Services to support the update of the EMEP EEA Emission Inventory Guidebook

Task 4: Updates to small combustion sources

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Objectives

» Implementation of BC EFs
» Review of consistency – update of the chapter
» Improved description of fuel allocation
» Impact of measurement technique on PM EFs
Implementation of BC EFs

› Discussion paper elaborated and will be uploaded after TFEIP meeting
› Most data are available for biomass combustion
› For solid, liquid and gaseous fuels there are fewer datasets available in the literature
Review of consistency – updating

› Almost all EFs are not referenced
› No clear link between technology descriptions and the EF tables
› Priority: biomass > solid fuels > other fuels
› Many recent studies for biomass fired stoves/boilers
› Discussion paper not finished yet
Review of consistency – updating

Proposal for update of technologies for EF tables

- Wood stoves
  - Conventional
  - Energy efficient
  - Advanced/Eco labelled
- The category advanced fireplaces will be replaced by the category energy efficient stoves
## Link between technologies and EFs

<table>
<thead>
<tr>
<th>Table</th>
<th>Tier</th>
<th>Fuel</th>
<th>Sector</th>
<th>Technology</th>
<th>New technology name</th>
<th>Chapter 2.2 technology name</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-6</td>
<td>1</td>
<td>Biomass</td>
<td>Residential</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3-14</td>
<td>2</td>
<td>Wood</td>
<td>Residential</td>
<td>Fireplaces</td>
<td>Open fireplaces</td>
<td>Open and partly closed fireplace</td>
</tr>
<tr>
<td>3-17</td>
<td>2</td>
<td>Wood</td>
<td>Residential</td>
<td>Stoves</td>
<td>Conventional stoves</td>
<td>Closed fireplace, conventional traditional stoves, domestic cooking</td>
</tr>
<tr>
<td>3-18</td>
<td>2</td>
<td>Wood</td>
<td>Residential</td>
<td>Boilers &lt; 50 kW</td>
<td>Conventional boilers &lt; 50 kW</td>
<td>Conventional biomass boilers</td>
</tr>
<tr>
<td>3-24</td>
<td>2</td>
<td>Wood</td>
<td>Residential</td>
<td>Advanced fireplaces</td>
<td>Energy efficient stoves</td>
<td>Energy efficient conventional stoves</td>
</tr>
<tr>
<td>3-25</td>
<td>2</td>
<td>Wood</td>
<td>Residential</td>
<td>Advanced stoves</td>
<td>Advanced/eco labelled stoves and boilers</td>
<td>Advanced combustion stoves, masonry heat accumulating stoves, catalytic combustor stoves, advanced combustion boilers (and the chimney type stove)</td>
</tr>
<tr>
<td>3-26</td>
<td>2</td>
<td>Wood</td>
<td>Residential</td>
<td>Pellet stoves</td>
<td>Pellet stoves and boilers</td>
<td>Modern pellet stoves, automatic wood boilers (pellets / chips)</td>
</tr>
</tbody>
</table>
Improved description of fuel allocation

› Survey will be made of IIRs for countries using detailed fuel split in the residential sector

› If possible more information on different techniques will be incorporated in the GB, e.g.
  › Fuel use surveys
  › Energy modelling
Impact of measurement methodology (1)

- There are several different methods available for measuring PM emissions, e.g.
  - In-stack gravimetric methods (e.g. VDI2066 bl.2)
  - Out-stack gravimetric methods without dilution tunnel (e.g. SS028426)
  - Gravimetric methods with dilution tunnel (e.g. NS3058)

- The main difference is whether the measurement is carried out in the hot flue gas or after the semi-volatile compounds have condensed

- To ensure comparability between emission inventories there is a need to establish a common method for deriving emission factors
Impact of measurement methodology (2)

- Emissions measured in a dilution tunnel are 2.5-10 times higher than the solid particle emissions measured in the hot flue gas.
- A Danish test showed 4.8 times higher PM emissions when measured in a dilution tunnel compared to in-stack.

Impact of measurement methodology (3)

- The measurements carried out in a dilution tunnel best represent the actual emission of PM when the flue gas exits the chimney, whereas measurements done in the hot flue gas will neglect the contribution to the PM emission from semi volatile compounds that forms PM when the temperature decreases.

- Based on the significant difference in EFs depending on the chosen measurement method, it is proposed to add in the GB that it is not considered good practice to use EFs for small combustion installations based on in-stack measurements, since it leads to a substantial underestimation of PM emissions.
Thank you for your attention

Please send any comments/suggestions no later than June 3 2012 to Guidebook@eea.europa.eu

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