AEM web meeting
Revision of 97/68/EC
Emissions from non-road mobile machinery (NRMM) engines
The industry behind CECE

CECE: Committee for European Construction Equipment

- National associations from 13 countries
- Representing ca. 1200 companies
- 25 billion EUR turnover from Eur. production
- Approx. a 130,000 people employed
- 20% of the worldwide production

- “Constructing the Europe of Tomorrow”
- CECE represents sector interest towards European and international stakeholders
- CECE statistics, barometer
- International exhibition patronage
The Directive is about:

- **Engines** – not vehicles or machinery

- **Pollutant emissions** – gaseous (CO, NOx, HC) & particulate (PM)

- **Emission limits & type-approval procedures**

- **Wide scope of application** (engines for construction, agriculture machinery, water vessels transport, locomotives...)

Revision of 97/68/EC

Legislative timeline

- **2014**
  - Sep: Proposal for Main Legislation
  - Oct - Dec: Adoption by Commission, Publication of proposal & IA report

- **2015**
  - Jan - Dec: Adoption by Legislators

- **2016**
  - Jan: Entry into force of NRMM Regulation

- **EU Commission**
- **EU Parliament**
- **EU Council**

Start of Co-Decision procedure
Main elements of STAGE V

- Introduction dates: 2019-2020-2021
- Extension of the scope (incl. smallest and largest engines)
- Strictest limit values worldwide
- Flexibility scheme to be dropped
- No provision for replacement engines
Revision of 97/68/EC

Extension of the scope

- Land-based NRMM
  - SI - Spark-ignited (gasoline)
    - SI 0-19kW
    - SI 19-56kW
  - CI - Compression-ignited (diesel)
    - CI 0-8kW
    - CI 8-19kW
    - CI 19-37kW
    - CI 37-56kW

- Rail - Locomotives
  - >0kW

- Rail - Railcars
  - >0kW

- Inland Waterway Vessels (IWW)
  - 37-75kW
  - 75-130kW
  - 130-300kW
  - 300-1000kW
  - ≥1000kW

- Snowmobiles
  - >0kW

- All Terrain & Side-by-Side Vehicles
  - >0kW

Scope of Directive 97/68/EC
Scope extensions new NRMM proposal
## EU STAGE V PROPOSAL

Engines for NRMM – construction, agriculture, industry (NRE) (2019/2020)

<table>
<thead>
<tr>
<th>Power range (kW)</th>
<th>Engine ignition type</th>
<th>CO (g/kWh)</th>
<th>HC (g/kWh)</th>
<th>NOx (g/kWh)</th>
<th>PM mass (g/kWh)</th>
<th>PN (#/kWh)</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0&lt;P&lt;8</td>
<td>CI</td>
<td>8.0</td>
<td>(HC+NOx≤7.50)</td>
<td>0.4 (1)</td>
<td>X</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>8≤P&lt;19</td>
<td>CI</td>
<td>6.6</td>
<td>(HC+NOx≤7.50)</td>
<td>0.4</td>
<td>X</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>19≤P&lt;37</td>
<td>STAGE IIIA</td>
<td>CI</td>
<td>5.0</td>
<td>(HC+NOx≤4.70)</td>
<td>0.015</td>
<td>1x10^{12}</td>
<td>1.10</td>
</tr>
<tr>
<td>37≤P&lt;56</td>
<td>STAGE IIIB</td>
<td>CI</td>
<td>5.0</td>
<td>(HC+NOx≤4.70)</td>
<td>0.015</td>
<td>1x10^{12}</td>
<td>1.10</td>
</tr>
<tr>
<td>56≤P&lt;130</td>
<td>STAGE IV</td>
<td>all</td>
<td>5.0</td>
<td>0.19</td>
<td>0.40</td>
<td>0.015</td>
<td>X X</td>
</tr>
<tr>
<td>130≤P≤560</td>
<td>STAGE IV</td>
<td>all</td>
<td>3.5</td>
<td>0.19</td>
<td>0.40</td>
<td>0.015</td>
<td>X X</td>
</tr>
<tr>
<td>P&gt;560</td>
<td>all</td>
<td>3.5</td>
<td>0.19</td>
<td>3.50</td>
<td>0.045</td>
<td>X</td>
<td>6.00</td>
</tr>
</tbody>
</table>

1) 0.6 for hand-startable, air-cooled direct injection engines

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## EU LATEST STAGES

Engines for NRMM - construction, agriculture, industry (NRE) (2015)

<table>
<thead>
<tr>
<th>Power range (kW)</th>
<th>Engine ignition type</th>
<th>CO (g/kWh)</th>
<th>HC (g/kWh)</th>
<th>NOx (g/kWh)</th>
<th>PM mass (g/kWh)</th>
<th>PN (#/kWh)</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>19≤P&lt;37</td>
<td>STAGE IIIA</td>
<td>CI</td>
<td>5.5</td>
<td>(HC+NOx≤7.50)</td>
<td>0.6</td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td>37≤P&lt;56</td>
<td>STAGE IIIB</td>
<td>CI</td>
<td>5.0</td>
<td>(HC+NOx≤4.70)</td>
<td>0.025</td>
<td>X X</td>
<td></td>
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<tr>
<td>56≤P&lt;130</td>
<td>STAGE IV</td>
<td>all</td>
<td>5.0</td>
<td>0.19</td>
<td>0.40</td>
<td>0.025</td>
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Strictest emissions limits worldwide

Revision of 97/68/EC

03-Sep-15
Revision of 97/68/EC

Proposed transitional provisions -- key elements

- **Staggered approach**: different introduction dates for 3 sets of engines categories
- Early type approval possibility for each category (TA)
- **Transition scheme** between stages IV and V
<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>TYPE OF ENGINES INCLUDED</th>
<th>MANDATORY DATE OF APPLICATION*</th>
</tr>
</thead>
</table>
| 1\textsuperscript{st} set of engines | • Engines for mobile machinery in construction, agriculture and industry (all power ranges except $56\text{ kW} \leq P < 130\text{ kW}$)  
• Generating sets ($P > 560\text{ kW}$)  
• Terrain and side-by-side vehicles  
• Snowmobiles  
• Inland waterway vessels ($37\text{ kW} < P < 300\text{ kW}$)  
• Hand-held machinery ($P < 19\text{ kW}$)  
• Not hand-held machinery ($P < 56\text{ kW}$) | 2019                          |
| 2\textsuperscript{nd} set of engines | • Engines for mobile machinery in construction, agriculture and industry ($56\text{ kW} \leq P < 130\text{ kW}$)  
• Inland waterway vessels ($300\text{ kW} \leq P < 1000\text{ kW}$)  
• Inland waterway vessels for auxiliary purposes ($560\text{ kW} \leq P < 1000\text{ kW}$) | 2020                          |
| 3\textsuperscript{rd} set of engines | • Engines for locomotives and railcars  
• inland waterway vessels ($P > 1000\text{ kW}$)  
• inland waterway vessels for auxiliary purposes ($P > 1000\text{ kW}$) | 2021                          |

*Placing on the market
CECE’s main concerns

CECE SUPPORTS

- Emissions limits
- Staggering approach
- Introductions dates
- Early type approval

CECE ALERTS

Adoption by the end of 2015

CECE ASKS TO AMEND

- Lack of replacement engines provision
- Duration of the transition period

Revision of 97/68/EC
**Revision of 97/68/EC**

### Extension of the transition period

<table>
<thead>
<tr>
<th>Target: extension of the duration by 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Commission proposal (COM (2014)581))</td>
</tr>
</tbody>
</table>

Transition period: first 18 months following the date of the mandatory implementation of Stage V

Art.57.5 ‘...The machinery in which the transition engines are installed may continue to be placed on the market during the transition period on condition that the machine in which the transition engine is installed has a production date prior to 1 year after the start of the transition period.’

<table>
<thead>
<tr>
<th>CECE position</th>
</tr>
</thead>
<tbody>
<tr>
<td>CECE asks the legislators to extend the transition period by 6 months (placing on the market and production)</td>
</tr>
</tbody>
</table>

Justification: This extension allows all manufacturers to comply with the new requirements, given the huge product variety and diverse characteristics of the industry. The companies that do not produce their own engines are dependent on engine manufacturers and will face serious difficulties in redesigning their entire fleet to meet required Stage V introduction dates.

<table>
<thead>
<tr>
<th>State of play (September 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Comission</td>
</tr>
<tr>
<td>Not supportive</td>
</tr>
</tbody>
</table>
Replacement engines provision

Target: re-introduction of the current replacement engines provision

European Commission proposal (COM (2014)581))

The proposed regulation prevents manufacturers providing new like-for-like replacement of worn-out or damaged engines built prior to stage V.

CECE position

**CECE requests the re-introduction** of the replacement engines provision as contained in the current directive (97/68/EC):

Art. 10.1a: ‘...replacement engines, except for railcar, locomotive and inland waterway vessel propulsion engines, shall comply with the limit values that the engine to be replaced had to meet when originally placed on the market.’

Justification: Purchasing a non-road machine is a long-term investment in high-value capital equipment, therefore it is crucial to secure the potential replacement of the engine during the machine’s life.

State of play (September 2015)

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<thead>
<tr>
<th>European Commission</th>
<th>European Council</th>
<th>European Parliament</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not supportive</td>
<td>Supportive</td>
<td>tbd</td>
</tr>
</tbody>
</table>
Other elements in the discussion

- **Aligning with EURO 6 (heavy-duty vehicles) emissions levels**
  - Debated in the European Parliament

**CECE position: to stick to the EU Commission’s proposal**

On-road and non-road engines and after-treatment systems may often use the same technologies, they are however deployed in highly different circumstances. Non-road machines need to perform heavy work in a more aggressive environment. Consequently, the performance of the emission-reduction technologies may be different. This is reflected in the test cycles and the limit values chosen by the European Commission proposal.
Adding retrofitting provisions

- ‘Low emissions zones’ (LEZ) and retrofitting measures are introduced by cities across Europe to address air quality concerns
- Promoting and including retrofitting measures in the NRMM Directive is debated in the European Parliament

**CECE position: proposal is out of the scope of the regulation**

COM (2014)581 regulates the exhaust limits for new engines placed on the market and not the engines already installed in machines. If applied, retrofitting measures should always take into account the following points:

- Retrofitted machines cannot be regarded equivalent to new machines.
- Retrofitting should not be required for latest-stage machines;
- Only products and technologies in line with UN ECE regulation R132 (type-approval requirements for retrofit emission control devices (REC)) should be permitted;
- The measures should not affect the conformity of the machine.
## CECE positions papers available

<table>
<thead>
<tr>
<th>Main concerns summary</th>
<th>CECE position on the NRMM regulation (January 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision of 97/68/CE</td>
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<tr>
<th>Replacement engines</th>
<th>CECE position on replacement engines (January 2015)</th>
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<tr>
<th>Low emissions zones and retrofitting</th>
<th>CECE position on LEZ (October 2014)</th>
</tr>
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</tbody>
</table>
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