

EUROMOT

The European Association of Internal
Combustion Engine Manufacturers



Legislative Update: International Requirements

FAD-Symposium
Dresden

Dr Peter Scherm - 02 July 2010

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Membership (1)



Diesel and Gas Engine Manufacturers (CI/SI)

- AGCO SISU POWER
- CASE NEW HOLLAND
- CATERPILLAR POWER SYSTEMS
- CUMMINS ENGINES
- DAIMLER
- DEUTZ
- DRESSER WAUKESHA
- FIAT POWERTRAIN TECHNOLOGIES
- GE JENBACHER
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- JCB POWER SYSTEMS
- JOHN DEERE
- KOMATSU ENGINES
- LIEBHERR ENGINES

- LOMBARDINI
- MAN
- MHI EQUIPMENT EUROPE
- MTU FRIEDRICHSHAFEN
- MWM
- ROLLS-ROYCE
- SAME DEUTZ-FAHR
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- VOLKSWAGEN INDUSTRIAL ENGINES
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Membership (2)



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- DOLMAR
- EMAK
- GLOBAL GARDEN PRODUCTS
- HONDA EUROPE
- HUSQVARNA
- KAWASAKI EUROPE
- KOHLER ENGINES
- ROBIN EUROPE
- STIHL
- TORO EUROPE
- WACKER NEUSON
- YAMABIKO
- ZENOAH EUROPE

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- US

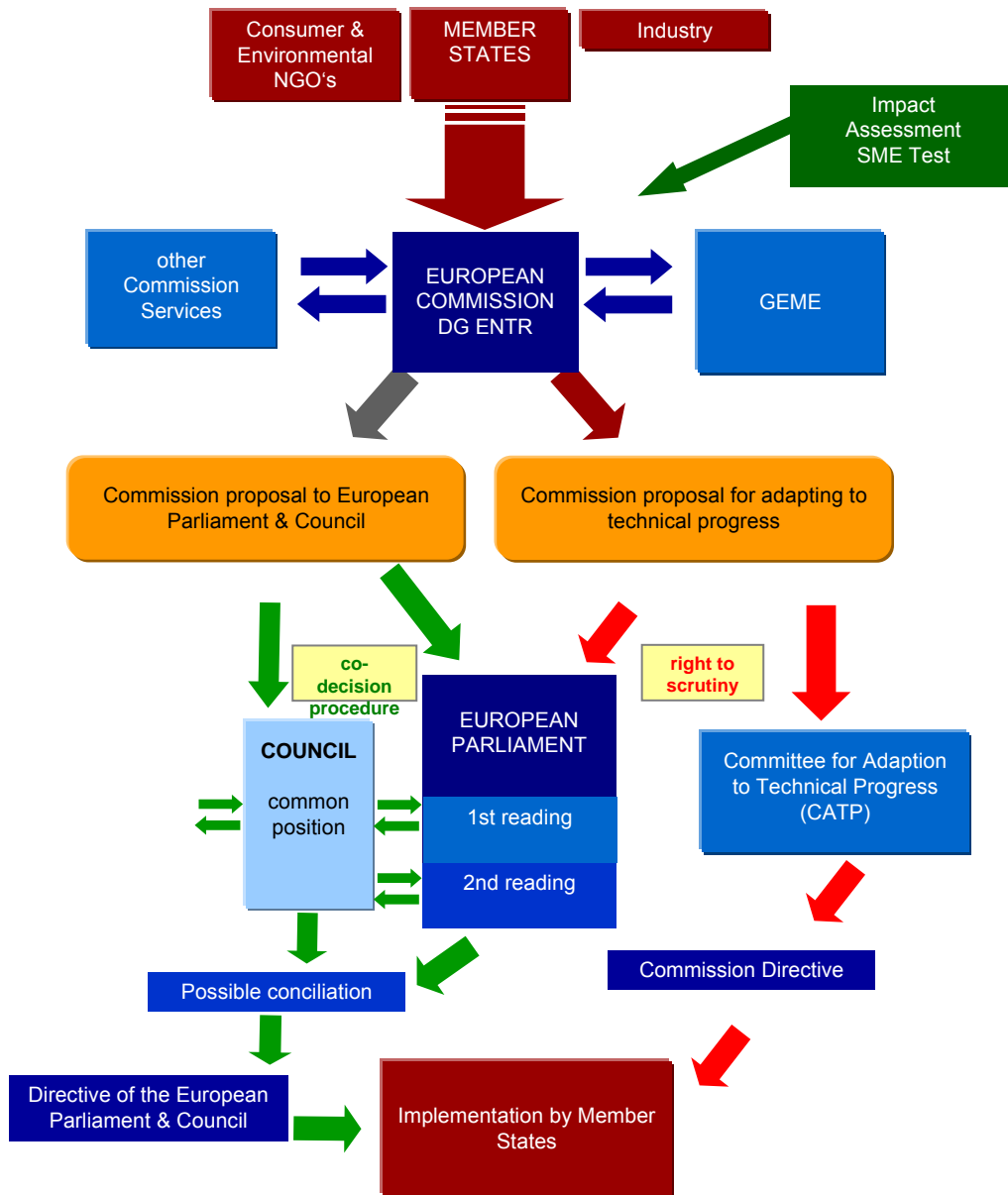
5) Approaches for Green House Gases

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REVIEW OF NRMM DIRECTIVE 97/68/EC



DEVELOPMENT OF EU REGULATIONS: PROCEDURE AND TIMELINE



	Anticipated				
	2009	2010	4	2015	2016
Publication of final report from 2007 review		?			
Publication of remaining impact assessments		?			
Policy decisions on options for regulation		?			
Completion of text produced by GEME WG		?			
Completion of text incorporating GTR		?			
Commission proposal to Parliament & Council			?		
Text agreed by Parliament & Council			?		
Text published in Official Journal (OJ)			?		
End of period of transposition into member-state law (assuming publication as Directive)			?	?	
End of 3-year minimum lead-time from publication in OJ to introduction of new stages				?	?

REVIEW OF NRMM DIRECTIVE 97/68/EC: POTENTIALLY DRIVING FORCES

- **Air quality Directive 2008/50/EC**
 - Limits on PM, NO₂, SO₂, PAH,...
 - PM10 limits from 2005: annual average concentration 40 µg/m³ and a daily concentration 50 µg/m³ which must not be exceeded more than 35 times per calendar year

- **Heavy Duty EU-VI limits**
 - Regulation (EC) No 595/2009

	Limit values							
	CO (mg/kWh)	THC (mg/kWh)	NMHC (mg/kWh)	CH ₄ (mg/kWh)	NO _x ⁽¹⁾ (mg/kWh)	NH ₃ (ppm)	PM mass (mg/kWh)	PM ⁽²⁾ number (#/kWh)
WHSC (CI)	1500	130			400	10	10	8,0 x 10 ¹¹
WHTC (CI)	4000	160			460	10	10	6,0 x 10 ¹¹
WHTC (PI)	4000		160	500	460	10	10	⁽³⁾

- ***Either* applicable from Stage IV or roadmap for future reviews**
- **New emission limits, harmonized with USEPA, for engines**
 - Const. speed: >37 kW, Stage IIIB/IV var. speed from 2018
 - 8 - 19 kW: Stage IV from 2016 (NOx 7.5, PM 0.4 g/kWh)
 - 19-37 kW: Stage IIIB/IV from 2016
 - > 560 kW: Stage IV from 2019 (NOx 3.5, PM 0.045 g/kWh)
 - Inland marine: Stage IIIB/IV from 2016 (600 kW cut-off)
- **Additional provisions**
 - Implementation of UNECE GTR no. 11 for NRMM
 - In-service conformity provisions
 - Anti-tampering measures for NOx control systems
 - Separate shipment of engine and aftertreatment systems
 - Alternative fuels

REVIEW OF NRMM DIRECTIVE 97/68/EC: ADOPTED PROVISIONS BY COMITOLGY

- **Commission Directive 2010/26/EC, amending 97/68/EC, was published on 1 April 2010**
- **May be applied immediately, but latest from 31 Mar 2011**
- **Developed in parallel to the 97/68/EC review to permit urgent technical matters for Stage IIIB type approval**
 - Missing (cold start) definitions for NRTC test
 - Steady and transient cycle tests for gaseous and PM emissions
 - Provisions for type approval of electronically controlled engines (BECS/AECS)
 - Extended documentation requirements for aftertreatment systems

LOWERING FUEL SULFUR CONTENTS

- **NRMM: 2009/30/EC for ULSD for Stage IIIB and IV**
 - Currently 1000 pm S
 - NRMM fuel (“Gas Oil”): 10 ppm Sulfur from 1 Jan 2011
 - Diesel fuel specs in Annex: Cetane, PAH, FAME (national permits >7%),...
- **Marine: IMO and 2005/33/EC**
 - IMO - SECA: 1.5 / 1.0 / 0.1 %S (up to / from 07/2010 / 2015)
 - EU - at berth/in ports
 - 0.1 % S from 2010
 - 2009/1020/EU requesting retrofit plan if not compliant

MARINE AND RAIL REGULATIONS



- **2003/44/EC on recreational crafts**
 - For CI engines >37 kW a Stage 2 proposed to be based upon US Tier 3; will require engine internal measures
 - Entry into force envisaged to be from mid of 2015

- **Inland waterway vessels (97/68/EC)**
 - Proposed emission limits with 600 kW cut-off for Stage IIIB / IV (engine internal / aftertreatment enforcing)
 - Concerns on fuel quality of 2009/30/EC: not limited to “gas oil” definition

- **Railcars and locomotives (also review of 97/68/EC)**
 - Concerns on feasibility of 2012 Stage IIIB loco limits
 - Approach for next stage of emission limits rail <560 and >560 kW: Consider US EPA (NO_x 1.8, PM 0.4 g/kWh)

INTERNATIONAL EMISSIONS REGULATIONS



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HARMONISATION WITH EU- & US- REGULATIONS:

- **EU candidate countries, transposing Directive 97/68/EC**
 - Turkey: Regulation 26588 as of Dec 2009
 - Croatia: Ordinance TPV 401 as of Nov 2008
- **Russia:** GOST 41.96-2005 for NRMM (UNECE R96 Stage 2, EU-II)
- **China:** GB 20891-2007 for NRMM engines <8 to <560 kW
 - Stage I (1 Oct 2007) and II (1 Oct 2010)
- **Japan: Special motor vehicles (9th CEC report, adopted in 2008)**
 - Stage 3 (19-560 kW) from 2011, Stage 4 (75-560 kW) from 2014
- **Other developing regulatory frameworks:**
Australia, South America,...

- **US EPA**
 - Reporting requirement for all NRMM
 - CO₂ from MY 2011, CH₄ from 2012, N₂O from 2013 (non-AT)
- **IMO regulations for seagoing ships**
 - EEDI and EEOI
- **EU**
 - Regarded a future NRMM policy issue including initial activities envisaged for end of 2010
 - Might commence compiling indicative fuel consumption data

UNECE: GLOBAL TECHNICAL REGULATIONS FOR NRMM ADOPTED

- **Internationally harmonized emission test procedures for 19-560 kW CI engines**
- **Experts group included EC, US EPA, EU and US industry, Japan, Canada and others**
- **Adopted Nov 2009 at UNECE WP.29, AC3 as gtr no. 11 under 1998 Agreement;
non-binding and non-automatic transposition into national regulations**
- **Industry aims for implementation into EU NRMM regulations**

CONCLUSIONS AND PATH FORWARD



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CONCLUSIONS AND PATH FORWARD

- **Reviewing international NRMM emission legislation**
 - Focus on EU Directive 97/68/EC
 - Addressing Stage IIIB and IV emission limits for new categories as well as additional implementation issues
- **Ongoing alignment with EU and US regulations**
- **NRMM industry strives for globally harmonized regulations to allow for “one product/technology for the global markets”**
- **CO₂ measures will be one of the challenges ahead and demonstrate again significance of internationally aligned legislation**



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