Non-Road Mobile Machinery
New Regulation (EU) 2016/1268
repealing Directive 97/68/EC

IVR Workshop
Würzburg, 1 June 2017

European Commission
DG GROW C.4 – Automotive and Mobility Industries
DG MOVE D.3 – Ports and Inland Navigation
P. Troppmann, M. Wolska
General introduction
Regulation (EU) 2016/1628
OF THE EP AND OF THE COUNCIL
of 14 September 2016
on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery (NRMM)

• It’s about
  • Engines – not vehicles, machinery or vessels!
  • Pollutant emissions – gaseous (CO, NOx, HC) & particulate (PM)!
  • Emission limits & type-approval procedures – for new engines!

• Scope of application is wide!
New NRMM proposal

Land-based NRMM

- SI – Spark-ignited (gasoline)
- CI – Compression-ignited (diesel)

- SI 0-19kW
- SI 19-56kW
- CI 0-8kW
- CI 8-19kW
- CI 19-37kW
- CI 37-56kW

Rail - Locomotives

- 0-130kW
- >130kW

Rail - Railcars

- 0-130kW
- >130kW

Inland Waterway Vessels (IWV)

- 19-37kW
- 37-75kW
- 75-130kW
- 130-300kW
- 300-1000kW
- ≥1000kW

- Auxiliaries 19-560kW
- Auxiliaries 560-1000kW
- Auxiliaries ≥1000kW

Snowmobiles

- >0kW

All Terrain & Side-by-Side Vehicles

- >0kW

Scope of Directive 97/68/EC

Scope extensions new NRMM proposal

Gen-Sets >560kW

Gen-Sets >560kW

SI 19-37kW

CI 37-56kW

>560kW

0-8kW

0-19kW

56-130kW

130-560kW

>130kW

≥1000kW

37-75kW

75-130kW

130-300kW

300-1000kW

≥1000kW

SI – Spark-ignited (gasoline)

CI – Compression-ignited (diesel)

NRS, NRS

NRE

NRE

NRE

NRE
Some key features of new NRMM Regulation

- Regulation
- "Stage V"
- Enhanced market-surveillance provisions
- Simplification of administrative procedures
- Staggered application dates for Stage V
- New transition scheme
- Use of an EU-wide database for type-approvals
- Monitoring of emissions from in-service engines
- Type-approval also for gas-fuelled engines (partial/mono)
- Eliminating "greyzones" (field testing, sep. shipment, ATEX, ...)
- Early type-approval for Stage V
Structure of new NRMM legislation

Main legislation (co-decision act)

SUPPLEMENTING REGULATION on NRMM
Delegated Act (DA)
Technica requirements
Non-Essential elements
Recitals Chapters & Articles Annexes

Supplementing Regulation on NRMM
Implementing Act (IA)
Non-Essential elements
Recitals Chapters & Articles Annexes

Supplementing Regulation on NRMM
Delegated Act (DA)
In-service monitoring
Non-Essential elements
Recitals Chapters & Articles Annexes

Supplementing legislation (non-legislative acts)

REGULATION (EU) 2016/1628 OF THE EP & COUNCIL on essential requirements

DELEGATED REGULATION (EU) 2017/654 on technical and general requirements

IMPLEMENTING REGULATION (EU) 2017/656 on administrative requirements

DELEGATED REGULATION (EU) 2017/655 on monitoring of gaseous pollutant emissions from in-service engines

European Commission
### Land-based NRMM

**(CI <56kW & Engines >56kW)**

#### Internal market, Industry, Entrepreneurship and SMEs

<table>
<thead>
<tr>
<th>CI engines &lt; 56kW &amp; Engines &gt;56kW</th>
<th>Directive 97/68</th>
<th>New NRMM proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>emissions in g/kWh</strong></td>
<td>Stage</td>
<td>CO</td>
</tr>
<tr>
<td>CI engines 0 - 8 kW</td>
<td>variable &amp; constant</td>
<td>-</td>
</tr>
<tr>
<td>CI engines 8 - 19 kW</td>
<td>variable &amp; constant</td>
<td>-</td>
</tr>
<tr>
<td>CI engines 19 - 37 kW</td>
<td>variable &amp; constant</td>
<td>IIIA</td>
</tr>
<tr>
<td>CI engines 37 - 56 kW</td>
<td>variable</td>
<td>IIIIB</td>
</tr>
<tr>
<td></td>
<td>constant</td>
<td>IIIA</td>
</tr>
<tr>
<td>Engines 56 – 130 kW</td>
<td>variable</td>
<td>IV</td>
</tr>
<tr>
<td>Engines 56-75 kW</td>
<td>constant</td>
<td>IIIA</td>
</tr>
<tr>
<td>Engines 75 – 130 kW</td>
<td>variable</td>
<td>IV</td>
</tr>
<tr>
<td>Engines 130 – 560 kW</td>
<td>constant</td>
<td>IIIA</td>
</tr>
<tr>
<td>Engines P &gt; 560 kW</td>
<td>variable &amp; constant - Gen-Sets</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>variable &amp; constant - others</td>
<td>-</td>
</tr>
</tbody>
</table>

**Scope of Directive 97/68/EC**

**Additional in new NRMM proposal**

**Limit values in line with US legislation**

**Limit values more stringent than US legislation**
### Inland Waterway Vessels (IWV)

#### Engines for IWV

<table>
<thead>
<tr>
<th>Emissions in g/kWh</th>
<th>Directive 97/68</th>
<th>IWP, IWA engines</th>
<th>Reg (EU) 2016/1628</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP &lt; 0.9</td>
<td>Cl engines 19 - 37 kW</td>
<td></td>
<td></td>
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<tr>
<td>DP 0.9 - 1.2</td>
<td>Cl engines &gt;37 kW</td>
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<tr>
<td>DP 1.2 - 2.5</td>
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<td>DP 2.5 - 5.0</td>
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<td>DP 5.0 - 15</td>
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<tr>
<td>DP 15 - 20</td>
<td>Cl engines &lt; 3300 kW</td>
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<tr>
<td>DP 20 - 25</td>
<td>Cl engines &gt; 3300 kW</td>
<td></td>
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<tr>
<td>DP 25 - 30</td>
<td></td>
<td></td>
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<tr>
<td>DP &gt; 30</td>
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</tbody>
</table>

**Stage**
- IIA
- IIIA

**Emissions in g/kWh**
- CO
- NOx
- HC
- PM
- PN

**Reg (EU) 2016/1628**
- CO
- NOx
- HC
- PM
- PN
- A

1) regulated as mobile equipment

**Limit values in line with US legislation**

**Limit values more stringent than US legislation**

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**Inland Waterway Vessels**

[Under Dir 97/68, auxiliary engines <560 kW for IWV were regulated as engines in land-based NRMM]

Scope of Directive 97/68/EC

Additional in new NRMM proposal

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**Engines for IWV**

- 19-37 kW
- 37-75 kW
- 75-130 kW
- 130-300 kW
- 300-1000 kW
- ≥1000 kW

**Auxiliaries**

- 19-560 kW
- 560-1000 kW
- ≥1000 kW

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**Diagrams and Graphs**

- Regulatory framework
- Emission standards
- Engine performance

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**Internal market, Industry, Entrepreneurship and SMEs**

- Limit values in line with US legislation
- Limit values more stringent than US legislation
Overall time schedule

New NRMM Regulation

- SI engines 19-56 kW
- CI engines <19 kW
- Engines >560 kW
- SI engines for ATV & SBS
- SI engines for snowmobiles

- SI engines <19 kW
- CI engines 19-56 kW
- Engines 130-560 kW
- Engines inland waterway vessels 19-300 kW

- Engines 56 -130 kW
- Engines inland waterway vessels >300 kW

- Engines for rail

Mandatory dates of application of Stage V – EU Type-Approval of engines

- 6 Oct 2016 - Entry into force
- 3 May 2017 - Entry into force of DA & IA
- 1 Jan 2017 - Date of application
- 1.1.2018
- 1.1.2019
- 1.1.2020
- 1.1.2021

Internal market, Industry, Entrepreneurship and SMEs
Transitional provisions

Art 58

1.1.2016

New NRMM Regulation

Date of entry into force

YEAR 1 YEAR 2 YEAR 3

YEAR 1 YEAR 2 YEAR 3

YEAR 1 YEAR 2 YEAR 3

YEAR 1 YEAR 2 YEAR 3

YEAR 1 YEAR 2 YEAR 3

Date of application

“Placing on the market of Stage V engines”

“Type Approval Stage V”

Mandatory dates of application of Stage V

Dir 97/68/EC

Repeal of Directive 97/68/EC

1.1.2017

1.1.2018

1.1.2019

1.1.2020

1.1.2021

1.1.2022

1.1.2023

1st set of engine categories

2nd set of engine categories

3rd set of engine categories

Transitional Scheme

Transitional Scheme

Transitional Scheme

DA & IA published

Art 58

Internal market, Industry, Entrepreneurship and SMEs
Points of specific interest for the Inland Waterways sector
Provisions that deserve particular attention (1)

- **Definition of engine categories** (Art 4)
  - (1), point (1)(b): NRE<560kW – alternative use in place of IWP, IWA Stage V engines
  - (1), point (5): IWP - propulsion engines for IWV + alternative use in place of IWA engines
  - (1), point (6): IWA - auxiliary engines for IWV

- **Specific obligations of OEMs on engine installation** (Art 15)

- **Monitoring of emissions of in-service engines** (Art 19)

- **Exemptions** (Art 34)
  - Export engines – only marking, no type-approval

- **Acceptance of equivalent engine type-approvals** (Art 42)
  - UNECE type-approvals, EU type-approvals for road vehicles

- **Transitional provisions on replacement engines** (Art 58)
  - NRE >19kW: Like-for-like, with time limit 20 years as of start of Stage V
  - NRE 19-560kW: in addition, emission stage must not have expired >20 years ago
  - **NB:** No replacement engine provision for IWP & IWA engines!
Provisions that deserve particular attention (3)

- **Review clauses** (Art 60)
  - By 31 Dec 2018
    - Assessment of possibilities for harmonised measures on retrofitting of emission control devices
  - By 31 Dec 2020
    - Assessment of further emission reduction potential
    - In particular, for IWP/IWA engines:
      - more stringent limits for PN – Nox
      - more stringent limits for A-factor
      - potential addition of PN limits that do not have one set
  - By 31 Dec 2025
    - Use of exemption clauses & results of monitoring of in-service engines
    - Evaluation of TA-tests with regard to real operation conditions
    - Feasibility of tests for PM emissions for in-service engine testing
Use of Euro VI engines for IWT vessels

**EURO VI engines for HDV***

Art 42 (3) of (EU) 2016/1628 + Art 16 & Annex XIII of (EU) 2017/654

**Stage V NRE engines**

Art 4(1), point (1)(b) of (EU) 2016/1628

**Stage V NRE engines <560kW**

Stage V IWP, IWA engines

Additional obligations to be fulfilled:
- Appendix 2 of Annex IV of (EU) 2017/654
- Confirmation by Technical Service

Power restriction to <560kW
Thank you

For further information