



Department
for Environment
Food & Rural Affairs

Pre-Tender Market Engagement

Provision for the Delivery of United Nations Economic Commission for Europe (UNECE)'s International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops (ICP Vegetation)

Date Response required: 12:00 (GMT) 23 July 2021

1 PURPOSE

This Pre-Tender Market Engagement (PTME) seeks information in preparation for the potential procurement of Suppliers for the delivery of the United Nations Economic Commission for Europe (UNECE)'s International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops (ICP Vegetation). The contract supports and helps deliver the work plan of the Convention on Long Range Transboundary Air Pollution (CLRTAP) by reviewing the state of science and analysing potential mitigation routes on the effects air pollution has on crops and on natural and semi-natural vegetation. The work supports international policy development with regards to the co-benefits of air pollution and climate change abatement policies and promotes the economic development and welfare of developing countries. Finally, the contract provides UK-specific data to assess the impacts of air quality on ecosystems as well as ongoing advice on the methodology used to fulfil the duty described in Part 5 of the NEC Regulations 2018.

The purpose of this PTME is to:

- Help define the requirement by receiving feedback on the draft specification.
- Help provide a better understanding of the market interest in the requirement.
- Understand the capacity of the market to deliver and possible risks involved.
- Provide the market with an opportunity to ask questions, raise queries and any issues to be addressed at an early stage.
- Understand the best approach.

Defra (The Authority) shall maintain commercial confidentiality of information received during the PTME.

2 DRAFT SPECIFICATION

ICP Vegetation – Market testing specification

Objectives

- To support the work of the UNECE Convention on Long Range Transboundary Air Pollution (CLRTAP) by reviewing the state of science and analysing potential mitigation routes on the effects of air pollution on crops and semi-natural vegetation.
- To implement the workplan agreed with parties to the Convention by supporting the work of ICP Vegetation. This support also provides part of the UK's contribution, in kind, to the funding of the Convention.
- To support international policy development making assessments of the co-benefits of air pollution and climate change abatement policies on crops and on natural and semi-natural vegetation.
- To promote the economic development and welfare of developing countries using outreach activities and targeted scientific analysis.
- To provide UK-specific data to assess the impacts of air quality on ecosystems and contribute in part to the UK's implementation of Part 5 of the NEC Regulations 2018.

Background

The International Cooperative Programme (ICP) on Vegetation¹ is one of 6 ICPs set up under the UNECE Convention on Long Range Transboundary Air Pollution (CLRTAP) to develop international cooperation to research and monitor the effects air pollution has on human health and the environment. There is a need for evidence on the impact air pollution has on vegetation which is used to inform international policies for emissions reduction. This need continues and has been reinforced by the requirements of the Clean Air Strategy² and National Emissions Ceilings Regulations³ (NECR) to monitor and report impacts of air pollution on habitats and ecosystems.

ICP Vegetation focusses on the impacts of ozone, nitrogen and heavy metals on both arable crops and natural and semi-natural vegetation. It was established in 1987 and has been hosted by the UK continuously via contractors since 1998. It provides part of the UK's contribution, in kind, to the funding of the Convention.

As lead country for the ICP Vegetation, the UK provides the Chair of the Task Force. It has built up widespread support from participants across Europe and beyond due to the expertise and experience of the current contractors (UK Centre for Ecology & Hydrology (UKCEH) in Bangor). Over 250 scientists from 50 countries participate in and help develop the ICP Vegetation Programme, and it has also developed links with countries from regions such as Asia and Africa to share knowledge and help reduce the impacts of air pollution.

The work of ICP Vegetation is determined by the needs of the LRTAP Convention, which are incorporated into the work plan of the Working Group on Effects (WGE); and from any specific requirements of the UK Government. The specification of work is provided below.

¹ ICP Vegetation website - <https://icpvegetation.ceh.ac.uk/>

² UK Clean Air Strategy - <https://www.gov.uk/government/publications/clean-air-strategy-2019>

³ National Emissions Ceilings Regulations - <https://www.legislation.gov.uk/uksi/2018/129/contents/made>

Aims of the ICP Vegetation

The contract supports the work of the UNECE LRTAP Convention by:

- Reviewing the state of science and analysing potential mitigation routes on the effects air pollution has on crops and on natural and semi-natural vegetation
- Implementing the Work Plan agreed by the Convention
- Supporting international policy development, e.g. by making assessments of the co-benefits of air pollution and climate change abatement policies on crops and semi-natural vegetation
- Promoting the economic development and welfare of developing countries using outreach activities and targeted scientific analysis

The current contract will expire on 31 March 2022. Defra is assessing the best route to market for the next contract, and so are testing the market to assess whether any viable competition exists. If there is a change in contractor, then Defra will need to provide one year's notice to the WGE to inform them of the change. This will also allow time for any handover arrangements.

Ozone

- To conduct coordinated experiments to determine the effects of ozone pollution on crops and (semi-)natural vegetation.
- To develop computer models to quantify and interpret the influence of climatic conditions and environmental stresses on the responses of plants to ozone, and to use these models to establish critical levels for the effects of ozone on vegetation.
- To develop maps showing where vegetation is at risk from ozone pollution within the UNECE region, including areas where critical levels are exceeded.
- To collate and review information on the impacts of ozone on crop yield (quantity and quality), including assessment of economic losses and consequences for food security.
- To collate and review information on the sensitivity of plant communities to ozone and consequences for plant biodiversity.
- To collate and review information on the effects of ozone on vegetation and carbon sequestration in a changing climate.
- To consider evidence for the modifying effects of nitrogen deposition on the impacts of ozone on (semi-)natural vegetation.

Heavy metals, nitrogen and microplastics

- To collate and review monitoring data on heavy metal, nitrogen and microplastics concentrations in mosses, a key indicator species.
- To investigate the relationship between modelled atmospheric deposition of heavy metals and nitrogen and their concentration in mosses.
- To link the moss database with other databases of metal, nitrogen and microplastics deposition.
- To facilitate knowledge transfer on the impacts of nitrogen on vegetation within the Convention.

Key findings from ICP Vegetation have included:

There is evidence of widespread ozone damage to vegetation globally. Ambient levels of ozone cause visible leaf damage, reduce crop yield, affect crop quality, and reduce the biomass of sensitive plant species.

Ozone critical levels for vegetation are regularly exceeded across many countries. Between 1990 and 2005, the metal concentration in mosses has declined for most of the metals measured. Despite these general European trends, country and region-specific temporal trends were observed, including increases in concentrations of some metal species and this work programme provided necessary context.

ICP Vegetation Specification

Work Package 1: Coordination and reporting to Defra and the LRTAP Convention

Objective 1: Disseminate to Defra, the LRTAP Convention and the public, information on the outcome of the programmes of the ICP Vegetation and organise the annual Task Force meeting.

- 1.1. Host the ICP Vegetation Programme Coordination Centre, provide the Chair of the ICP Vegetation and supporting staff for data analysis, GIS and programme administration.
- 1.2. Report results to the LRTAP Convention: results of the programme will be reported to the joint WGE–EMEP sessions in Geneva (and Executive Body on request) and will adhere to the annual cycle of reporting including contributing to the EB.AIR series⁴ of official documents.
- 1.3. Report to Defra: i) Quarterly progress reports will be provided by email and an annual report at the end of each project year together with a final report covering deliverables during the contract period, provided electronically to Defra on EVID 3 forms; ii) Quarterly telecoms with the designated Defra project officer and annual meetings with Defra representatives on request.
- 1.4. Host the ICP Vegetation website: The ICP Vegetation website⁵ will be hosted, maintained, and updated regularly with new information.
- 1.5. Organise and chair the annual Task Force Meeting, in cooperation with the local host. The minutes of the meeting will be disseminated to Defra, the secretariat of the LRTAP Convention, the participants and will be made available on the ICP Vegetation website. A book of abstracts will be published on the ICP Vegetation website.
- 1.6. Attend LRTAP Convention meetings, including Task Force meetings, workshops or conferences organised by other Convention bodies and organise joint workshops when needed.
- 1.7. Liaise with other bodies within the LRTAP Convention and the EU, including as advisors to the ecosystem monitoring subgroup of the National Emission Ceilings Directive (NECD).

Work Package 2: Improvement and application of risk assessment methodologies for ozone, including support to ODA countries and provide support to review of empirical nitrogen critical loads

Objective 2: Further improve and apply the LRTAP Convention's ozone risk assessment methodologies, including support for the review of the amended Gothenburg Protocol and EU

⁴ EB.AIR official documents - <https://unece.org/decisions>

⁵ ICP Vegetation website - <http://icpvegetation.ceh.ac.uk>

NEC Directive, and provide support to ODA countries with application of ozone risk assessment methodologies.

- 2.1. Editorial responsibility for Chapter 3 of the LRTAP Convention's Modelling and Mapping Manual (Mapping critical levels for vegetation) and its scientific background documents (SBD-A: supplementary information for Chapter 3; SBD-B: developing areas).
- 2.2. Application of flux-based ozone risk assessment methodologies to provide ozone risk assessments for vegetation for amended Gothenburg Protocol scenarios, in collaboration with EMEP/MSC-West and TFIAM/CIAM (Task Force/Centre for Integrated Assessment Modelling).
- 2.3. Ozone flux maps in soil limited areas (e.g. Mediterranean) in collaboration with EMEP/MSC-West.
- 2.4. Support application of photosynthesis-based ozone flux model DO3SE in EMEP atmospheric chemistry transport model, in collaboration with EMEP/MSC-West.
- 2.5. Provide support to ODA countries with application of ozone flux-based risk assessment methodologies with the aim of developing local and/or regional maps of potential impacts.
- 2.6. Support the implementation of flux-based methodologies in a follow-up of the Tropospheric Ozone Assessment Report (TOAR-2).
- 2.7. Contribute to review of empirical critical loads for nitrogen, in collaboration with the Coordination Centre for Effects (CCE) of the ICP Modelling and Mapping.

Work Package 3: Collation of evidence of negative impacts of ozone pollution on vegetation, with an emphasis on ODA countries

Objective 3: Coordinate the LRTAP Convention biomonitoring of ozone impacts on vegetation and enhance biomonitoring activities in ODA countries (e.g. ICP Vegetation-Asia).

- 3.1. Review and update the ICP Vegetation biomonitoring manual and provide support for use of the ozone leaf injury App and any updates required.
- 3.2. Collate and report new evidence of negative ozone impacts on vegetation, with an emphasis on ODA countries.
- 3.3. Provide training in selected ODA countries and stimulate stakeholder engagement in those countries through knowledge exchange activities.
- 3.4. Provide advice and support with the collection of ozone concentration data in ODA countries.

Work Package 4: Modelling and mapping the impacts of ozone on food production for a range of scenarios

Objective 4: To develop European and global maps of ozone impacts on food production applying flux-based ozone risk assessment methodologies.

- 4.1. European and global impact modelling for effects of ozone on food security, focussing on staple crops (e.g. wheat, maize, rice, soya) under various current and future air pollution and climate change scenarios.
- 4.2. Conduct a more detailed impact analysis in selected ODA countries where reliable crop production data and potential region-specific ozone flux-effect relationships are available (e.g. India and Southern Africa).
- 4.3. Contribute to an improved estimation of the benefits of decreasing ozone pollution through mitigation of global methane emissions, in collaboration with the Task Force on Hemispheric Transport of Air Pollution (TFHTAP).

- 4.4. Provide support to the incorporation of ozone damage functions in crop growth models and assess the consequences for food production, in collaboration with the Agricultural Model Intercomparison and Improvement Project (AgMIP).

Work Package 5: Quantifying deposition of air pollutants (heavy metals, nitrogen, and persistent organic pollutants – POPs) to vegetation using mosses

Objective 5: To provide field evidence of the contamination of natural vegetation with air pollutants and assess temporal trends in support of air pollution abatement policies.

- 5.1. Provide advice and support to the Moss Survey Coordination Centre in the Russian Federation regarding application of the moss survey protocol, quality control and storage of data, further dissemination of data from the 5-yearly moss survey and assessment of temporal trends, including comparisons with EMEP modelled deposition of heavy metals. The last survey took place in 2020/21
- 5.2. Provide advice and support by arranging the sampling and analysis of mosses as biomonitors of the atmospheric deposition of nitrogen, heavy metals and microplastics in line with the Moss Survey Coordination Centre's timetable and methodology.
- 5.3. Promote further extension of the moss survey in ODA countries, with a focus on Eastern Europe, Caucasus, and Asia.

Work Package 6: Quantifying and mapping the exceedance of ozone flux-based critical levels in the UK consistent with the National Emissions Ceilings Regulations (NECR) reporting

Objective 6: To identify areas at risk of ozone impacts on crops, trees and (semi-)natural vegetation in the UK.

- 6.1. Annual mapping of land areas where ozone pollution exceeds flux-based critical levels and provision of summary tables for the whole of the UK and individual countries, using the latest available emission and meteorological data.
- 6.2. Support the submission of UK data under Part 5 of the National Emissions Ceilings Regulations 2018 and contribute to discussions on improvement of the UK ecosystem monitoring network, identification of gaps and recommendations for future improvements.

Work Package 7: (15 days of staff time annually): Ad hoc for additional activities required by the LRTAP Convention and/or Defra.

- 7.1. During the lifetime of the contract, it is anticipated that new developments will occur within the LRTAP Convention that will require additional inputs from the ICP Vegetation. A contingency is included to cover these activities; each year the use of this contingency will be discussed and agreed with Defra before any work begins.

Deliverables

Date	Work Package	Deliverable	Tasks
Quarterly from July 2022	1	D1	Reporting results to Defra
Annually from March 2023	1	D2	Reporting result to LRTAP Convention
Annually by March 31 st	1	D3	Annual Task Force meeting

Date	Work Package	Deliverable	Tasks
Annually by March 31 st	1	D4	Completion of annual co-ordination and dissemination
Ongoing	2	D5	Update Chapter 3 of the LRTAP Convention's Modelling and Mapping Manual
Ongoing	2	D6	Collaborate with relevant LRTAP Convention bodies (e.g. EMEP/MSC-West and TFIAM/CIAM) to fulfil the Conventions work programme
Ongoing	2	D7	Provide support to ODA countries with application of ozone flux-based risk assessment methodologies
Ongoing	2	D8	Contribute to review of empirical critical loads for nitrogen, in collaboration with the CCE of the ICP Modelling and Mapping
Ongoing	3	D9	Review and update the ICP Vegetation biomonitoring manual and the ozone leaf injury App
Ongoing	3	D10	Support ODA countries and provide training in selected areas to stimulate stakeholder engagement and knowledge exchange of the negative impacts of ozone and mitigation.
Annually from August 2022	4	D11	Report on European and global impacts of ozone on food security under agreed current and future scenarios.
Ongoing	4	D12	Work with TFHTAP to improve the estimated benefits of decreasing ozone pollution through mitigation of global methane emissions.
Ongoing	4	D13	Work with AgMIP to support the incorporation of ozone damage functions in crop growth models and assess the consequences for food production.
Ongoing (Next survey planned for 2025/6)	5	D14	Provide advice and support to the Moss Survey Coordination Centre and assist in disseminating data. Sample and analyse mosses as appropriate.
Annually from August 2022	6	D15	Map land areas in UK where ozone pollution exceeds flux-based critical levels and provide summary tables of results.
By May 2023 and every 4 years thereafter	6	D16	Support the submission of UK data under Part 5 of the NECR and contribute to discussions on

Date	Work Package	Deliverable	Tasks
			improvement of the UK ecosystem monitoring network.
Quarterly from July 2022		D17	Provide a short report of ad hoc activities undertaken as part of the quarterly report

3 KEY DATES & TENDERING PROCESS

It is anticipated that project level procurement will start end of September / early October with the Contract expected to commence end of March 2021. These indicative dates are for information purposes only. The Authority reserve the right to amend these dates at any time, and Potential Suppliers rely on them entirely at their own risk.

4 RESPONSE

Please respond by email to David.sandel@defra.gov.uk via Contracts Finder with the following by 12:00 (GMT) 23 July 2021 (the “Response Deadline”).

- Q1 Would you be interested in bidding for this project?
- Q2 Would you be able to resource this work within the timeframes proposed?
- Q3 Is what the Authority asking for clear, if not, what improvements would you suggest?
- Q4 What, if anything, has the Authority missed or overlooked in setting out their requirement?
- Q5 Is there anything here which is irrelevant, outdated or unnecessary?
- Q6 Do you have the skillset and accreditation to undertake this work?
- Q7 What other expertise can you offer over and above the stated deliverables?
- Q8 Would you be likely to use subcontractors to deliver any of the deliverables? If so for which elements and why?

5 QUESTIONS AND CLARIFICATIONS

Potential Suppliers may raise questions or seek clarification regarding any aspect of this PTME document at any time prior to the Response Deadline. Questions must be submitted by email to David.sandel@defra.gov.uk only.

To ensure that all Potential Suppliers have equal access to information regarding this PTME exercise, responses to questions raised by Potential Suppliers will be published in a “Questions and Answers” document, which will also be circulated by email, with updates appearing at regular intervals (approximately two to three working days).

Responses to questions will not identify the originator of the question.

If a Potential Supplier wishes to ask a question or seek clarification without the question and answer being revealed, then the Potential Supplier must state this in their email and provide its justification for withholding the question and any response. If the Authority does not consider that there is sufficient justification for withholding the question and the corresponding response, the Potential Supplier will be invited to decide whether:

- the question/clarification and the response should in fact be published; or
- it wishes to withdraw the question/clarification.

6 GENERAL CONDITIONS

This PTME will help the Authority to refine the requirement and to understand the potential level of interest in the delivering requirements. It will also aid Potential Supplier's understanding of the requirements in advance of any formal competitive tender exercise.

The Authority reserves the right to change any information contained within this PTME at any time, and Potential Suppliers rely upon it entirely at their own risk.

The Authority reserves the right not to proceed with a competitive tender exercise after this PTME or to award any contract.

Any and all costs associated with the production of such a response to this PTME must be borne by the Potential Suppliers.

No down-selection of Potential Suppliers will take place as a consequence of any responses or interactions relating to this PTME.

The Authority expects that all responses to this PTME will be provided by Potential Suppliers in good faith to the best of their ability in the light of information available at the time of their response.

No information provided by a Potential Supplier in response to this PTME will be carried forward, used, or acknowledged in any way for the purpose of evaluating the Potential Supplier, in any subsequent formal procurement process.