



Specification under the UK Greenhouse Gas Inventory and Air Quality Pollutant Inventory Framework Agreement

Part of the Inventory Improvement Programme 2015

Project Title	A review of the NAEI shipping emissions methodology
Date ITT Sent	06/07/2015
Deadline for receipt of tenders	21/07/2015
Estimated contract start date	03/08/2015
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Background to the GHG Inventory and Air Quality Pollutant Inventory Improvement Programme

The overall aim of the Improvement Programme is to provide research and development projects to improve and develop the National Atmospheric Emissions Inventory (NAEI). The NAEI quantifies national emissions of a range of greenhouse gases and air quality pollutants. The key output of the NAEI is the provision of high quality and consistent assessments of temporal trends and spatial patterns of emissions for national policy and public information. This information must be reported annually as the UK Greenhouse Gas Inventory (GHGI) and the UK Air Quality Pollutant Inventory (AQPI), in order to fulfil the UK's national, European and international reporting obligations on climate change and air quality.

The Improvement Programme aims to improve our understanding and quality of historic emissions, to reduce uncertainties in the estimates, and to improve our ability to assess progress towards international and national emissions targets. Therefore work commissioned under the Improvement Programme must:

- Be able to develop and provide new methodologies and research;
- Be analytically sound and quality assured
- Accommodate amendments to reporting obligations; and
- Be able to be incorporated into the emissions database and annual reporting.



Project background

It is a number of years since the methodology underlying emissions from shipping in the NAEI was developed and a significant number of years since a review of the activity data. It is therefore now time to conduct a review of the methodology and perform updates and modifications as required. In addition there are areas of the model that require further investigation. In particular, to what extent have legislative developments impacted on the accuracy of the model? Is the scope of the current methodology appropriate or should it be revised or expanded? For example, does it allow for an adequate understanding of national/international splits in emissions? Finally does the methodology adequately address the range of vessel types and movements and hence fully capture emissions?

The underlying approach to estimating emissions from coastal shipping and fishing vessels in the NAEI is heavily based on research undertaken by Entec (2010) (note that inland waterways are calculated separately and are out of scope in this project). The Entec research focused on one specific year, 2007, and estimated fuel consumption and CO₂, NO_x, SO₂, PM and NMVOC emissions for an area 200 miles from the UK coastline (emissions for CH₄ and N₂O were not covered but are estimated within the Inventory using the fuel consumption figures derived by Entec, 2010). Emissions from vessels cruising at sea, manoeuvring and at berth in port are all incorporated.

Full details of the study can be found in Entec (2010)¹, however a brief summary will be provided here. Ship movement data (including vessel type and speed) was gathered from the Lloyds Marine Intelligence Unit (LMIU) for 2007, in conjunction with Automatic Identification System (AIS) data transmitted by vessels. Vessel types were categorised according to engine size and operation, which allowed fuel type to be inferred. The LMIU (and AIS) data was not fully comprehensive and movement and fuel consumption estimates were supplemented with DfT port statistics. With an understanding of engine type, distance travelled, speed and time spent at sea and in berth it was possible to establish the energy output of a vessel. This was then combined with a suitable emissions factor in order to estimate emissions. Emissions factors were primarily based on those provide by Entec (2010), although CH₄ and N₂O are defaults derived from EMEP/EEA 2006.

A time series of emissions was then developed, back to 1990 and forward to 2009, based on trends in vessel movements over time derived from DfT maritime statistics (and Marine Maritime Organisation statistics for fishing vessels) and incorporating assumptions regarding fuel use changes over time (for example due to legislative impacts on sulphur content). The Entec (2010) research has formed the basis of Inventory shipping emissions since, with DfT and MMO statistics continuing to be used as proxies to scale the data over time.

Project aims

¹ http://naei.defra.gov.uk/reports/reports?report_id=636



The aim of this project is to update and develop the NAEI shipping model to ensure accurate estimates of GHG and AQ emissions from shipping in UK waters, that are compliant with international reporting guidelines.

1) Data and methodology review

The project will review the current methodology to determine whether the underlying principles, assumptions and data (activity data and emissions factors) collected remain valid.

Recommendations and evidence for model development will be made and implemented as appropriate, accompanied by an updated 1990-2014 time series and a detailed description of the implications for the NAEI, including impacts on the uncertainty and robustness of emissions estimates.

2) Data collection

If the data and methodology review concludes that continued use of scaled 2007 data is no longer appropriate, then updated data will be required. In developing the new model, the costs of data updates (and their frequency) should be considered such that future model development can be achieved at relatively low cost.

3) Emissions projections

In addition to an updated method for estimating emissions and subsequent time series, it will be necessary to produce a methodology to estimate emissions projections (across the range of gases specified) up until 2035 (and an up to date set of projections).

Project specification

To satisfy the above aims, the following work must be undertaken:

a) Review the available activity data that will allow fuel consumption and emissions to be estimated for the following gases

- CO₂
- CH₄
- N₂O
- SO₂
- NO_x
- PM
- NMVOC



- b) Review the available activity data to determine if the calculation of an accurate separation of domestic and international shipping emission is possible.
- c) Review the available activity data to determine if a more comprehensive assessment of shipping activity than established in Entec (2010) is possible. Consideration should be paid in particular to:
- Vessels moving from and to the same port
 - Smaller vessel sizes
 - Shipping activity from the UK to Overseas Territories
 - Fishing by UK vessels in non-UK waters
- d) Review the emissions factors currently used within the NAEI and determine if they remain fit for purpose.
- e) Review legislative developments in recent years and determine what, if any, impacts they have had on the shipping model. Furthermore, consider legislation that will be enacted in the future to establish if the shipping model is able to be built in anticipation of these.
- f) Based on the results of exercise undertaken in the above four tasks, either update or revise the current NAEI shipping emissions methodology (using the most up to date activity data and emissions factors possible)
- g) Detail the implications for the Inventory including:
- An emissions estimate for the most recent possible year
 - How emissions have changed across the time series in terms of:
 - Absolute emissions
 - Trend
 - The change in emissions between the two most Inventory recent years
 - All of the above provided for each gas
- h) Provide a quantification of uncertainty that is consistent with the uncertainty methodologies detailed in the 2006 IPCC Inventory Guidelines. Moreover, demonstrate how the uncertainty has changed as a result of methodological developments.
- i) Ensure that any methodological developments are consistent with the 2006 IPCC Inventory guidelines and relevant CLRTAP methodologies.



j) Any model developments must be consistent with and integrate into the QA/QC procedures of the NAEI and also must adhere to DECC QA guidelines². In particular, the model must be:

- Fully documented, in accordance with DECC QA guidelines
- Ensure that model templates can be verified distinctly from model runs and both are subject to QA/QC
- Accompanied by recommendations and specifications for suitable model checks (and appropriate documentation to record this)

Note that the above applies regardless of the scope of model development. Moreover, bidders should detail how all final outputs (not just models) will be Quality Assured internally prior to submission to DECC.

k) Produce emissions projections, across the full range of gases, up to 2035. These must be accompanied by the full array of underlying data. In addition, we are interested in the possibility of developing emissions projections for specific ports (Southampton, Hull and other major ports). Please consider including such an approach in your bid, costed separately, detailing how this would be achieved.

i) The geographic scope for the above work should be that of the UNFCCC submission for the GHG Inventory. Inland waterways should not be considered.

Constraints

The review process described above may reveal the need to purchase new data for the model update/revision. If this is the case, the successful bidder must inform DECC. At this stage, a meeting will be held to determine the data purchasing costs (ideally the bid will include an estimate of data costs). Following this meeting, DECC will provide sign-off of funds, if deemed appropriate.

The successful organisation will be expected to attend an initial commencement meeting in the week beginning 3rd of August.

Expected deliverables

Any changes to the way in which emissions are calculated or presented must be explained in the National Inventory Report, submitted annually to the UNFCCC. In order to facilitate this, the project should deliver:

- An interim report detailing the proposed steps to address the above specification

² <https://www.gov.uk/government/organisations/department-of-energy-climate-change/about/procurement#analytical-modelling>



- A final report of **no more than 60 pages**, not including accompanying data. A template for the final report will be provided.
- Accompanying data and models:
 - Presented in MS Office Excel
 - Consistent with the requirements of the Inventory Agency (following liaison with them)

Timescales

The final report and deliverables should be completed by the end of December. An interim project report outlining recommendations and the approach proposed to address the above specification should be provided by the end of September.

Required meetings

Contractors will be required to attend an inception meeting in the week commencing 3rd of August and a closeout meeting at DECC once the deliverables have been finalised with the steering group. In the interim, a review meeting will be required to discuss the project team's recommendations to update or re-develop the shipping model. A decision on any purchasing of data will also be made at this point.

The project Gantt chart should include provision for fortnightly teleconferences with the DECC project manager, to report on progress.

Estimated costs

No fixed price is given for the project however as a guide, a range of £80k - £97k (maximum) is suggested. Potential data purchasing costs up to around £25,000 are envisaged (inclusive of total project costs). Bidders should note that the 'value for money' evaluation criteria will focus on costs excluding VAT.

Management

The project officer will be Steve Forden, Project Manager at The Department of Energy and Climate Change. The steering group will include Julia Sussams, GHG Inventory Manager, Alec Waterhouse, DECC Head of Modelling, Dorothy Anderson, Department of Transport Environment Statistician, David Vowles, Defra Scientific Policy Advisor in Atmosphere and Noise, and a representative from the Inventory Agency.

Proposal requirements

Your response to this ITT should be submitted by email on **no more than 10 sides of A4**, and should include the following information:

- an executive summary outlining your approach to the requirement;



- demonstration of your understanding of the work, setting out an approach to all aspects of the project requirements and specifying the resources to be used;
- the names, role, experience and qualifications of those who will be involved in providing the service and how much time they are allocated to the project;
- a Gantt chart showing the timeline of project tasks;
- a risk register outlining potential risks and mitigation;
- a proposed meeting and communication plan for the project; and
- a summary of project costs, broken down by relevant consultant role and day rate, shown on an invoice table (template shown in Annex 1 at the end of this specification)

Proposals should be submitted to Steve Forden (stephen.forden@decc.gsi.gov.uk), GHG Inventory Team by no later than **5pm** on the date stated above for receipt of tenders

Evaluation criteria

Tenders will be evaluated according to the following criteria and associated weighting:

Criteria	Weighting
Understanding of project requirements <ul style="list-style-type: none">• Appreciation of project background and context• Understanding of overarching aims of project• Appropriate list of actions to address the specification	25%
Skills and knowledge <ul style="list-style-type: none">• Experience in reporting against and complying with IPCC Reporting Guidelines for Inventories• Knowledge and understanding of relevant shipping data• Experience in estimating GHG and air quality emissions from shipping• Experience in estimating and reporting uncertainty in emissions.• Experience in developing emissions projections.	25%
Delivery plan	20%



<ul style="list-style-type: none">• Appropriate seniority of staff undertaking work tasks• Realistic number of days assigned to each work task• Evidence of contingency planning	
Value for money <ul style="list-style-type: none">• Tenders ranked in price order	30%

Other information

Freedom of Information and Transparency

The Freedom of Information Act 2000 (“FOIA”) and the Environmental Information Regulations 2004 (“EIR”) apply to the Department. You should be aware of the Department’s obligations and responsibilities under FOIA or EIR to disclose, on written request, recorded information held by the Department. Information provided in connection with this procurement exercise, or with any contract that may be awarded as a result of this exercise, may therefore have to be disclosed by the Department in response to such a request, unless the Department decides that one of the statutory exemptions under the FOIA or the exceptions in the EIR applies. If you wish to designate information supplied as part of this response as confidential, or if you believe that its disclosure would be prejudicial to any person’s commercial interests, you must provide clear and specific detail as to the precise information involved and explain (in broad terms) what harm may result from disclosure if a request is received, and the time period applicable to that sensitivity. Such designation alone may not prevent disclosure if in the Department’s reasonable opinion publication is required by applicable legislation or Government policy or where disclosure is required by the Information Commissioner or the First-tier Tribunal (Information Rights).

We also draw your attention to the fact that when DECC award contracts we can be required, as part of Government, to publish those contracts and all related documents, including your proposal, on a designated transparency website. You need to consider this if you wish to bid for this work. We will publish all information contained in those documents unless we consider that it would be exempt under the principles of the Freedom of Information Act 2000 (FOIA). For more information upon the Government’s Transparency Policies see either of the following websites - www.gov.uk/decc or www.cabinetoffice.gov.uk.

Conflict of Interest

The Contractor shall ensure that there is no conflict of interest as to be likely to prejudice his independence and objectivity in performing the Contract and undertakes that upon becoming aware of any such conflict of interest during the performance of the Contract (whether the conflict existed before the award of the Contract or arises during its performance) he shall immediately notify the Authority in writing of the same, giving particulars of its nature and the circumstances in which it exists or arises and shall furnish such further information as the Authority may reasonably require.



Use of Sub-Contractors

Where bidders feel that additional expertise would be of benefit in the undertaking of this work the use of sub-contractors from outside the Framework Agreement is encouraged. If the project is to involve more than one supplier, DECC would require the supplier on the Framework Agreement to be the lead contractor and be responsible for the full project and contract management of the work. Any additional suppliers would be expected to be sub-contracted by the lead supplier. The tender should clearly show one designated partner to be the project lead through whom all correspondence including all financial transactions will be directed.

Intellectual Property

Subject to any pre-existing rights of third parties and of the Contractor, the Intellectual Property Rights (other than copyright) in all reports, documents and other materials which are generated or acquired by the Contractor (or any of its sub-contractors or agents) in the performance of the Services shall belong to DECC.

Amendments to the Tender Documents by the Department

The Department reserves the right to amend the enclosed tender documents at any time prior to the deadline for receipt of tenders. Any such amendment will be numbered, dated and issued by 10th July 2015. Where amendments are significant, the Department may at its discretion extend the deadline for receipt of tenders.

The Department reserves the right to discontinue this tendering process at any time and not to award a contract.

Confidentiality

For the purposes of confidentiality you must not:

- Tell anyone else what your tender price is or will be, before the time limit for delivery of tenders.
- Try to obtain any information about anyone else's tender or proposed tender before the time limit for delivery of tenders.
- Make any arrangements with another organisation about whether or not they should tender, or about their or your tender price.

Failure to comply with these conditions may disqualify your tender.

Expenses

Please include all anticipated expenses in the proposed invoice schedule required as part of this tender.



Annex 1

Example Invoice Schedule required with Proposal.

Part A – Staff/project team charges

<u>Professional Grade/ Level</u>	<u>Role Description</u>	<u>Daily rate (ex VAT)</u>	<u>No. days offered over course of contract</u>	<u>Total price offered per staff member</u>
		£		£
		£		£
		£		£
		£		£
Sub-total				£

Notes:

- 1) Tenderers should include sub-contractors.

Part B – Non-staff/project team charges

<u>Item</u>	<u>No. of items</u>	<u>Price per item (ex VAT)</u>	<u>Total price per offered</u>
		£	£
		£	£
		£	£
Sub-total			£

Part C – Full price offered

Sub-total (Part A + Part B)	£
VAT	£
TOTAL (Sub-total + VAT)	£