technology", the primary supporter of this SIP, has requested that these results from JRP IND88 should be implemented into Technical Specifications so that a wider community can use the results from the project and so that the necessary steps are taken to improve the traceability of partial pressure and outgassing rate measurements in industry.

Need related to Output 2: Outgassing rate measurements, which were, in the past, mainly performed by scientists in order to achieve very low pressures in vacuum systems, nowadays have great importance in industry. The results obtained within JRP IND88 identified suitable traceable and validated methods for outgassing rate measurements for use by such industries, however in order to support comparability between outgassing rate measurement systems, using different methods, standardisation is required.

5.4 Section B: Overview

Section B should be used to explain how your project addresses each of the 3 evaluation criteria ("Excellence", "Impact" and "Quality and Efficiency of the Implementation"). Proposers should therefore take note of the evaluation criteria (see Section 6.1).

Please do not include any photographs in Section B. Diagrams should only be included if absolutely necessary and should be limited to one or two schematic diagrams. In addition, do not include lists of references in Section B. Lists of references should only be included in Sections E and F, as appropriate (see Sections 5.12 and 5.13).

5.5 Section B1: Excellence

5.5.1 Section B1.a: Summary of the project

Section B.1.a should be aimed at a non-specialist audience. It should be no longer than 1.5 pages in length and a numbered list is recommended for summarising the SIP objectives and activities.

For a SIP, excellence is assessed in terms of excellence in the delivery of impact. Therefore this section should clearly present a summary of the complete project: the related JRP output(s) it is based upon, the need for the project, the SIP objectives and deliverables, the activities that will lead to impact and the impacts it will generate. The impact will be described in more detail in the following section (B2).

The summary should clearly state the external need for the project based on the requirement specified by the primary supporter and the related JRP outputs that are relevant to addressing the need. The related JRP reference number and short name (e.g. JRP ENG09 Biofuels) should be clearly stated in the summary along with a brief description of the specific research output that the SIP will use. The summary should also explain how the SIP objectives and activities will meet the specified need and how meeting this need will lead to direct impact for the primary supporter (and if applicable, other supporters) and how this will contribute to wider economic and/or social impact.

Where impact is related to European Legislation (Directives and / or Regulations) or documentary standards these should be fully referenced. You should also reference other published documents that identify or demonstrate the user need in this area (e.g. published technology roadmaps, published reports, documentary standards, codes of practice and external studies).

Please note that a preliminary Publishable JRP Summary will be required for successful proposals and EURAMET will use text from this section for that purpose. You should therefore exclude any confidential material from this section.

Example 1: B1.a Summary of the project

Overview
The aim of this project is to maximise uptake by industry end users and the Joint Committee for Guides in Metrology (JCGM) of outputs of EMRP JRP IND99 DYNA by providing concrete, specific and directed advice on how to make best use of the results of dynamic calibrations provided by NMIs.

The project's primary supporter is XXX who recognises that dynamic measurements are a key problem for high-value manufacturing. XXX will provide data from measurements of unsteady pressure and vibration for the SIP project team to demonstrate the methods developed in EMRP JRP IND99 in action.

Need
Many applications of the measurement of quantities such as force, torque and pressure are dynamic, i.e. the measurand shows a strong variation over time. Transducers are in most cases calibrated by static procedures owing to a lack of commonly accepted procedures or documentary standards for the dynamic calibration of mechanical sensors. However, it is well known that mechanical sensors exhibit distinctive dynamic behaviour that shows an increasing deviation from static sensitivity characteristics as frequency increases. This lack of dynamic calibration standards also applies to the electrical conditioning components of the measurement chain.

Previously, JRP IND99 DYNA sought to establish metrological traceability for the mechanical quantities; dynamic force, torque and pressure. The key output of JRP IND99 DYNA was the establishment of primary and secondary NMI-level traceability for the mechanical quantities; dynamic force, dynamic torque and dynamic pressure. However effective dissemination of dynamic calibrations requires specific advice to be provided to industrial end users on how to use calibration results to correct measurements for dynamic effects and to demonstrate compliance with the Guide to the Expression of Uncertainty in Measurement (GUM). Although JRP IND99 (i) developed general dynamic models for the complete calibration measurement chain, (ii) developed procedures for uncertainty evaluation in line with uncertainty evaluation for static measurements, and (iii) established general procedures for correcting measurements for dynamic effects, these were not able to be embodied in documentary standards and international guidance documents or in software that can be used in industrial applications to correct measurements and provide GUM-compliant uncertainty evaluations, during the lifetime of the project.

Calibration certificates and associated information provided for dynamic quantities by NMIs and accredited calibration laboratories can take several forms, such as parameterised models of the sensors and measuring systems that are calibrated, or frequency response data that describes the amplitude and phase response of the calibrated system as a function of frequency. In addition, sensors alone may be calibrated, so that the end user has to understand how the remainder of the measuring system (amplifiers, filters, digital acquisition systems) affects the performance of the calibrated system. The calibration methods may also be based on a variety of input signals, sine waves, chirps, steps and impulses, and the choice of signal determines what calibration information may be obtainable and how it may be used. Therefore, industrial end users require (i) guidance on what calibration information to request from NMIs and accredited calibration laboratories, (ii) guidance on how to use this information in their own dynamic measurement applications to ensure compliance with the GUM, and (iii) software that demonstrates the guidance in action.

Objectives
The specific technical objectives of this project are concerned with providing detailed practical guidance in measurement uncertainty evaluation for industrial end users of the outputs from JRP IND99 DYNA:

1. To provide written advice and guidance to end users, that demonstrates (by means of case studies applied to end user data) methods to evaluate reliable estimates of dynamic mechanical quantities and their associated uncertainties, taking into account the various forms that calibration results may take as well as correlation effects.
2. To make publicly available, validated and tested software for industrial end users to implement the methods described in point 1 above.

Activities
This project will undertake two activities, one associated with each of the project's objectives.

1. The preparation of input to JCGM Document 103 on building and using measurement models and to Document 110 giving examples of uncertainty evaluations in metrology including examples of uncertainty evaluations in metrology in industrial settings and typical end-user data. Both JCGM documents are currently in the early stages of preparation.
2. The production, validation and testing of software that demonstrates the methods developed in JRP IND99 in action on end user data as well as the production of case study material for inclusion in the publications/contributions in the first activity. The software will be made available for public download, therefore marketing and end user awareness activities will be undertaken, by means of targeted end user emails and the use of the BBB and AAA public web sites to advertise the software.

These activities align directly with identified end user needs, who require specific guidance on how to apply the outputs of JRP IND99; to their own measurements of dynamic effects in engines and to their selection of suitable sensors so as to establish confidence in their measurement results; to be able to show that they comply with best practice in uncertainty evaluation in accordance with the GUM; and to understand how the deconvolution and correction algorithms needed for this purpose can be embodied in validated software.

Impact
Direct impact will be achieved by this project by ensuring the widest possible uptake of the outputs of the mathematics and statistics work from JRP IND99 DYNA. This will be done by via a written contribution to JCGM Document 103 and Document 110 and an article in a suitable trade journal, which demonstrate the methods developed in JRP IND99 in action, on typical end user data provided by key industrial stakeholders.

The project will also create impact by enabling efficient application of the methods developed in JRP IND99 by disseminating software, that demonstrate the methods in action on industrially relevant example data, to industry end users and through the public websites of AAA and BBB.

In the longer term the outputs of the project will assist high-value manufacturing in the optimisation of products and processes where dynamic measurements are necessary. To quote the project's primary supporter XXX, "As companies strive to reduce margins even further to optimise performance, costs and reliability, it becomes more important to quantify the uncertainties involved rigorously and to be able to demonstrate metrological traceability of the resulting data."

Example 2: B1.a Summary of the project

Overview
The purpose of this SIP is to develop two Technical Specifications at the ISO level; the first Technical Specification is on how to characterise and calibrate quadrupole mass spectrometers (QMS), and the second is on how to perform traceable outgassing rate measurements. These two related Technical Specifications should enable the improvement of materials for the semiconductor industry and make the control of partial pressures in industrial processes more reliable. The Technical Specifications should also help manufacturers of QMS to improve their metrological performance.

Need
Vacuum is an important and indispensable tool for many industrial applications such as the semiconductor industry, photovoltaic, lighting, nanotechnologies, surface engineering, pharmaceutical industry and food packaging. The vacuum environment is also an indispensable prerequisite in numerous research fields such as electron microscopy and other vacuum spectroscopy methods, surface science, particle accelerators and synchrotron light sources and space research.

Industry and research often need a complete characterisation of the vacuum process environment, which includes (in addition to the total pressure) the gas composition i.e. which species are present in the vacuum and their partial pressures. Therefore the "cleanliness" of a vacuum – or more technically the absence or sufficiently low partial pressure of specific gas species or vapours – is vital. Although oil–free vacuum pumps and other components have improved cleanliness considerably, components can still be a source of unwanted gases that can be released or "outgassed" into the vacuum. Outgassing rates are therefore a vital quality assurance figure in vacuum technology. However there is currently no internationally standardised way to measure such rates and to establish their traceability to the SI system of units.

Key outputs from EMRP JRP IND88 VAX were guidelines on how to characterise and calibrate QMS and how to perform traceable outgassing rate measurements. QMS are needed to perform outgassing rate measurements therefore they were a prerequisite for the latter and so the results were closely related.

The ISO Technical Committee 112 "Vacuum Technology", the primary supporter of this SIP, has requested that these results from JRP IND88 should be implemented into Technical Specifications so that a wider community can use the results from the project and so that the necessary steps are taken to improve the traceability of partial pressure and outgassing rate measurements. In addition, in January 2015 ISO TC 112 implemented two new projects New Work Item Proposal (NP) Technical Specification (TS) 20175 "Calibration of quadrupole mass spectrometers for partial pressure measurement" and NP TS 20177 "Procedures to measure and report outgassing rates" within its business plan.

The need for standardised procedures to characterise and calibrate QMS was highlighted in the results of an end user questionnaire conducted within JRP IND88. The end users (who completed the questionnaire) represented the field of high energy accelerators and fusion machines, suppliers of Extreme ultraviolet (EUV) components, positioning devices and research contract services from industry, (i.e. industries involved in the production of semiconductors). In addition, JRP IND88 demonstrated a number of metrological problems for QMS, such as the dependence of the signal on the operational mode, interference between gas species, non-linearities and long-term instabilities of sensitivities. JRP IND88 concluded that particular care needs to be taken to overcome these problems in order to obtain valuable and reliable results for QMS and that some of these problems (e.g. dependence of the signal on the operational mode, interference between gas species and long-term instabilities of sensitivities) can only be solved by standardised procedures to characterise and calibrate QMS.

Outgassing rate measurements, which were, in the past, mainly performed by scientists in order to achieve very low pressures in vacuum systems, nowadays have great importance in industry; in particular for EUV-Lithography used in wafer illumination and for high energy accelerators used in cancer therapies. The results obtained within JRP IND88 identified suitable traceable and validated methods for outgassing rate measurements for use by such industries, however in order to support comparability between outgassing rate measurement systems, using different methods, standardisation is required.

Objectives
The objectives of the project are:

1. To incorporate the results obtained for the characterisation and calibration of QMS of EMRP JRP IND88 into ISO/NP TS 20175 in order to support their wider dissemination and uptake.
2. To incorporate the results obtained for the procedures of outgassing rate measurements of EMRP JRP IND88 into ISO/NP TS 20177 in order to support their wider dissemination and uptake.

Activities
The project will undertake two activities related to the objectives:

1. To work with ISO TC 112 to develop a Technical Specification for the characterisation and calibration of QMS.
2. To work with ISO TC 112 to develop a Technical Specification for procedures to measure and report outgassing rates.

Impact
The two Technical Specifications are important for end users from the field of high energy accelerators, suppliers of EUV components and positioning devices and from the coating and semiconductor industries. The Technical Specification for the characterisation and calibration of QMS will allow end users to compare the performance of QMS and use them with the best possible accuracy. A more accurate characterisation of QMS will also support their development.

The Technical Specification for outgassing rate measurements will make these measurements more reliable and comparable and therefore costly "local" solutions (used in industry to provide agreement between different suppliers of vacuum components) should become obsolete.

The wider impact of the SIP is that processes in the semiconductor industry and coating industry can be improved in terms of gas consumption, speediness of processes and productivity. This will be a consequence of the improved characterisation of QMS and of components built into vacuum plants. Large accelerator (e.g. CERN, ESRF, DESY) and fusion (ITER) facilities in Europe will greatly

benefit from traceable measurements of residual gases and outgassing of materials. This will also improve quality assurance procedures for European vacuum equipment manufacturers.

5.5.2 Section B1.b: Overview of the objective(s)

This section should describe the objectives of your project; this should be more detailed than in Section B1.a.. A numbered list is recommended (if more than one objective is required). An overall objective should also be included for the project

Example 1: B1.b Overview of the objectives

The overall objective is to create impact from the results of JRP IND88 VAX via incorporating measurement techniques into formal ISO Technical Specifications. These results will be explained to and coordinated with experts from other countries who were not involved in JRP IND88. To begin with this will be carried out within working group 2 (WG 2) "Vacuum Instrumentation" of ISO TC 112 "Vacuum Technology" which is the responsible group at the ISO level for technical drafts for this field. To do this it will be necessary to attend and organise WG 2 meetings. At a later stage, it will be necessary to explain the results of WG 2 discussions to the TC 112 committee and attend these meetings as well.

The project addresses the following objectives;

1. To incorporate the results obtained for the characterisation and calibration of QMS as part of EMRP JRP IND88 into ISO/NP TS 20175 in order to support their wider dissemination and uptake
2. To incorporate the results obtained for the procedures of outgassing rate measurements as part of EMRP JRP IND88 into ISO/NP TS 20177 in order to support their wider dissemination and uptake

Achieving these objectives will increase the accuracy of partial pressure measurement in vacuum in all fields and will make outgassing rate measurements more reliable.

Example 2: B1.b Overview of the objectives

The overall objective of the project is create impact from the results of JRP ENG100 GASEOUS by demonstrating the viability of traceable online industrial measurements of siloxanes in biogas and landfill gas and incorporating the outcomes of the laboratory and field trials into CEN draft standards prEN1673-1 and prEN16723-2.

The project addresses the following objectives:

1. To demonstrate the viability and benefits of traceable online industrial measurements of siloxanes in biogas and landfill gas (developed in EMRP JRP ENG100 GASEOUS) via laboratory validations and field trials of a new measurement method, and to disseminate the findings via a relevant biogas trade journal and a biogas trade association website. (WP1)
2. To incorporate the findings of the laboratory and field trials into CEN draft standards prEN1673-1 and prEN16723-2 in order to support their wider dissemination and uptake. (WP2)

Objective 1 will be achieved by undertaking field trials and laboratory validations to demonstrate the viability and cost-effectiveness of this new approach. It will entail:

(a) Using the traceable gas mixtures and methods developed in JRP ENG100 GASEOUS to validate an FTIR instrument for the online analysis of siloxanes.

(b) Performing exemplar measurements on samples of real landfill gas to demonstrate the applicability of the method.

(c) Carrying out a field trial at an industrial landfill site. The FTIR instrument will be used to deliver a case study on the traceable real-time measurement of siloxanes.

(d) Publishing the results of the SIP in a biogas trade journal and on a biogas trade association website.

Objective 2 will be achieved by presenting the findings of the SIP to CEN TC408 and, if applicable, to other European and International standardisation committees, such as ISO TC255 (Biogas) and ISO TC193 (Natural gas). This will facilitate their contribution to the CEN draft standards prEN1673-1 and prEN16723-2 in order to support their wider dissemination and uptake.

Achieving these objectives will directly facilitate the uptake of traceable measurements by industry via a validated instrument, the measurements from which will allow industry to make immediate decisions as to whether the biogas or landfill gas in the sample stream is fit for its required purpose (for example, injection into the natural gas network, use as vehicle fuel, or combustion in order to generate heat and power). The uptake of the work will enable the 'gap' in the current draft CEN TC408 standards to be filled by providing a method for the robust and traceable measurement of siloxanes in biogas.

5.5.3 Section B1.c: List of deliverables

You should list your deliverables in the table provided in Template 7: SIP protocol. The deliverables should align with the project's objective(s). It is anticipated that proposals will consist of at least 2 deliverables - one deliverable for impact and one mandatory deliverable for the completion of the reporting for the project. However more deliverables are possible if the SIP has more than one impact objective.

Deliverable descriptions should include, for example, standardisation activities, training, exploitation, uptake from users etc. and must provide evidence of a tangible high-level project output, such as the key output of a work package. Please remember that each deliverable should be able to be sent to EURAMET and stored, and must have been reviewed and approved by the whole consortium before being submitted to EURAMET by the coordinator.

Example 1: B1.c: List of deliverables

Relevant objective	Deliverable number	Deliverable description	Deliverable type	Partners (Lead in bold)	Delivery date
1	D1	Report on a field trial of traceable online measurements of siloxanes in landfill gases (including the validation of the FTIR instrument for the measurement of siloxanes and the results of the analysis of the landfill gas samples)	Report	**EEE,** FFF	M14
1	D2	Article based on the field trials published in a biogas trade journal and a biogas trade association website in order to disseminate the outputs of 14SIP55 to the European biogas industry	Trade articles	**EEE,** FFF	M18
2	D3	Statements from relevant CEN WG convenors confirming that the metrology outputs of 14SIP55 have contributed towards CEN draft standards prEN1673-1 and prEN16723-2	Statements from relevant CEN WG convenors	**EEE**	M18
n/a	D4	Delivery of all technical and financial reporting documents as required by EURAMET	Reporting documents	**EEE**, FFF	M18 + 60 days

Example 2: B1.c: List of deliverables

Relevant objective	Deliverable number	Deliverable description	Deliverable type	Partners (Lead in bold)	Delivery date
1	D1	Letter from ISO TC 112 confirming that the results from JRP IND88, related to QMS, have been incorporated in an approved Technical Specification TS 20175	Letter from the Technical Committee	**CCC**, DDD	M36
2	D2	Letter from ISO TC 112 confirming that the results from JRP IND88, related to outgassing rate measurements, have been incorporated in an approved Technical Specification for TS 20177	Letter from the Technical Committee	**CCC**, DDD	M36
n/a	D3	Delivery of all technical and financial reporting documents as required by EURAMET	Reporting documents	**CCC**, DDD	M36 + 60 days

Example 3: B1.c: List of deliverables

Relevant objective	Deliverable number	Deliverable description	Deliverable type	Partners (Lead in bold)	Delivery date
1	D1	Article submitted to a trade journal on the project results' from D1 and D4	Article	**AAA**, BBB	M36
1	D2	Letter from the JCGM confirming the acceptance of inputs from 14SIP99 and their consideration as contributions to JCGM Document 103 and Document 110	Letter from the JCGM	**AAA,** BBB	M34
2	D3	Documented feedback from end users regarding the dissemination and use of the validated software	Documented feedback from end users	**BBB,** AAA	M34
n/a	D4	Delivery of all technical and financial reporting documents as required by EURAMET	Reporting documents	**AAA**, BBB	M36 + 60 days

5.6 Section B2: Impact

5.6.1 Section B2.a: Impact

This section should be no more than 2 pages in length and should be much more detailed than your summary in Section B1a.

You should describe how your proposed project will make a positive difference to Europe (and internationally) by addressing the needs described in Section B1.a. This should **not** be a statement of what your project will do but a statement of the benefits the project's activities will bring to its immediate user communities and how these will contribute to the wider economy and society.

Please ensure that the impact you describe can realistically be achieved by your project.

- For a SIP focused on documentary standards describe how the new standard will be used (and by whom) and how this will contribute to wider social and/or economic impact. These standards should be at a European or international level and may be standards developed and published by formal standards developing organisations (such as ISO, CEN, etc.) or important industry standards (such as those developed by IEEE, CIE etc.). If a standard has been mandated by the European Commission (usually in support of an EC Directive) or is a critical need specified by an industry body this should be noted (and references provided). You should identify the most important documentary standards and the organisations/standards bodies/committees that will provide the most likely route to delivering a tangible impact and which will be the focus of the project's activities regarding standards. It is important to consider which standards are in real need of updates or improvements and/or standards that are due to be updated in the next few years and therefore where the project can deliver impact.
- For a SIP focused on uptake and exploitation of research outputs by the industrial or public sector communities, describe the effect your project will have on relevant user communities e.g. in industry and in the public sector (hospitals, air pollution monitoring, etc.). Impacts in this section should relate, in the first instance, to the direct benefit to the PRIMARY SUPPORTER via the uptake, exploitation and use of research outputs (new measurement capabilities, reference standards, devices, prototypes, new knowledge, etc.) from the RELATED JRP. It should then describe how this benefit will flow from the PRIMARY SUPPORTER to the wider community (e.g. via the supply-chain and/or horizontal effects) and then contribute to wider social and/or economic impact.

If applicable, describe any additional impacts to the metrology community such as increased demand for services, new markets, jointly provided services, improved networks with user communities etc.

For the wider impacts, please explain the **economic, social and environmental** impact that your project will make across Europe (and internationally). Where possible quantify each of the impacts numerically. You should also provide details of who will benefit from the project, and which aspects of the project each stakeholder group will benefit from.

If your project is expected to contribute to wider impact through EC Directives, regulations and/or legislation, you should provide details of this. Finally, describe how you will ensure that the maximum benefits and impact is achieved by your project.

Example 1: Section B2a: Impact

Vacuum is an important and indispensable tool for many industrial applications such as the semiconductor industry, photovoltaic, lighting, nanotechnologies, surface engineering, pharmaceutical industry and food packaging. The vacuum environment is also an indispensable prerequisite in numerous research fields like electron microscopy and other vacuum spectroscopy methods, surface science, particle accelerators and synchrotron light sources, space research.

Modern vacuum systems not only have to be robust and easy to operate, they also have to meet tough demands in terms of performance. Vacuum technology has matured a lot over the last 50 years, but there are still important challenges that need to be overcome for advanced industry applications.

Industry and research often need a complete characterisation of the vacuum process environment, which includes (in addition to the total pressure) the gas composition i.e. which species are present in the vacuum and their partial pressures. Therefore the "cleanliness" of a vacuum – or more technically the absence or sufficiently low partial pressure of specific gas species or vapours – is vital. Although oil –free vacuum pumps and other components have improved cleanliness considerably, components can still be a source of unwanted gasses that can be released or "outgassed" into the vacuum. Outgassing rates are therefore a vital quality assurance figure in vacuum technology. However there is currently no internationally standardised way to measure such rates and to establish their traceability to the SI system of units.

New materials with special mechanical and electrical properties are required for new vacuum applications and technologies. A topical subject in vacuum science and technology is the development of new vacuum compatible materials which have lower outgassing rates so that vacuum systems with ultimately better pressure can be built, or faster pump-down times can be achieved.

For very demanding technologies like EUV-Lithography the extreme vacuum cleanliness of materials and components is vital for avoiding contamination of very expensive optical components. The same is true in space research, where there can be enormous costs associated with the malfunction of delicate instruments in space missiles due to contamination caused by outgassing of nearby components.

Different gas species that are present in the vacuum environment may have different consequences on technological process. For example, for certain processes some gases may not be critical, while others may have a detrimental effect on the final product or process. Therefore accurate determination of partial pressures of different gases in the process chamber is required and the instruments that are most often used for this are QMS.

Direct impact for the primary supporter
The overall objective of this project is to create impact from the results of WP1 of JRP IND88 VAX via incorporating measurement techniques into formal ISO Technical Specifications under ISO TC 112.

- The new Technical Specification on QMS will be used by manufacturers and users of QMS and will improve their further development towards reliability.
- The new Technical Specification on outgassing rate measurements will be used by industrial measurement services as well as by scientists exploring materials with improved outgassing rates.

It is intended that following field tests of the two Technical Specifications and any associated improvements that the two Technical Specifications will be subsequently turned into documentary standards by ISO TC 112.

Wider impacts

Industrial impact
The new Technical Specification on characterisation and calibration of QMS will have direct impact on the reliability of partial pressure measurements in vacuum technology. By following standard procedures the traceability of partial pressure measurement to SI units can be established, which is currently rarely the case. Standardised calibration procedures will also be divided into several hierarchical metrology levels, from the "primary level" at NMIs through to in-situ calibrations that can be applied by end users in the field. Although experts in NMIs may already have enough knowledge to realise such primary calibration systems even without a written standard it is still necessary to standardise different calibration procedures with respect to the intended use of each QMS instrument.

In addition, a standardised procedure for general characterisation of the QMS will help users to compare different instruments from different manufacturers and to select the most appropriate instrument for their application. Based on such standardised procedures users could then make unambiguous technical specifications for equipment in procurement tenders, which would support fair competition amongst manufacturers.

Investigations of the time stability of QMS instruments within JRP IND88 also demonstrated that they are significantly less stable for ionisation gauges than for total pressure measurements. Poor stability may require frequent checking of calibration status or recalibration by the user, which can only be performed in-situ without removing the instruments from the vacuum system. Therefore, recommendations will be given in the Technical Specification for the design of suitable calibration attachments for end user tools and systems; in order to improve the accuracy of such in-situ calibrations.

Outgassing rate measurements are closely linked to residual gas analysis, particularly when a complete characterisation of a vacuum material or component requires determination of partial outgassing rates of different gas components. To specify the uncertainty of measured partial outgassing rates appropriate calibration of QMS is needed (according to the proposed standard on calibration of QMS). In addition, the construction of measurement apparatus and a standardised measurement procedure for outgassing rate measurements may significantly contribute to the final uncertainty.

The spread of outgassing rates of different materials published in vacuum literature in the past 50 years is unacceptably high. Comparison of published results obtained by different in-house developed methods is also practically impossible, as detailed descriptions of measurement procedures are often missing. Further to this, very rarely in the published literature is the measurement uncertainty estimated and so the accuracy of the results is unknown. Standardisation of outgassing rate measurements will significantly improve this, as the uncertainty contributions for standardised systems and methods will be evaluated, therefore the accuracy of the results will be known or will become easy to evaluate.

A standard for measuring and reporting the outgassing rate will also impact the global trade of vacuum components. Large vacuum systems such as particle accelerators or the EUV tools used in semi-conductor manufacturing are composed of many vacuum components. In the design phase the outgassing rate of each component needs to be carefully considered, as the total outgassing rate (which is sum of contributions from all components) determines the ultimate pressure and gas composition. Such applications are also critical with respect to the cleanliness of the components as when the outgassing rate is not accurately known, a worst case estimate is made and this can lead to oversizing of vacuum pumps and hence unnecessary increased costs and energy use.

For large vacuum systems many components are purchased from different vendors. In the current situation where no international standard on outgassing rate measurements exists, the organisations building or operating large vacuum systems are forced to develop their own in-house procedures for testing and supporting technical specifications. However, if such in-house procedures can be replaced with internationally recognised standard procedures there will be significant economical and metrological benefit for the users of vacuum components.

The current situation is also difficult for the manufacturers of the components for large vacuum systems, as they have to apply several different methods for the characterisation of the same product in order to prove its conformance with the specifications of different customers and their in-house procedures. Therefore a single standardised procedure would help to simplify the qualification of vacuum components.

Developers of new materials with lower outgassing rates will also benefit from new a standard, as it will enable the accurate characterisation of new materials with a well-defined uncertainty. In this way the new standard will have an indirect impact on the reduction of energy consumption and increased productivity. This will be achieved by the construction of vacuum systems with new low outgassing materials, which will enable the use of smaller capacity pumps to achieve the same pressure. Reduced outgassing of the vacuum chamber can also lead to faster pump down and shorter cycle times leading to a reduction in costs.

Finally, the two Technical Specifications are important for end users from the field of high energy accelerators (used in cancer therapies), suppliers of EUV components (used in wafer illumination) and from the coating and semiconductor industries. The Technical Specification for the characterisation and calibration of QMS will allow end users to compare the performance of QMS and use them with the best possible accuracy. A more accurate characterisation of QMS will also support their development.

The Technical Specification for outgassing rate measurements will make these measurements more reliable and comparable and therefore costly "local" solutions (used in industry to provide agreement between different suppliers of vacuum components) should become obsolete.

Economic impact
The wider impact of the project is that processes in the semiconductor industry and coating industry can be improved in terms of gas consumption, speediness of processes and productivity. This will be a consequence of the improved characterisation of QMS and of components built into vacuum plants. Large accelerator (e.g. CERN, ESRF, DESY) and fusion (ITER) facilities in Europe will greatly benefit from traceable measurements of residual gases and outgassing of materials. This will also improve quality assurance procedures for European vacuum equipment manufacturers.

Example 2: Section B2a: Impact

This project will impact on two areas which are outside of the metrological community: firstly the vehicle emissions community (as described in the first two sections) and secondly the wider aerosol measurement community (as described in the "Impact on standardisation" section).

Impact for the primary supporter
During JRP ENV99 there was considerable interaction between the partners and the UN Economic Commission for Europe (UN-ECE) Particle Measurement Programme (PMP), with for example, several updates being given at PMP meetings, and PMP members participating at the JRP ENV99 workshops. This project will ensure that the newly-developed metrological expertise contributes to resolving unresolved issues related to the PMP calibration procedure in Regulation 83.

Direct impact on industry
More widely, impact will be generated through reliable traceability for particle number concentration measurement and for the calibration of condensation particle counters (CPCs) because this will lead to a greatly reduced effort in costs and time for manufacturers, research institutes, the automotive industry and NMIs. The automotive industry, the test laboratories and instrument manufacturers demand traceable standards for the calibration of the particle number concentration instruments from national metrological bodies. The results of JRP ENV99 WP1 will close the gap for a combustion particle number concentration standard for the calibration of these instruments. This is the basic prerequisite for consolidating the new metric in relevant European regulations. Furthermore, harmonised measurement protocols will replace, or at least amend national initiatives within Europe and enable comparability of measurement results. The enforceability of the related European Regulations cannot be assured before this work has been finished. Precisely tailored and thus more cost-effective developments of engine operating conditions and exhaust treatment will be possible, because the emissions can be measured more accurately, thereby reducing the safety margins needed to fulfil the emission regulations.

Many of the issues are common to analogous measurements in air quality, workplace monitoring, and elsewhere, and these areas will be impacted by the contribution of the project to standardisation documents produced within ISO TC24 SC4 WG12 and CEN TC264 WG32, as mentioned below.

Impact on standardisation
This consortium is well represented on appropriate bodies and this will enable results to be disseminated directly. Within the consortium there are members of several relevant technical standards committees, who will be in a position to make sure that the measurement issues addressed by JRP ENV99 are fully discussed, and that relevant sections of the documents are drafted. These include:

- ISO TC24 SC4 (Particle characterisation) WG12 Electrical mobility and number concentration analysis for aerosol particles.
- CEN TC264 WG32 Air quality – Determination of the particle number concentration.

The results of JRP ENV99 WP1 will be used in this project to support the implementation of existing regulations, and, more specifically, guide their future amendment so that it has improved metrological content:

- COMMISSION REGULATION (EC) No 692/2008 of 18 July 2008 implementing and amending Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, ANNEX XVII AMENDMENTS TO REGULATION (EC) No 715/2007 (p 129).
- AMENDMENTS TO UNECE REGULATIONS REGULATION No. 83; Proposal for draft Supplement 7 to the 05 series of amendments to Regulation No. 83 (Emissions of M1 and N1 categories of vehicles); ECE/TRANS/WP.29/GRPE/2008/.
- REGULATION (EC) No 595/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Directives 80/1269/EEC, 2005/55/EC and 2005/78/EC Clause 14, page 2).

Wider impacts

Economic impact
The economic cost of air pollution from Heavy Goods Vehicle emissions alone (mainly the health-based costs of $PM_{2.5}$ and NO_2) is estimated at €43-€46 billion per year within EEA member countries [4]. Even a small decrease in the health effects from airborne particles would lead to substantial economic benefits.

The emphasis on enabling new instrumentation to be reliably calibrated for well-defined parameters would provide a valuable stimulus and a technical advantage to European instrument manufacturers in the global market, estimated at several billion euros per year.

Societal impact
There is widespread concern across Europe that poor air quality is still a significant health risk, especially to vulnerable people in urban areas, and those particle emissions from diesel vehicles, in particular, are not decreasing as predicted. This project will help to increase public confidence in measurements of particle pollution, and increase confidence that the steps taken by governments are soundly based.

Environmental impact
Air pollution by particles – whether relating to air quality or climate change – is an international problem, with many of the pollutants freely crossing national borders and travelling long distances. Common methods and measurement infrastructures are therefore essential for good science, and fair and effective implementation of regulations, across Europe and indeed further afield, if Europe is to play a leading role in the solution of these global challenges. Although it is not possible to quantify the reduction in pollution due to this project, because many other factors are involved, the project will enable reductions in particle pollution to be achieved more effectively, with consequent improvements to human health and climate change. The project is therefore expected to have high direct and indirect impact, notably in the environmental area.

European contribution to global challenges
Ultimate impacts will include:

- More competitive European engine and vehicle industries;
- Improved legislation and implementation of legislation, reducing the risk of wasting resources on ineffective or counterproductive measures;
- A reduction in the substantial health effects of airborne particles, through scientifically justified and validated mitigation measures.

Example 3: Section B2a: Impact

The project will transfer the outputs of JRP IND99 on the accurate measurement of water vapour transmission rates (WVTR) through thin film barrier materials used extensively in the encapsulation of advanced electronics to an innovation centre and key relevant standards committee and industrial association.

Methods currently used in industry for determining the performance and acceptance of barrier materials are typically *ad-hoc*, inaccurate, untraceable and not harmonised. This project will lead to the up-take of outputs from JRP IND99 by equipping industry (e.g. manufacturers of products based on flexible electronics, barrier material producers and instrument manufacturers for measuring encapsulation performance and degradation) with the support and guidance to enable accuracy and consistency in measurements of WVTR, leading to the adequate demonstration of encapsulation.

Benefits for the primary supporter
Exploitation of the outputs from JRP IND99 will directly benefit the primary supporter as it will instil a greater understanding of the sensitivities of various parameters in the measurement of WVTR within the organisation and will result in the development of a capability for high accuracy measurements that can be calibrated with traceable reference standards. The outputs of JRP IND99 will be transferred in the form of guidance on the design and assembly of the facility and calibration. CPI is a technology innovation centre and part of a wider innovation centre focused on advanced manufacturing. It has very strong links to industry throughout Europe and uses applied knowledge in science and engineering combined with state of the art facilities to enable its clients to develop, prove, prototype and scale up the next generation of products and processes. Therefore, CPI is the ideal primary supporter as the benefits gained from this project will flow directly to the communities working in organic electronics and encapsulation via its clients.

In addition the project will transfer the results of JRP IND99 into standardisation. The reputation and international standing of the targeted standards organisations (i.e. ISO/TC61 and IEC/TC 119) will ensure the up-take of the outputs from JRP IND99 by industry and that they are disseminated widely and with maximum impact to end users. New work items have recently been proposed under ISO/TC61 sub-committee 11, working group 3 “Plastics”, including the 15106 series for WVTR measurements which includes methods based on the calcium corrosion test and mass spectrometry. This SIP is timely and provides a perfect opportunity and the most likely route to delivering a tangible impact from the outputs of JRP IND99. The outputs of the JRP have identified the critical parameters in the measurement of WVTR and their sensitivities with respect to measurement accuracy and uncertainty. A new work item will focus on over-arching guidance to improve the accuracy of WVTR measurements and their estimated uncertainties. It will use the outputs from JRP IND99 to set out the most critical parameters in the measurement equation so that these are considered and adopted in measurement facilities worldwide to provide the basis for future improvements in international comparability.

Wider industrial impact
International industrial bodies such as the OEA (a working group representing the whole value chain in organic and printed electronics globally) recognises encapsulation as one of the major considerations in the quest to make applications based on flexible and printed electronics viable. A working group dedicated to encapsulation has highlighted as a critical need for standardisation, accuracy and more reliability in measurements of the WVTR of barrier layers [4]. There is therefore, an opportunity within this community to exploit the outputs from JRP IND99 and to maximise their up-take by industry. Hence involvement in this organisation will result in the dissemination of outputs to the relevant communities of manufacturers, suppliers and end-users. Direct beneficiaries of this work are manufacturers of products based on organic electronics and graphene, barrier producers, instrument manufacturers for measuring degradation and encapsulation, standardisation committees, testing labs and the metrology community.

Specific examples of high-impact wider benefits are:

- Enabling an accurate assessment of the performance and suitability of encapsulating barrier layers.
- Supporting instrument developments aimed at assessing encapsulation performance.
- Supporting advances in organic semiconductor materials and devices, yielding increased material stability and device lifetimes and providing shorter time-to-market for new products from organic electronics developers.
- Enabling valid comparisons between different organisations and increasing product reliability.

This project will also have additional impact on the metrology community as there will be an increase in demand for reference materials for calibrating instrumentation for WVTR as a result of the input to documentary standards and dissemination of best practices in measurement.

Economic, environmental and social impact across Europe
European designated institutes have a broad range of expertise in measurement methods to underpin the development of flexible organic electronics however no single institution has the complete set of required facilities and/or expertise needed to address the current challenges. EURAMET enables leverage of national funding schemes and provides for closer integration with industrial developers and end users which is essential in this research area where closing the gaps between metrology and product development are key to market success. Whilst the perspective of this project is global there is a strong European focus because:

- It is in line with the commitment to reach the EU energy efficiency and climate protection targets. WVTR measurements will support the development of barrier layers which guarantee the lifetime of OLEDs. The EC has published a green paper on solid state lighting to explore the barriers for the wide deployment of efficient light sources, such as OLED lighting and to put forward policy suggestions. Extensive changes have been put forward such as the phasing-out of the incandescent light bulb (EG 244/2009 and EG 859/2009) as well as new requirements for fluorescent and high intensity discharge lamps (EG 245/2009 and EU 347/2010). As incandescent lamps are being phased out in Europe, new energy efficient and eco-friendly lighting technologies such as OLEDs are starting to replace them. This is predicted to save annually close to 80 TWh of electrical energy. This will result in a reduction of 32 million tons of CO2 emission and economic savings worth 11 billion euros a year.
- Metrological advances are key to determining degradation mechanisms in organic electronic devices, particularly with nanostructured thin-films incorporating novel organic semiconductor materials. The success of this SIP would assist in protecting and advancing Europe's strong position in organic, plastic and printed electronics, both in terms of support for material and product improvements and in leading standardisation efforts. European NMIs would possess greater capability for metrology relevant to organic and plastic electronics, hence providing a solid base of measurement expertise to further support commercial enterprises in the EC.

By developing products that generate energy without burning fossil fuels (such as solar cells), the generation of CO_2 can be reduced. In this way meeting government targets of an 80 % reduction of 1990 CO_2 emissions by 2050 are possible. With a 12 % target market penetration by 2020, solar cells would cut as much as 196 million tons in CO_2 emissions per year. The decentralisation of energy generation by photovoltaic systems supports the local employment policy and, thus, it will improve EC socio-economics.

5.6.2 Section B2.b: Data management

For EMPIR call 2017 onwards, the Grant Agreement will contain conditions related to open access to research data. Projects that 'opt-in' will be required to prepare a Data Management Plan (DMP) to detail the data that the project will generate, how it will be exploited and made accessible for verification and re-use, and how it will be selected, managed and preserved in repositories.

Please note that even if projects 'opt-in' to having a DMP they will not be required to open up all of their research data. The DMP applies primarily to the data needed to validate the results presented in scientific publications.

The use of a DMP is obligatory for all projects that do not 'opt-out'.Projects can opt-out on the following grounds:

- Incompatibility with the Horizon 2020 obligation to protect results that are expected to be commercially or industrially exploited
- Incompatibility with the need for confidentiality in connection with security issues
- Incompatibility with rules on protecting personal data
- Incompatibility with the project's main aim
- If the project will not generate / collect any research data, or
- If there are other legitimate reasons not to provide open access to research data

Further information on DMPs is available in the EMPIR Reporting Guidelines Part – 9 Preparing data management plans and in Reporting Template 9 – Data Management Plan.

A proposal will not be evaluated more favourably if the consortium agrees to share its research data, nor will it be penalised if it opts-out.

The consortium's approach to research data management should be detailed in section B2.b for projects that both opt-in and opt-out, and should include the following issues:

- How will data be exploited and/or shared/made accessible for verification and reuse? If data cannot be made available, why?
- What standards will be applied?
- How will data be selected, managed and preserved?

You must state whether your proposal will 'opt-in' or 'opt-out' and explain why. This section should be a maximum of 1 page.

5.7 Section B3: The quality and efficiency of the implementation

5.7.1 Section B3.a: Overview of the consortium

This section should be a maximum of 1 page.

If only one partner is involved, explain how the experience of the organisation will allow it to generate significant impact. Demonstrate coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources. If more than one partner is involved show the complementarity of the participants within the consortium. Explain how the consortium brings a balance of skills and high quality experience to the project.

You must explain the contribution of all partners, even if they have a small role in the project. Please do not name individual people or include collaborators.

Example: Section B3.a: Overview of the consortium

The two partners in this SIP (AAA and BBB) were the main partners in WP1 of JRP IND88 VAX, the project related to the two SIP objectives.

During JRP IND88 AAA established a primary standard for partial pressures to calibrate QMS and make outgassing rate measurements traceable. In addition, AAA has gained experience in the characterisation of QMS and possible calibration methods. From this AAA drafted the text for a Technical Specification to characterise QMS which is the basis of the new work item proposal which has been successfully balloted within ISO TC 112. Similarly, AAA gained experience in measuring outgassing rates in JRP IND88 and drafted text for a Technical Specification for traceable methods of outgassing rate measurement which will be the basis of the new work item proposal which is presently under balloting within ISO TC 112. AAA, as a member of DIN, also has extensive competence and experience in standardisation work at the national and international level. In addition, the infrastructure of AAA supports the organisation of meetings on its premises which reduces the costs of hosting such meetings.

AAA and BBB together have submitted a patent application which describes the first possibility of a reference outgassing sample and may enable in the future the comparison and validation of outgassing rate measurement systems, thus demonstrating the good working relationship of AAA and BBB in this field.

BBB has many years of experience in the use of QMS under different operational conditions including extreme high vacuum. In the past ten years BBB has performed several research projects with industrial partners on the characterisation of outgassing of different vacuum materials. To do this BBB has built different outgassing measurement systems and developed methods for in-situ calibration of QMS instruments for partial pressure and gas flow (outgassing) measurements. BBB also has significant expertise of the static (pressure rise) method for outgassing rate measurements and expert knowledge on this matter for standardisation.

5.8 Section C: Detailed project plans by work package

This section should describe the work planned to meet the objectives described in Section B1.b and to deliver the summary list of deliverables in Section B1.c.

Your proposal must contain:

- A minimum of 1 "Impact" work package
- 1 "Management and coordination" work package (mandatory).

If more than one objective is identified leading to more than one deliverable then additional "Impact" work packages must be included.

Within the work packages, your activities should consist primarily of accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues, mutual learning exercises, studies (including design studies for new infrastructure)

and may also include complementary activities for strategic planning, networking and coordination between programmes in different countries.

Please do NOT include any photographs, diagrams or lists of references in Section C. Lists of references should only be included in Sections E and F, as appropriate (see Sections 5.12 and 5.13).

5.8.1 Section C1: Impact on [objective X]

You should choose a title for each task that reflects the relevant objective.

For each task use the activity table format in Template 7: SIP protocol. Using this table, describe the activities that will be undertaken and the role of each partner in the activity. You should include target uncertainties, the number of samples, parameters and selection criteria etc. Where an activity relies on input from another activity, the text should include reference to that dependency. All partners involved in the activity should also be listed in the appropriate column, with the lead partner in bold.

For each deliverable in Section B1.c you need to include an activity for the submission of the completed deliverable to EURAMET.

Finally, if a Linked Third Party is included in your project, they should not be mentioned in the activities. Instead, a sentence similar to "The Linked Third Party NNN will work with partner BBB on this task." should be included under the activities table.

Example 1: Section C1 WP1: Impact on end user community and JCGM via publications

Task 1.1: Impact on end user community

Activity number	Activity description	Partners (Lead in bold)
A1.1.1	AAA with support from BBB will draft a paper based on the agreed outline from A1.1.1, obtaining appropriate sign-off from all authors. The paper will include the case study results of the analysis of XXX and YYY data from A2.1.4.	**AAA**, BBB
A1.1.2	AAA with support from BBB will obtain confirmation from XXX and YYY that the draft paper from A1.1.2 addresses their concerns. If the paper does not address their concerns AAA and BBB will revise the paper.	**AAA,** BBB
A1.1.3	AAA with support from BBB will draft an article (to be submitted to a trade journal) on the project outcomes D1 and D4.	**AAA**, BBB
A1.1.4	AAA with support from BBB will discuss and agree the draft article from A1.1.6, with end-users XXX and YYY. AAA and BBB will then finalise the article and submit it to an appropriate trade journal.	**AAA**, BBB
A1.1.5	AAA on behalf of AAA and BBB will send EURAMET D2; Article submitted to a trade journal on the project results' from D1 and D4.	**AAA**, BBB
A1.1.6	Information about the project's results in terms of D1 and D2 will be advertised by AAA and BBB on the AAA and BBB public web sites as news stories/webpages/newsletters as well as via the new European Centre for Mathematics and Statistics in Metrology. Targeted emails will also be sent to end users via mailing lists such as those operated by EURAMET TC-1078 and TC-21.	**AAA**, BBB

Task 1.2: Impact on JCGM

Activity number	Activity description	Partners (Lead in bold)
A1.2.1	AAA with support from BBB will prepare an outline of contributions to JCGM document 103 on modelling and JCGM document 110. For the contributions AAA and BBB will give examples and agree the scope and content with JCGM. The contributions to JCGM will include the case study results of the analysis of XXX and YYY data from A2.1.4.	**AAA,** BBB
A1.2.2	AAA with support from BBB will draft the contributions to JCGM document 103 and JCGM document 110 based on the agreed outline from A1.2.1.	**AAA,** BBB
A1.2.3	AAA will obtain confirmation from JCGM that the contributions from A1.2.2 are suitable for JCGM documents 103 and 110. If the contributions are not suitable AAA with support from BBB will amend the contributions in light of any comments from JCGM. AAA with support from BBB will also amend the contributions to JCGM document 103 and JCGM document 110.	**AAA**, BBB

A1.2.5	AAA on behalf of AAA and BBB will send EURAMET D3; Letter from the JCGM confirming the acceptance of inputs from 14SIP99 and their consideration as contributions to JCGM Document 103 and Document 110.	**AAA**, BBB

Example 2: Section C1 WP1: Impact on industry

Task 1.1: Validation of an FTIR instrument for online siloxane measurements using traceable reference gas mixtures

The aim of Task 1.1 is to use the traceable gas mixtures and methods developed in JRP ENG100 GASEOUS to validate the FTIR instrument developed by FFF for the online analysis of siloxanes.

Activity number	Activity description	Partners (Lead in bold)
A1.1.1	FFF and EEE will produce a written plan for the validation tests which will use at least two different types of siloxane reference gas mixtures from JRP ENV33. The siloxane reference gas mixtures will contain a number of siloxanes in methane and synthetic biogas (methane, carbon dioxide and nitrogen). The plans will take into account the highly adsorptive nature of siloxanes when considering the sampling set-ups. EEEs reference gas standards, of the highest-available accuracy, will be used in order to provide the utmost confidence in the measurements obtained by the FTIR instrument.	**FFF**, EEE
A1.1.2	EEE will prepare and despatch the multi-component siloxane reference gas mixtures specified in A1.1.1 to FFF.	**EEE**
A1.1.3	FFF and EEE will use the multi-component reference gas mixtures prepared in A1.1.2 to perform validation tests using the FTIR instrument and will optimise the performance of the FTIR instrument for the measurement of individual siloxanes, total siloxanes, methane and carbon dioxide.	**FFF**, EEE
A1.1.4	FFF and EEE will convert the A1.1.3 FTIR instrument measurements of the concentration of individual siloxanes to a measurement of total siloxanes / total silicon. A novel chemometric method will be used which calculates the total siloxane/silicon content directly by modelling the siloxanes region of the spectra (850 cm^{-1} – 1250 cm^{-1}).	**FFF**, EEE
A1.1.5	Using input from A1.1.3 and A1.1.4, FFF and EEE will produce a summary report on the validation of the FTIR instrument for the measurement of siloxanes. This will provide input for D1.	**FFF**, EEE

Task 1.2: Exemplar measurement of siloxanes in real landfill gas samples

The aim of Task 1.2 is to undertake exemplar measurements of siloxanes in real landfill gas samples using FFF's FTIR instrument or EEE's GC method from JRP ENG100 GASEOUS.

Activity number	Activity description	Partners (Lead in bold)
A1.2.1	FFF and EEE will prepare detailed written plans for obtaining landfill gas samples, which will include an assessment of what is required for end-user analytical needs. As the samples may not be able to be analysed by FFF and EEE at the same time, it is essential that the sampling campaign is planned carefully. Siloxanes have been shown to decay in sample bags, so the use of other passivated sample vessels, such as Silonite canisters or Sulfinert-passivated sample cylinders, will be required. The samples will be obtained by FFF in A1.2.2 from a collaborator that operates an industrial landfill facility. One potential collaborator is XXXX, which operates 22 landfill sites across the UK. It is expected that the samples will be obtained from XXX's landfill site in Devon, UK, but alternative solutions are also available (see section D1).	**FFF**, EEE
A1.2.2	FFF will obtain the landfill gas samples as specified in A1.2.1 (NB the numbers of samples required will be decided as part of the activities of A1.2.1).	**FFF**
A1.2.3	FFF will analyse the siloxane fraction content of the landfill gas samples obtained in A1.2.2 using their FTIR instrument and EEE will use their GC method. The results will be processed by each respective partner. Due to their industrial origins, the samples will not be straightforward to analyse either on FFF's FTIR instrument (due to possible spectral interferences), or using EEE's GC method (which has been developed for the analysis of 'clean' reference gas mixtures). These measurements will therefore provide an excellent case study demonstration of the performance of both instruments.	**FFF**, EEE
A1.2.4	Using input from A1.2.1, A1.2.2 and A1.2.3, EEE and FFF will produce a summary report of the results of the analysis of the landfill gas samples. This will provide input for D1.	**EEE**, FFF

Task 1.3: Online measurements of siloxanes in landfill gas

The aim of Task 1.3 is to demonstrate the performance of the FTIR instrument by delivering a case study of traceable real-time measurements of siloxanes at the same landfill site used in Task 1.2.

Activity number	Activity description	Partners (Lead in bold)
A1.3.1	FFF and EEE will develop written plans for demonstrating the performance of the FTIR instrument via a case study of traceable real-time measurements of siloxanes at the same landfill site as used in Task 1.2. These written plans will include the definition of the number of sampling points (at least 3) and the periodicity of the checks.	**FFF**, EEE
A1.3.2	FFF will set up their FTIR instrument and sampling system on-site, with continuous, real-time sampling being performed from multiple points before, during and after the siloxane abatement process. The validity and drift of readings from the analyser will be checked periodically during the trial using a multi-component siloxane gas standard provided by EEE. FFF will process and summarise the results.	**FFF**, EEE
A1.3.3	Through A1.3.2, FFF and EEE will demonstrate the benefits of the FTIR instrument technology to the site operators in real time.	**FFF**, EEE
A1.3.4	Using input from A1.3.1 and A1.3.2, FFF and EEE will produce a summary report on the results from the online measurement of siloxanes at an industrial landfill site using the FTIR instrument. This will provide input for D1.	**FFF**, EEE
A1.3.5	FFF and EEE will prepare D1, a final report on a field trial using the FTIR instrument of traceable online measurements of siloxanes in landfill gases (including the validation of the FTIR instrument for the measurement of siloxanes and the results of the analysis of the landfill gas samples). This will combine the summary reports from A1.1.5, A1.2.4 and A1.3.4. This final report will include an assessment of the suitability of the FTIR instrument for online siloxane measurements.	**FFF**, EEE
A1.3.6	EEE, on behalf of EEE and FFF, will send EURAMET D1, Report on a field trial of traceable online measurements of siloxanes in landfill gases (including the validation of the FTIR instrument for the measurement of siloxanes and the results of the analysis of the landfill gas samples).	**EEE**, FFF

Task 1.4: Publication of articles in a biogas trade journal and on a biogas trade association website

The aim of Task 1.4 is to disseminate the results of the SIP to the wider biogas community through a publication in a biogas trade journal and a on a biogas trade association website.

Activity number	Activity description	Partners (Lead in bold)
A1.4.1	EEE and FFF will publish an article based on the field trials from Task 1.3 in a biogas trade journal such as *Anaerobic Digestion & Biogas News, Local Authority Waste & Recycling* or *European Biogas Association Newsletter*. EEE will e-mail a copy of this article to the SIPs key stakeholders. EEE and FFF will also publish an article based on the field trials on a biogas trade association website.	**EEE**, FFF
A1.4.2	EEE, on behalf of EEE and FFF, will send EURAMET D2, Article based on the field trials published in a biogas trade journal and a biogas trade association website in order to disseminate the outputs of the SIP to the European biogas industry.	**EEE**, FFF

Example 3: Section C1 WP1: Impact on standardisation

Task 1.1: Characterisation and calibration of QMS

Activity number	Activity description	Partners (Lead in bold)
A1.1.1	CCC with support from DDD will produce a first working draft on the characterisation and calibration of QMS. The first working draft will be based on the results of JRP IND88 VAX and will take into consideration the first comments of ISO TC 112 which were given during the New Work Item Proposal ballot (NP ballot). This first working draft will be the first to be discussed at the international level within WG2 of ISO TC 112.	**CCC**, DDD

A1.1.2	CCC with support from DDD will discuss the working draft from A1.1.1 within WG2 of ISO TC 112. Included in the discussions will be manufacturers, distributors, and users of QMS (i.e. those outside of ISO TC 112 WG2) as well as relevant international organisations (e.g. IUVSTA). These stakeholders will be contacted through the partners' personal science network (some stakeholders have already indicated their interest to take part and/or were identified during the two workshops within JRP IND88 VAX). In addition, CCC will use LiveLink (a web-based collaboration and document management system) to contact stakeholders. In addition to this, input from the workshop in A2.2.2 will also be collated by CCC and DDD. Following collation of the comments from all discussions, CCC with support from DDD will produce an updated working draft that will be circulated within WG2 for final approval. The preparatory stage according to ISO directives will end with a working draft of the Technical Specification.	**CCC**, DDD
A1.1.3	CCC with support from DDD will circulate the working draft from A1.1.2 within ISO TC 112 as a committee draft and collate any comments from ISO TC 112.	**CCC**, DDD
A1.1.4	CCC with support from DDD will amend the committee draft from A1.1.3 according to comments received from ISO TC 112 in A1.1.3 and at the TC 112 meeting in A2.2.4.	**CCC**, DDD
A1.1.5	CCC with support from DDD will monitor and support the progress of the balloting of the amended committee draft from A1.1.4 (enquiry draft) and will collate the comments organised by ISO TC 112.	**CCC**, DDD
A1.1.6	CCC with support from DDD will amend the committee draft from A1.1.4 with any comments from ISO TC 112 in A1.1.5 and will finalise the committee draft as a Technical Specification. If there are no further comments in A1.1.5 the committee draft will be sent to ISO for publication without changes.	**CCC**, DDD
A1.1.7	CCC on behalf of CCC and DDD send EURAMET D1: Letter from ISO TC 112 confirming that the results from JRP IND88, related to QMS, have been incorporated in an approved Technical Specification TS 20175.	**CCC**, DDD

Task 1.2: Procedures to measure and report outgassing rates

Activity number	Activity description	Partners (Lead in bold)
A1.2.1	CCC with support from DDD will produce a first working draft on procedures to measure and report outgassing rates. The first working draft will be based on the results of JRP IND88 VAX and will take into consideration the first comments of ISO TC 112 which were given during the NP ballot. This first working draft will be the first to be discussed at the international level within WG2 of ISO TC 112.	**CCC**, DDD
A1.2.2	CCC with support from DDD will discuss the working draft from A1.2.1 within WG2 of ISO TC 112. Included in the discussions will be industrial services and other experts of outgassing rate measurements (i.e. those outside of ISO TC 112 WG2) as well as relevant international organisations (IUVSTA). These stakeholders will be contacted through the partners' personal science network (some stakeholders have already indicated their interest to take part and/or were identified during the two workshops within JRP IND88 VAX). In addition, CCC will use LiveLink (a web-based collaboration and document management system) to contact stakeholders. In addition to this, input from the workshop in A2.2.2 will also be collated by CCC and DDD. Following collation of the comments from all discussions, CCC with support from DDD will produce an updated working draft that will be circulated within WG2 for final approval. The preparatory stage according to ISO directives will end with a working draft of the Technical Specification.	**CCC**, DDD
A1.2.3	CCC with support from DDD will circulate the working draft from A1.2.2 within ISO TC 112 as a committee draft and collate any comments from ISO TC 112.	**CCC**, DDD
A1.2.4	CCC with support from DDD will amend the committee draft from A1.2.3 according to comments received from ISO TC 112 in A1.2.3 and at the TC 112 meeting in A2.2.4.	**CCC**, DDD
A1.2.5	CCC with support from DDD will monitor and support the progress of the balloting of the amended committee draft from A1.2.4 (enquiry draft) and will collate the comments given by ISO TC 112.	**CCC**, DDD
A1.2.6	CCC with support from DDD will amend the committee draft from A1.2.4 with any comments from ISO TC 112 in A1.2.5 and will finalise the committee draft as a Technical Specification. If there are no further comments in A1.2.5 the committee draft will be sent to ISO for publication without changes.	**CCC**, DDD
A1.2.7	CCC on behalf of CCC and DDD will send EURAMET D2: Letter from ISO TC 112 confirming that the results from JRP IND88, related to outgassing rate measurements, have been incorporated in an approved Technical Specification for TS 20177.	**CCC**, DDD

5.8.2 Section CN: Management and coordination

This work package must involve all partners as each has to contribute to project reporting and should attend project meetings. It is recommended that you structure your Management and coordination work package into 3 tasks:

Task N.1 Project management

Task N.2 Project meetings

Task N.3 Project reporting

Task N.2: Project meetings: You should include how many project meetings you plan to hold and their frequency (usually 6 monthly or 9 monthly or possibly annually, however the number and timing may depend on the duration of the project). If only one partner is involved then "project meetings" would involve that partner meeting with the Primary Supporter who would be a collaborator.

Task N.3: Project reporting: The dates for submission of the reporting will depend upon the duration of the project. However, there must be a minimum of 2 periods within the duration of the SIP and hence 2 periodic reports e.g. for a 36 month SIP reporting documents must be submitted at months 9, 27 (+ 45 days), 18, 36 (+ 60 days) and for an 18 month SIP reporting documents must be submitted at months 9 and 18 (+ 60 days).

Under the activity table you should include the sentence "All formal reporting will be in line with EURAMET's requirements and will be submitted in accordance with the Reporting Guidelines."

Example 1: Section CN WPN: Management and coordination

Task N.1: Project management

Activity number	Activity description	Partners (Lead in bold)
AN.1.1	The project will be managed by the coordinator from AAA who will be supported by BBB. The project partners will guide the project, attend the project meetings and organise progress meetings or call additional meetings if needed to ensure the overall project's success.	**AAA**, BBB
AN.1.2	BBB with support from AAA will establish a shared document and software repository (including version control mechanism, e.g., Subversions) for all written material and software developed during the project to facilitate collaborative working.	**BBB**, AAA
AN.1.3	Frequent communication by email and exchange of documents between AAA and BBB to report on the on-going progress as well as, communication with stakeholders such as from primary supporter XXX and collaborator YYY.	**AAA**, BBB
AN.1.4	AAA with support from BBB will manage the project's risks to ensure timely and effective delivery of the objectives and deliverables. As well as reviewing and addressing all potential Intellectual Property issuing arising.	**AAA**, BBB
AN.1.5	The consortium will ensure that any ethics issues identified (see Section D3) are addressed.	**AAA**, BBB

Task N.2 Project meetings

Activity number	Activity description	Partners (Lead in bold)
AN.2.1	The kick-off meeting involving all partners will be held approximately one month after the start of the project, at AAA.	**BBB**, AAA
AN.2.2	Four project meetings (including the kick-off meeting AN.2.1) will be organised and hosted by AAA and BBB for partners and representatives from primary supporter XXX and collaborator YYY to manage the activities in Tasks 1.1, 1.2 and 2.1 and to ensure that the project outcomes meet the requirements of XXX and YYY. The meetings will be held approximately every 9 months alternately at AAA and BBB. The meetings will review progress and will be used to ensure partners are clear as to their role for the next period. Where possible, meetings may be held as satellite meetings to important conferences or committee meetings.	**BBB**, AAA
AN.2.3	In addition, technical meetings of work package groups may be held whenever necessary, and will be arranged on an ad-hoc basis.	**BBB**, AAA

Task N.3 Project reporting

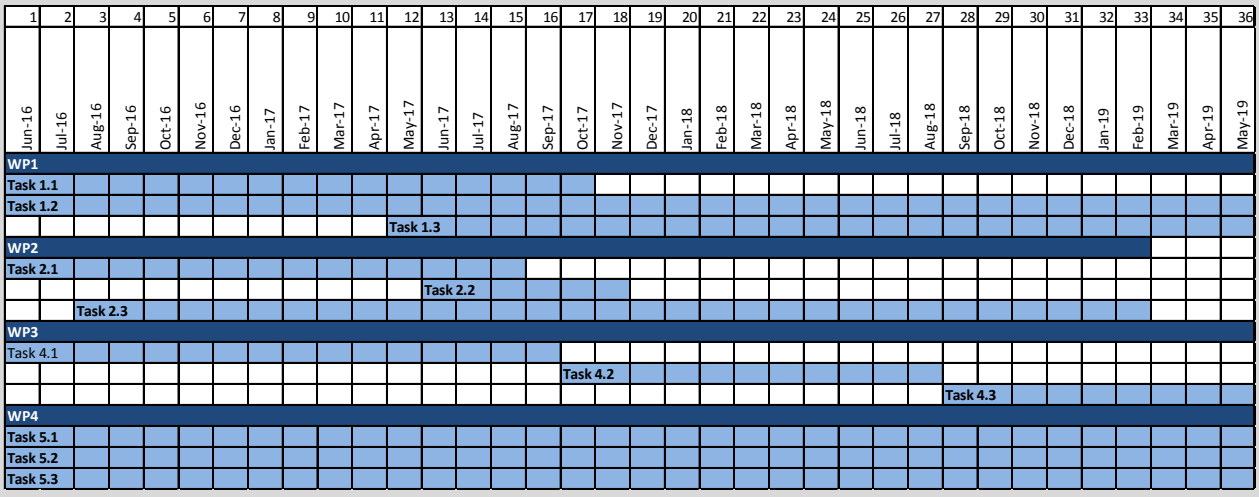
Activity number	Activity description	Partners (Lead in bold)
AN.3.1	One month after the signature of the grant agreement a publishable summary will be produced and submitted to EURAMET.	**AAA**, BBB
AN.3.2	Following Article 17 and 20 of the grant agreement, information will be submitted to EURAMET, in accordance with the procedures issued by them to enable EURAMET to comply with its obligations to report on the programme to the European Commission. • Progress reports will be submitted at months 9, 27 (+ 45 days), 18, 36 (+ 60 days) • Impact/Output reports will be submitted at the same times. All partners will provide input to these reports and the coordinator will provide these and updated publishable summaries to EURAMET. Payment requests will be submitted to EURAMET as appropriate.	**AAA**, BBB
AN.3.3	Periodic Reports (including financial reports and questionnaires) will be delivered at months 18 and 36 (+ 60 days) in accordance with Article 20 of the grant agreement. All partners will provide input to these reports and the coordinator will provide these to EURAMET.	**AAA**, BBB
AN.3.4	Final Reports will be delivered at month 36 (+ 60 days) in accordance with Article 20 of the grant agreement. All partners will provide input to these reports and the coordinator will provide these to EURAMET.	**AAA**, BBB

All formal reporting will be in line with EURAMET's requirements and will be submitted in accordance with the Reporting Guidelines.

5.9 Section CN+1: Gantt chart

The Gantt chart can be produced using MS Excel or MS Project but it must show the duration of each work package (impact and management and coordination) and task (by month). Please do NOT include lists of partners involved or the title for work packages or tasks.

Example: CN+2: Gantt Chart



5.10 Section D: Risks and risk mitigation

This section should be completed using the tables in Template 7: SIP protocol. You should separate your risks into 2 categories:

Section D1 **Impact risks** (problems related to the technical activities)

Section D2 **Management risks** (problems with staff, finances, IP etc)

Please note that where a collaborator is providing access to their facilities or equipment or a 'Linked Third Party' is included in your proposal you should include specific risks associated with their involvement.

Technical or impact risks should be considered on a Task by Task, although some tasks may be grouped for identical or similar risks. For each risk, you should identify:

- What the risk is
- What is the likelihood of the risk occurring and what impact this would have on the project
- What could the consortium do to decrease the likelihood of the risk occurring (mitigation)
- What the consortium could do if despite the mitigation the risk still occurs (contingency)

Example: Section D1 Impact risks

Risk (description)	**Likelihood and impact of occurrence**	**Mitigation** i.e. what the consortium will do to decrease the likelihood of the risk occurring	**Contingency** i.e. what the consortium will do if despite the mitigation the risk still occurs
Tasks 1.1 – 1.2 The New Work Item Proposal for the Technical Specification for ISO TC 112 is formally not accepted	Likelihood without mitigation: Medium Impact: Standard development cannot be immediately started or not at all. Likelihood after mitigation: Low	At the last ISO meeting the preliminary results of JRP IND88 were already presented and a resolution in support of standardisation was made unanimously.	Inform all participating members (P-members) of ISO TC 112 on the results of JRP IND88, in order to show the need for standardisation and then initiate a new ballot.
Tasks 1.1-1.2 No consensus is reached on the Committee Draft for the Technical Specification for ISO TC 112	Likelihood without mitigation: Medium Impact: Standard development will be on hold, delayed or even cancelled. Likelihood after mitigation: Low	The inclusion of QMS manufacturers and experts, together with the workshop for finalisation, will support the committee draft. In addition, sufficient time is allocated to discuss all details and any controversial points within the ISO TC 112.	Discuss the matter with P-members not in favour of the Committee Draft and look for a compromise. If a compromise is not possible then initiate a new ballot.
Task 1.1 Calibration data not available for sensors/measuring systems used to obtain end user measurement data	Likelihood without mitigation: Low Impact: Limits the value of the project outputs to end users. Likelihood after mitigation: Very low	Primary Supporter XXX or collaborator YYY have already agreed to provide the calibration data. If data not available from Primary Supporter XXX or collaborator YYY, contact other stakeholders from JRP IND99 and other NMIs to find alternatives for the classes of sensors employed for the quantities of interest.	Simulate calibration data rather than use real calibration information.
Task 2.1 Software development takes longer than planned owing to debugging requirements and failed validation tests	Likelihood without mitigation: Medium Impact: Delays publication of paper and input to JCGM. Software is not available for end users and the value of the project outputs is limited. Likelihood after mitigation: Low	Consortium has experience in developing software and has used this in the planned activities. Develop software in a modular, iterative manner, testing on simulated data early in the development process. Ensure realistic time scales for activities and deliverables and review regularly at project meetings. Allow additional time in the software schedule to allow for any errors and additional testing.	Delay completion of WP1. Revision of the SIP contract in agreement with the consortium and EURAMET MSU.
Task 2.1 End user measurement data not available for all of the three quantities (force, torque and pressure)	Likelihood without mitigation: Low Impact: Limits the value of the project outputs to end users. Likelihood after mitigation: Very low	If data not available from Primary Supporter XXX or collaborator YYY, contact other stakeholders from JRP IND99 to find alternatives.	XXX or YYY have already agreed to provide end-user measurement data. Simulate measurements rather than use real data.

Tasks 1.2 and 1.3: Real landfill gas samples are of complex compositions, which make analysis via traditional techniques challenging	Likelihood without mitigation: Medium Impact: The samples contain components that could interfere with components of interest, thus preventing measurement via current detection methods. Likelihood after mitigation: Low	A1.2.1 will provide a detailed plan that will include mitigation strategies based on the expected sample compositions. Different sample points will be selected before and after abatement processing steps. AAA has previous experience with measurement of a variety of real biogas types from EMRP JRP ENG100 which can be referred to.	Valuable data can still be obtained from complex samples and it can be used to highlight the challenge of this measurement to industry.
Tasks 1.2 and 1.3: The FTIR instrument is not able to perform the analysis of siloxanes in synthetic biogas mixtures or real biogas samples to the required limits of detection	Likelihood without mitigation: Medium Impact: The measurements taken by the FTIR cannot be compared to AAA's GC methods. Likelihood after mitigation: Low	Task 1.1 has been planned to provide an initial comparison using synthetic reference biogas mixtures. The results from this test will be used to assess if the instrument is capable of analysing the real biogas samples. If not, a new chemometric model could be applied.	Real biogas samples could be selected so that some useful comparative measurements can still be carried out.
Tasks 1.2 and 1.3: Access to the preferred landfill site is not available	Likelihood without mitigation: Medium Impact: Tasks 1.2 to 1.4 could not be delivered unless access to another landfill site is obtained. Likelihood after mitigation: Low	Initial discussions have been held with a potential collaborator (ZZZ), who has informed BBB that they can access their landfill site in Devon, UK. BBB and ZZZ have previously worked together and have a strong working relationship. Discussions regarding the detailed requirements of obtaining access to the landfill site will commence as soon as the project commences.	Access to another landfill site will be arranged. BBB have many contacts in industry and have already discussed this possibility with another company (UUU).
Task 1.4: The planned article in a biogas trade journal is not accepted for publication	Likelihood without mitigation: Medium Impact: Task 1.4 will not be delivered, thus limiting the impact of this SIP. Likelihood after mitigation: Low	The editors of a number of possible journals will be consulted early in the project in order that they can be engaged in the work. The article will be planned in such a way that it is tailored towards the readership of the selected journal.	The results of the project could still be published elsewhere using a mechanism that would still be accessible to industry, for example as an online report hosted on the BBB website.
Task 2.1: The outputs of the SIP do not contribute towards CEN draft standards prEN1673-1 and prEN16723-2	Likelihood without mitigation: Medium Impact: Task 2.1 cannot be delivered, thus limiting the impact of this SIP on standardisation. Likelihood after mitigation: Low	This will be mitigated by A2.1.2 where BBB will also present the results to other standardisation committees such as ISO TC255 (Biogas) and ISO TC193 (Natural gas) if relevant.	The results of the project will be reported through other mechanisms (such as conference presentations), which may lead to uptake into standardisation activities over time.

Example: Section D2 Management risks

Risk (description)	**Likelihood and impact of occurrence**	**Mitigation** i.e. what the consortium will do to decrease the likelihood of the risk occurring	**Contingency** i.e. what the consortium will do if despite the mitigation the risk still occurs
Key personnel are lost to the project	Likelihood without mitigation: Medium Impact: The loss of key team members would create difficulties in delivering the project, or specific tasks or	Although each team member has valuable experience that is not replicated exactly by other team members, the grouping of experts within the consortium should minimise the areas where	If a key member leaves the project, then the partner concerned will be responsible for appointing a replacement. However this may still lead to a delay in

	deliverables. Likelihood after mitigation: Low	knowledge is held by a single person. All the partners will identify backups for key workers wherever possible to reduce the overall risk to the project.	delivery.
Inter-dependencies between technical activities and tasks are too complex	Likelihood without mitigation: Medium Impact: Tasks are delayed or are not possible to deliver. Likelihood after mitigation: Low	Technical meetings run by WP leaders have been scheduled to ensure proper sharing of knowledge. The interdependencies between tasks will be considered at meetings to ensure that this is addressed properly in the planning of the work. The technical WPs will be closely managed by their WP leaders to ensure that they deliver their own outputs.	In most cases, activities on the critical path have some overlap in time and thus a delay in the output of one deliverable does not necessarily cause an immediate delay in another.
Intellectual Property Rights Problems dealing with Intellectual Property (IP) ownership and/or exploitation might occur and could be a source of potential conflict	Likelihood without mitigation: Medium Impact: Disagreement between the partners could delay the progress of the project (in implementing the work and publishing results). Likelihood after mitigation: Low	All partners will sign the Grant Agreement and Consortium Agreement, which includes IP clauses.	Independent arbitrators will be used in the event of disagreement between partners.
The Linked Third Party does not deliver their key parts of the work	Likelihood without mitigation: Low Impact: Parts of the project would not be delivered effectively. Likelihood after mitigation: Very low	Under the terms of the Grant Agreement partner YYY would be liable for the relevant parts of the project if the Linked Third Party defaults.	If partner YYY also defaults on their obligations then the other partners become liable. The tasks affected would have to be reassigned or re-scoped in agreement with EURAMET.
A collaborator fails to provide access to facilities or equipment	Likelihood without mitigation: Low Impact: The consortium may not be able to complete the planned work, or the work could be delayed until another collaborator or alternative access to facilities or equipment is found. Likelihood after mitigation: Very low	All collaborators are professional organisations and experienced in working in projects. Each WP leader will work closely with each associated collaborator to report any issues back to the coordinator. Project meetings are held every 6 months, so any issues will be discussed at these meetings.	The WP leader will work with the coordinator to find an alternative collaborator or alternative access to facilities or equipment.

5.11 Section D3: Ethics

EURAMET is required by the Horizon 2020 Rules for Participation to undertake an ethics review of all EMPIR projects. This will be part of the evaluation process and there are 4 possible outcomes for a proposal following the ethics review:

1. Ethics clearance (the proposal is 'ethics ready')
2. Conditional ethics clearance (clearance is subject to conditions, i.e. ethics requirements. The requirements must either be fulfilled before grant signature or become part of the Grant Agreement)
3. Ethics Assessment recommended (i.e. the proposal raises serious and/or complex ethics issues)
4. No ethics clearance (the proposal will not be funded)

The MSU will complete Section D3 as part of the negotiation of successful proposals therefore please do not complete this section at the proposal stage.

Example 1: Section D3 Ethics

The EMPIR Ethics Review 2014 has given JRP 14RPT99 VANILLA “Ethics clearance”.

Third Countries
The consortium will ensure that any partners or collaborators from Third Countries fully adhere to H2020 ethics standards, no matter where the research is carried out. The consortium will also, in the case of dual use applications, clarify whether any export licence is required for the transfer of knowledge or material.

Data protection
The consortium will ensure that all participants in training activities and meetings give a valid informed consent for the processing of personal data.

Example 2: Section D3 Ethics

The EMPIR Ethics Review 2014 has given JRP 14IND88 MATERIALS “Conditional ethics clearance”.

Third Countries
The consortium will ensure that any partners or collaborators from Third Countries fully adhere to H2020 ethics standards, no matter where the research is carried out. The consortium will also, in the case of dual use applications, clarify whether any export licence is required for the transfer of knowledge or material.

Data protection
The consortium will ensure that all participants in training activities and meetings give a valid informed consent for the processing of personal data.

Dual use
The ethics reviewers identified that the project aims to address the strength of materials. The objectives do not have direct dual use implications but the indirect dual use risks must be monitored and addressed as the research proposed deals with the issue of "strength of materials". The idea that the ultimate strength comes from the strength of the chemical bonds which hold it together indicates that any research on this topic could have dual use implications and this must to be assessed and monitored throughout the project life time by the consortium as a contractual obligation.

The consortium will assess and report on the potential of dual use applications and, if applicable, how dual use risks can be mitigated. The report will be submitted after the grant signature, with the last technical report. As the dual use issue is an ongoing issue it will be continuously assessed during the entire course of the project.

5.12 Section E: Operational capacity

EURAMET is required by the Horizon 2020 Rules for Participation to assess the Operational capacity of all partners in a proposal to deliver EMPIR projects. This will be part of the evaluation process and carried out by the referees.

Section E asks for information on each partner in order to allow the referees to make their judgement on whether each partner has the necessary basic operational capacity to carry out their proposed activities. Therefore, for each partner, you should write a description, including key roles and contributions (usually half a page per partner) and include:

- A brief curriculum vitae or description of the profile of the organisation and persons who will be primarily responsible for carrying out the proposed research;
- A description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work;
- A list of up to five relevant previous projects or activities;
- A list of up to five relevant publications, and/or products, services (including widely-used datasets or software), or other relevant achievements;
- A description of any third parties that are not represented as project partners, but who will nonetheless be contributing towards the work (e.g. providing facilities, computing resources). This description is only required for third parties which supplement the infrastructure of a partner – it should NOT include collaborators.

For the proposed coordinator please also include evidence of their experience in managing similarly complex and large projects.

Please note that if your project is selected for funding this section will be deleted before the grant agreement is issued.

5.13 Section F: References

All references, other than those identified under the individual partners in Section E, should be listed in this section. Please only include key references.

6 Evaluation

6.1 Evaluation criteria

The evaluation criteria for proposals are described in Guide 6: Evaluating EMPIR projects. They are:

1. Excellence.
2. Impact.
3. The quality and efficiency of the implementation.

Due to the limited time EURAMET has between announcing the selection of projects and contract signature, opportunities for negotiation will be limited and therefore referees will evaluate each proposal as submitted and not on its potential if certain changes were to be made.

If the referees identify shortcomings (other than minor ones and obvious clerical errors) in the proposal, they will reflect these in a lower score for the relevant criterion.

Proposals with significant weaknesses that prevent the project from achieving its objectives or with resources being seriously over-estimated will not receive above-threshold scores.

6.2 Evaluation meetings

The evaluation of SIP proposals will take place at a consensus group meeting (see Guide 6: Evaluating EMPIR projects). Proposers are not allowed to attend a consensus group meeting.

7 Contractual requirements after selection

The Horizon 2020 Rules for Participation require EURAMET to sign Grant Agreements within 8 months of call close. The dates for the expected announcement of selection and the consequential time-frame for negotiation are given in the table of Budget and Features for the Call. If your proposal is selected for funding you will be invited to take part in negotiations; this may cover any scientific, legal or financial aspects of the proposal, based on the comments of the referees or other issues.