

Considerations for a Next Stage of Emission Limits for NRMM CI Engines



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Outline

- Contributions to developing new requirements for NRMM
- Importance to finalise Stage IV requirements by comitology
- Proposal for Stage V 56-560 kW variable speed engines
- Conclusion

The Euromot Approach

- Euromot members are fully committed to deliver cost effective measures to improve air quality
- Our members are focused on finalising products for Stage IV
- Amending proposals necessary for the effective type approval of Stage IV products are to be adopted as a matter of urgency by comitology

Engine Manufacturers are extensively contributing to developing new NRMM measures (I)

- New measures concerning “real-world” emissions, applicable already from Stage IIIB
 - Ensure appropriate design of emission control systems & prevent cycle beating and cycle bypass (2010/26/EC);
- Anticipated new measures concerning “real-world” emissions, applicable already from Stage IV
 - Ensure proper operation of NO_x control systems;
 - Addition of NTE check;
 - Regulatory and technical framework for in-service conformity;

Engine Manufacturers are extensively contributing to developing new NRMM measures (II)

- Amending proposals (60+) necessary for the effective completion & implementation of Stage IV, to be adopted via comitology & codecision
- Proposal to UNECE to develop a harmonised NRMM retrofit certification scheme

Evaluation of Reduction Potential

- Implementation of Stages IIIB & IV results in a very significant reduction of air pollutants emitted by NRMM
- The magnitude of Stage IIIB & IV PM mass reduction from Stage IIIA will also largely be reflected in a reduction in particle number
- Proceeding from Stage IV to Stage V will provide a much lower reduction potential than moving from Stage IIIA to Stage IIIB & IV
- In contrast, a significantly higher potential reduction is achievable by addressing the legacy fleet of existing in-service machines via a voluntary incentive-based approach

Potential Perspective of End-Users

- There will be no contribution from Stage V NRMM if the machines become unattractive for the end-user to purchase, either due to:
 - High first cost;
 - High cost of ownership; or
 - Constrained functionality;

in comparison to maintaining existing machines

Proposal for a Stage V NRMM – Scope

Introduce individually developed PM number limits for each of the following land-based variable-speed CI NRMM engine categories:

- For engines 56 to 130 kW;
- For engines 130 to 560 kW;

subject to a prior scientific study concluding that, for each category, this measure would provide a cost-effective benefit to society

Proposal for a Stage V NRMM – Indicative Introduction Dates

Variable speed land-based CI categories:

- $130 \leq \text{Max Power} < 560 \text{ kW}$

Placing on market date not before 2019
and not less than 5 years
after publication of fully developed regulatory requirements;

- $56 \leq \text{Max Power} < 130 \text{ kW}$

Placing on market date not before 2020
and not less than 5 years
after publication of fully developed regulatory requirements;

Proposal for a Stage V NRMM – How to Determine PN Limit Values

PN limit values for variable speed land-based CI engines 56 to 130 kW & 130 to 560 kW

- Shall be based upon a collaborative study between engine manufacturers and European Commission Joint Research Centre (JRC);
- Shall be determined separately for each of the two power categories proposed and for specific applications;
- Shall be measured on NRSC & NRTC cycles on the basis of the UNECE heavy duty PMP method;
- Shall not simply be copied from HD Euro VI or from Switzerland.

Proposal for a Stage V NRMM – PM and Gaseous Emissions

- Do not change PM mass limit for the sake of global harmonization
- Do not change Stage IV gaseous emissions limits, since they are close to zero and on the same level as Euro VI

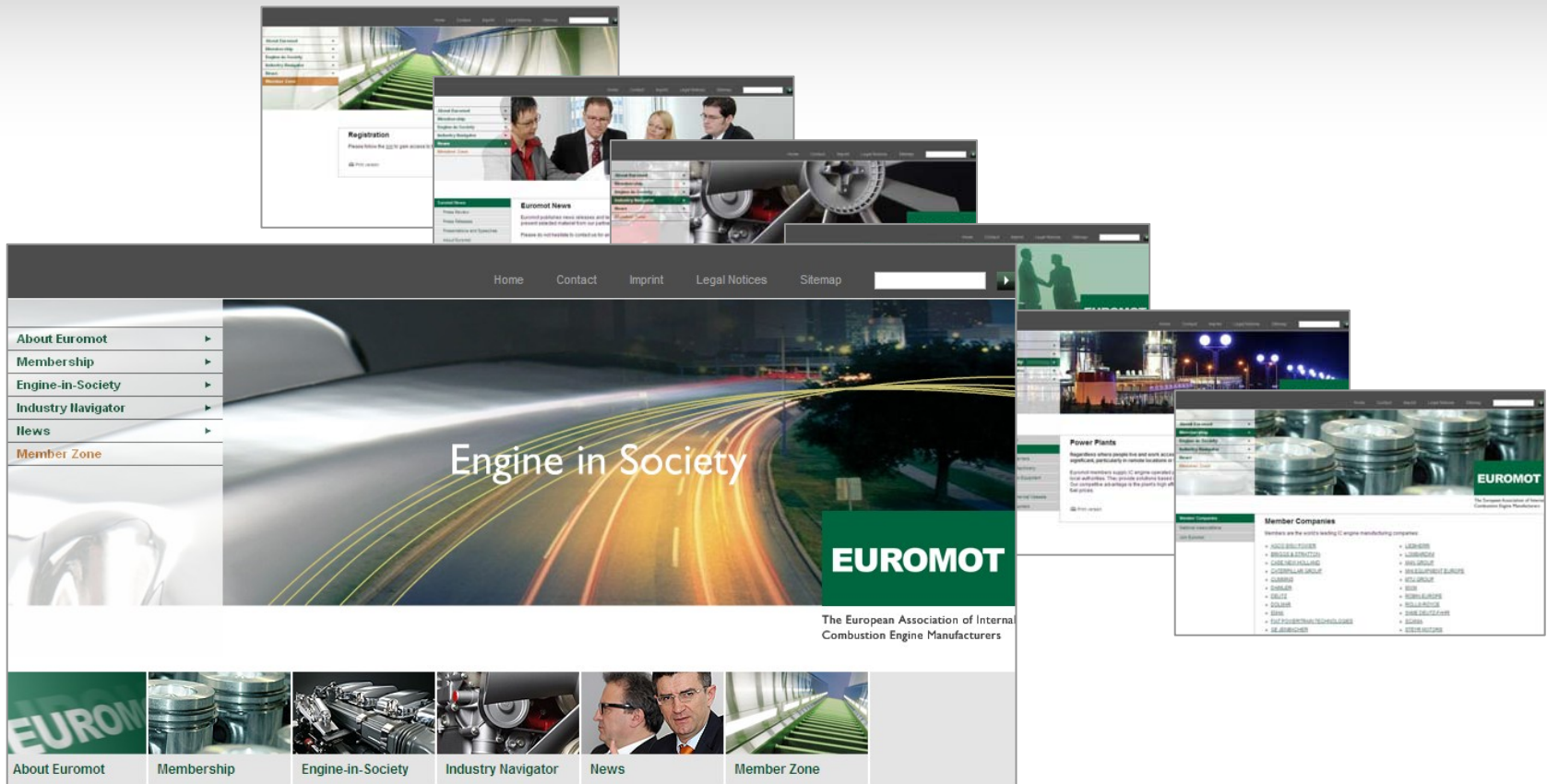
The Euromot Position for a Next Stage of Emission Limits (I)

- Amendment proposals for the type approval of Stage IV need to be adopted by Comitology by March 2012 and must not be delayed by Stage V discussions
- Stage IV is the biggest step ever towards zero emissions and largely aligns NRMM emissions with road vehicle emissions with respect to both emission level and timing

The Euromot Position for a Next Stage of Emission Limits (II)

- Euromot supports harmonised measures beyond Stage IV to further improve air quality, but only where such measures are
 - Cost-effective to society; and
 - Not based upon technical feasibility alone.
- Within that context, Euromot supports the development of a roadmap for Stage V

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