**European Commission Ref. 070201/2014/693666/FRA/ENV.C.3 Service Agreement 7:
Continued improvements of inventory methodologies**

**Task 2.2: Non-Road Mobile Machinery (NRMM)**

**Task lead: Chris Dore, Aether**

**Consultation paper for discussion**

1. **Context**

Ricardo-AEA Ltd, Aether Ltd and AMEC have been commissioned to investigate and propose improvements to inventory methodologies in a number of key areas identified by the Task Force on Emission Inventories and Projections (TFEIP) and other bodies. The European Commission, as part of a collaborative initiative, has provided funding for this project, which is expected to be the focus of discussion at the TFEIP meeting and workshops in May 2015.

Task 2.2 of this project is entitled “Non-road Mobile Machinery: Improved Methodologies”. This paper sets out our initial views on the delivery of this task, and is intended to form the basis of discussions with TFEIP Expert Panel Leaders, TFEIP members, and other stakeholders.

1. **The issue(s) to be addressed**

**Scope:** The objective for this task is to develop “real world” emission factors for NRMM including all non-road mobile sources included (diesel and petrol machinery). It is recognised that real world emission factors can significantly differ from emission limit values.

Emission factors will be compiled for both historic years, and future years where information is available (e.g. future stages of EU emission regulation).

Currently the Guidebook includes Tier 1, 2 and 3 approaches. However there are aspects of each which require development, and/or updating:

**Tier 1:** Tier 1 emission factors will benefit from a general review to ensure that they are still representative of the machinery in general use. This should be done after the update of the tier 2 methodology.

**Tier 2:** The previous Guidebook update did not have the resources to include EFs after 2010.

EFs are currently included for the following EU emission “stages” or standards: <1981, 1981-1990, 1991-Pre-Stage I, Stage I, Stage II and Stage IIIA. Information on emission limit values to be achieved by NRMM entering into use in future will be included in the scope of the project.

Work is therefore needed to add the technologies for stage IIIB (2011 – 2013) and stage IV (2014/2015).

Importantly the Guidebook provides default information on the percentage make-up of the different stages of a machinery type for any one year. This allows the total fuel consumption for a machinery type in any one year to be allocated to machinery of different emission standards. These will also need to be generated for EFs from 2010 onwards.

**Tier 3:[[1]](#footnote-1)** Due to resource constraints, the last Guidebook update did not update the Tier 3 methodology. This resulted in some inconsistencies being introduced into the Guidebook between the current Tier 1 and 2 approaches and Tier 3 approach.

Furthermore, some updates are now required:

* The Stage III EFs included in the Guidebook now need to be resolved into the Stage IIIA and Stage IIIB EFs to reflect the emission standards that have been implemented.
* EFs for Stage IV (2014-2015) also need to be added.

**Tier 0:** It is also recognised that it can be challenging to obtain fuel data (or other activity data) for non-road mobile machinery. Hence developing emission “indicators” would be of particular value e.g. emissions per unit area of garden, or emissions per unit area of forest managed. For convenience, this is referred to here as a Tier 0 methodology, but will be presented in the Guidebook as “indicators”.

1. **Proposed approach**

The overall approach for this work will be to obtain the most detailed data at the outset (primarily for the Tier 3 methodology).

These detailed EFs can then be combined with fleet information from the more detailed national emission inventories (and other usage or sales studies), to allow the most appropriate aggregation of the EFs for incorporation into the Tier 2 and Tier 1 methodologies. If possible, Tier 0 emission factors will also be generated.

* A literature search will be conducted. This is expected to return information from peer reviewed papers, however the grey literature will be searched to the extent practical.
* The approach adopted by IIASA in developing its emission database for NRMM will be reviewed.
* The UN/ECE Task Force on Measurement and Modelling will also be approached for information on emissions measurements from these types of NRMM.
* A shortlist of national inventory compilers will be contacted through the TFEIP communication channels, to obtain information specific to the national emission inventory studies.
* Trade associations will be approached in an effort to obtain information on machinery sales and typical usage.
* Representatives from US emissions inventory team will also be contacted, and US-EPA42 methodology documents will be reviewed, to see whether there is any best practice which can be used in Europe.
* Other sources of information are also likely to become apparent throughout this data gathering stage of the task.
1. **Key sources of data**
* EU NRMM Directive limit values (97/68/EC).
* Updated information on NRMM compiled by the Danish Inventory team (<http://www.tfeip-secretariat.org/expert-panel-on-transport-activities/>)
* A literature search will be conducted. This is expected to return information from peer reviewed papers, however the grey literature will be searched to the extent practical.
* The approach adopted by IIASA in developing its emission database for NRMM will be reviewed.
* The UN/ECE Task Force on Measurement and Modelling will also be approached for information on emissions measurements from these types of NRMM.
* A shortlist of national inventory compilers will be contacted through the TFEIP communication channels, to obtain information specific to the national emission inventory studies.
* Trade associations will be approached in an effort to obtain information on machinery sales and typical usage.
* Representatives from US emissions inventory team will also be contacted, and US-EPA42 methodology documents will be reviewed, to see whether there is any best practice which can be used in Europe.
* Other sources of information are also likely to become apparent throughout this data gathering stage of the task.
1. **Your views**

Your views are sought on the following key issues:

1. Whether the list of data sources is missing any relevant sources of information.
2. Which countries current compile the most detailed NRMM emissions inventories, and whether they hold relevant information from national studies?
3. Which countries might be able to provide data that supports the generation of Tier 0 EFs?
4. **Consultation programme**

An introductory discussion has been held with the TFEIP management group at their meeting on 11 February 2015. Consultation with TFEIP members is planned to take place during the TFEIP meeting and workshop in May 2015. Following this, the project team will develop draft methodologies and Guidebook text. This will be circulated for consultation in late 2015, working with the TFEIP Expert Panel co-chairs.

Thank you for your co-operation with this process.

Date: 24 April 2015 Version no. 03 Issue no. 03

1. As a general principal, Tier 3 methodologies are not included in the Guidebook. However, NRMM is an exception to this rule, because the information is readily available and can be used in a reasonable standardised way. [↑](#footnote-ref-1)