



# Newsletter

May - June 2011

## INTERNATIONAL REGULATORY DEVELOPMENTS

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## EUROPE

### First Euro VI Comitology published

The first implementing Regulation (comitology) for the heavy-duty Euro VI Regulation was published in the EU's Official Journal on 25 June 2011 as Commission Regulation (EU) No 582/2011.

The new Regulation provides much of the information and test procedures needed to enable approvals to Euro VI, but before approvals can be granted a second comitology package, which is now being developed by the Commission, will be needed to define requirements such as Repair and Maintenance Information and PMP test procedures for particulate mass and particle number.

As had been expected, the new Regulation redefines the limit values to match the world-harmonised test cycles (WHTC transient cycle and WHSC stationary cycle) that will be the only ones permitted for Euro VI. It also incorporates the particle number (PN) limits for compression ignition (CI) engines agreed with Member States. PN limits for positive ignition (PI) engines have yet to be defined.

Euro VI Emission Limits

	Limit values							
	CO (mg/kWh)	THC (mg/kWh)	NMHC (mg/kWh)	CH <sub>4</sub> (mg/kWh)	NO <sub>x</sub> (*) (mg/kWh)	NH <sub>3</sub> (ppm)	PM mass (mg/kWh)	PM (*) number (#/kWh)
WHSC (CI)	1 500	130			400	10	10	8,0 × 10 <sup>11</sup>
WHTC (CI)	4 000	160			460	10	10	6,0 × 10 <sup>11</sup>
WHTC (PI)	4 000		160	500	460	10	10	( <sup>†</sup> )

PI = Positive Ignition.  
 CI = Compression Ignition.  
 (\*) The admissible level of NO<sub>x</sub> component in the NO<sub>x</sub> limit value may be defined at a later stage.  
 (†) A new measurement procedure shall be introduced before 31 December 2012.  
 (‡) A particle number limit shall be introduced before 31 December 2012.

Emissions of engines with periodically-regenerating exhaust aftertreatment systems are measured on a weighted average of tests run during regeneration and during non-regenerating cycles. The test procedures include methodology for the measurement of ammonia emissions (Annex III, Appendix I) but references Annex 4B to ECE Regulation 49 for the majority of the test procedures.

Annexes provide details of requirements for Off-Cycle Emissions (OCE), In-Service Conformity (using Portable Emissions Measurement Systems), Conformity of Production, CO at idle for roadworthiness testing of positive ignition engines, crankcase emissions, On-Board Diagnostics (OBD) and NO<sub>x</sub> control measures, and measurement of CO<sub>2</sub> and fuel consumption.

Annex IX provides the specifications for reference fuels, covering diesel (B7; 7% biodiesel), ethanol for dedicated compression-ignition engines (ED95), petrol (E10; 10% ethanol in petrol), ethanol (E85), LPG (2 fuels of 30 ± 2% and 85 ± 2% C<sub>3</sub>), and natural gas/biomethane (3 fuels of 87% methane + 13%

ethane, 92.5% methane, and 86% methane + 14% N<sub>2</sub> respectively). If the manufacturer permits operation of the engine family on market fuels not included in the Fuel Quality Directive (98/70/EC) and EN 228 or EN 590 standards (for example running on B100), the manufacturer must declare the fuels the engine family is capable to run on; demonstrate the capability of the parent engine to meet the requirements of the Regulation on those fuels; and be liable to meet the requirements of In-Service Conformity on those fuels.

Durability distances were provided in the co-decision Regulation (EC) 595/2009 but the comitology provides details of the minimum service accumulation distances (160 000 to 233 000 km depending on vehicle type) from which the emissions at the full durability distance are extrapolated. Multiplicative or additive deterioration factors (DFs) can be used but one or the other must be used for all emissions in any one Type Approval. Multiplicative DFs must be at least 1.00 and additive DFs cannot be negative. Assigned multiplicative factors can also be used:

Test cycle	CO	THC (*)	NMHC (*)	CH <sub>4</sub> (*)	NO <sub>x</sub>	NH <sub>3</sub>	PM mass	PM number
WHTC	1,3	1,3	1,4	1,4	1,15	1,0	1,05	1,0
WHSC	1,3	1,3	1,4	1,4	1,15	1,0	1,05	1,0

(\*) Applies in case of a compression-ignition engine.  
 (†) Applies in case of a positive-ignition engine.

The Regulation also includes the provisions for Type Approval of Replacement Pollution Control Devices, which after ageing must meet the same limits as original equipment units. However, no Type Approvals can be given for replacement systems until details of the ageing procedures have been finalised.

### Publication of Euro 6 Comitology including PMP Procedures

On 16 June 2011 Commission Regulation (EU) No. 566/2011 was published in the Official Journal. This Regulation is a further amendment to the Light-duty Euro 5 and 6 Regulations. It includes the PMP procedure for particulate mass and particle number measurement (by reference to ECE Regulation 83), an updated table of test requirements, the use of daytime running lights during the emissions test, updated reference fuel specifications, and requirements for the monitoring of Diesel Particulate Filters and other OBD-related requirements as well as Repair & Maintenance Information.

The PMP procedure for particulate mass and particle number is needed to implement the Euro 5b stage, which starts on 1 September 2011 for new types and 1 January 2013 for all new vehicles, as well as for the Euro 6 stages. From stage 5b, the particulate mass limit becomes 4.5 mg/km using the new methodology (instead of 5 mg/km) and the particle number limit is 6.0 × 10<sup>11</sup>/km for CI engines.

During May and June 2011 the European Commission also held a number of stakeholder meetings on further issues related to the implementation of the light-duty Euro 6 Regulation, including revision of procedures for evaporative emissions, procedures for electric and hybrid vehicles and the assessment of 'real driving emissions'. The issue of Euro 6 particle number limits for petrol engines has also been discussed.

## **Regulation on Light Commercial Vehicle CO<sub>2</sub> Emissions published**

The finalised legislation on CO<sub>2</sub> emissions from new light commercial vehicles (LCVs) was published on 31 May 2011 as Regulation (EU) No 510/2011 and entered force on 3 June 2011.

This Regulation sets the average CO<sub>2</sub> emissions for new LCVs (category N1) at 175 g CO<sub>2</sub>/km with a target of 147 g/km for 2020, subject to confirmation of its feasibility. The Commission has to complete this feasibility review by 1 January 2013.

From 1 January 2014, each manufacturer has to ensure that its average specific emissions of CO<sub>2</sub> do not exceed a specific target based on vehicle mass. For 2014, 70% of registrations of a manufacturer's new LCVs are to be taken into account in determining the average specific emissions. This rises to 75% in 2015, 80% in 2016 and 100% from 2017 onwards.

In the period 2014 to 2017, the Regulation includes an incentive for the production of low-CO<sub>2</sub> vehicles by means of 'super credits'. Each LCV with specific CO<sub>2</sub> emissions of less than 50 g/km will count as 3.5 vehicles in 2014 and 2015, 2.5 in 2016 and 1.5 in 2017. Thereafter each counts as only 1 vehicle. These figures apply to a maximum of 25 000 LCVs per manufacturer for the duration of the scheme.

The specific CO<sub>2</sub> emissions targets are reduced by 5% for vehicles that can run on 85% bioethanol where at least 30% of the filling stations in the Member State in which the vehicle is registered can supply E85.

From 2019, the premiums for failing to achieve the average specific emissions of CO<sub>2</sub> are set at (excess emissions × €95) × number of new LCVs. For 2014 to 2018, figures are set on a sliding scale.

## **Commission launches Public Consultation on the Air Quality Review**

On 30 June 2011 DG Environment launched the public consultation on the forthcoming review of EU Air Quality legislation. The review is due to end in 2013 at the latest.

The objective of the consultation is to gather views and additional information on the effectiveness, strength and weaknesses of EU air quality legislation, in particular Directive 2008/50/EC on ambient air

quality and cleaner air for Europe and Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and PAHs in ambient air. There are two questionnaires; a short one that can be completed without prior knowledge and which is targeted at citizens with an interest in air quality, and a second longer one which requires knowledge about EU air quality legislation and its implementation and which is aimed at a range of experts and practitioners.

The consultations are available at [http://ec.europa.eu/environment/consultations/air\\_en.htm](http://ec.europa.eu/environment/consultations/air_en.htm)

## **Public Hearing on 'CARS 21'**

On 13 May 2011, the European Commission hosted a public hearing on their 'CARS 21' (Competitive Automotive Regulatory System for the 21<sup>st</sup> century) process with the aim of engaging a broader group of stakeholders into the CARS 21 topics.

Presentations were given by various Commission Services on the progress of the CARS 21 work and on the consensus documents for the CARS 21 'Sherpa' meeting to be held on 14 June 2011. Stakeholders not directly involved in the CARS 21 structure had an opportunity to provide input and ask questions. The Commission services were expecting written positions by the beginning of June 2011 in readiness for the CARS 21 Sherpa meeting.

On the basis of the input received and discussions at the upcoming Sherpa meeting, a draft interim report will be prepared and submitted for endorsement by the CARS 21 High Level Group in October 2011. Work on the remaining issues will continue in subsequent CARS 21 Working Group meetings starting in September 2011 up to June 2012.

## **European Parliament Vote on the Tractors Flexibility Proposal**

On 23 June 2011, a plenary session of the European Parliament voted on the European Commission's proposal to increase the flexibility provisions for tractors and on the amendments proposed by the Rapporteur MEP Salvatore Tatarella (EPP, Italy).

The flexibility provisions allow tractor manufacturers to place on the market a limited number of tractors which are fitted with engines that still comply with the emissions limits of the previous stage. The allowance is limited, for each engine power category, to either a maximum of 20% of the tractor manufacturer's average annual sales in the latest 5 years, or (for smaller manufacturers) a specified number of tractors. The Commission had proposed increasing the normal flexibility provisions to 50% during the transition from Stage IIIA to IIIB (until 31 December 2013), as a measure to help the industry during the economic

recession. The alternative number of engines would also be increased.

Under the compromise amendments agreed by the Parliament, the flexibility percentage would be 40%. The alternative numbers would be the same as those proposed by the Commission, ranging from 125 for engines of 130-560 kW to 250 for engines of 75-130 kW. The duration of the flexibility arrangements for the Stage IIIA to IIIB transition would be for the whole of Stage IIIB or for 3 years where there is no subsequent stage.

## **Impact Assessment on Further Steps for Constant Speed NRMM Engines**

The European Commission has released an Impact Assessment on proposals for further emissions stages in the application of the NRMM Directive to constant speed (CS) engines. Three options were considered:

- Option 0: Do nothing (baseline);
- Option 1: Harmonisation with Stage IV limits for variable speed engines but with different timescales for placing on the market (2016-2020); and
- Option 2: Harmonisation with US Tier 4 (Final) limits with different timescales (2016-2020).

For five out of the seven power bands being considered, the limits proposed under options 1 and 2 are exactly the same. However there appears to be a preference for option 2 compared with option 1 by industry in general. The report says that from the responses received, it is clear that the impacts will differ from company to company (and by power band, even within the same company).

Overall, the total cost to engine manufacturers is estimated at around €1.4 billion. The average cost per company (not counting companies already in compliance) is estimated at between €9 million and €47 million. Information from companies, however, suggests that other regulations in the 2014 - 2016 timeframe will affect the feasibility and cost.

## **Stakeholder Consultation on L-Category Vehicle Durability**

The European Commission has contracted TRL (UK) to undertake research into durability measures for L-Category vehicles (motorcycles, mopeds etc.).

The objective is to identify cost-effective durability testing measures which could be applied to a range of L-category vehicles to minimise unwanted emissions and to identify and prioritise 'harmful' tampering and recommend prevention measures. As part of this research programme, TRL is seeking the views and advice of a wide range of stakeholders via a questionnaire on L-Category vehicle durability.

## **Stakeholders' Conference on the EU Strategic Transport Technology Plan**

The European Commission invited stakeholders to a conference on the Strategic Transport Technology Plan (STTP) in Brussels on 24 May 2011. There were presentations by the Commission on the various issues to be addressed in the Plan and participants were asked to comment on the input and information that has already been collected, with the discussions being used to further develop the Plan.

The consultation process towards the STTP will come to an end by the end of June or beginning of July 2011. The internet consultation asked which technologies the STTP should focus on for the period to 2030. Options include systems for traffic management and freight optimisation, alternative fuels, and changes to vehicle design. It also asked which mechanisms should be used to encourage technology development. The Commission intends to publish a Commission Communication on the STTP in October 2011. This will outline the priorities for transport research and innovation (as well as funding organisation improvement options) to help achieve some of the goals set by the transport white paper.

## **Transport Ministers Debate on White Paper on Future Transport Policy**

The Council of the European Union held a debate on the White Paper on Transport issued by the Commission in March 2011, which outlines a roadmap allowing carbon emissions from the transport sector to be cut by 60% by 2050 with respect to 1990.

Member States generally welcomed the White Paper but, in the opinion of many delegations, the 60% reduction objective is too ambitious and should be considered an indicative target, not a binding one. Several delegations also underscored the need to adjust policy measures to tackle infrastructure disparities between different Member States. Key priorities highlighted by delegations include support to research, innovation and new technologies, the interconnection of transport networks across the Union and the creation of a homogeneous multi-modal trans-European transport network.

## **EU expected to exceed NOx Emission Ceiling, mostly due to Road Transport**

The annual status report on the National Emission Ceilings (NEC) Directive released on 1 June 2011 by the European Environment Agency (EEA) shows that while EU-27 emissions for three air pollutants are projected to meet the ceilings, NOx emissions for the EU-27 as a whole will exceed its ceiling by 17%. Ten Member States expect to miss their NOx ceilings.



EEA says that the road transport sector bears most of the blame for the anticipated exceedances, contributing to more than 40% of total EU-27 NOx emissions in 2009. Furthermore, although emissions from the sector have decreased since 1990, the reduction over the past 2 decades has not been as large as originally anticipated. This is partly because the sector has grown more than expected and partly because vehicle emissions standards have not always delivered the anticipated level of NOx reductions.

EEA Technical report No. 3/2011 is at [www.eea.europa.eu/publications/nec-directive-status-report-2010](http://www.eea.europa.eu/publications/nec-directive-status-report-2010).

## **EEA says more Efforts are needed to reduce Ozone Pollution in Europe**

A new report by the European Environment Agency (EEA) shows that despite efforts to reduce ozone pollution, in 2010 levels continued to exceed the long-term objective established in the EU. EU Member States will also face difficulties in meeting the target value, applicable as of 2010.

The new EEA report shows that the long-term objective to protect human health (maximum daily eight-hour mean concentration of 120 µg/m<sup>3</sup>) was exceeded in all EU Member States and in most of the other reporting European countries at least once during summer 2010. As in previous years, the most widespread concentrations occurred in the Mediterranean area. However, areas of western and central Europe experienced higher ozone concentrations than in 2009. For the first time in four years, in 2010 the information threshold (a one-hour average ozone concentration of 180 µg/m<sup>3</sup>) was exceeded in northern Europe.

"Air pollution by ozone across Europe during summer 2010", EEA Technical Report No. 6/2011, is at [www.eea.europa.eu/publications/air-pollution-by-ozone-across](http://www.eea.europa.eu/publications/air-pollution-by-ozone-across).

## **New European Air Pollution Maps**

New online maps published by the European Environment Agency (EEA) allow citizens to pinpoint the main diffuse sources of air pollution, such as transport and aviation. The new set of 32 maps shows where certain pollutants such as nitrogen oxides and particulate matter are released. This complements existing data on emissions from individual industrial plants from the European Pollutant Release and Transfer Register (E-PRTR). The new maps include details of PM<sub>10</sub>, NOx, CO, sulphur oxides (SOx) and ammonia on a scale of 5 km by 5 km.

The system is available at <http://prtr.ec.europa.eu/DiffuseSourcesAir.aspx>.

## **Report says Electric Vehicle Emissions should be on 'Well-to-Wheel' Basis**

In a study for the European Commission issued on 23 May 2011, Dutch consultancy CE Delft says that the EU should change its approach to regulating vehicle CO<sub>2</sub> emissions to ensure a level playing field.

The authors point out the need to avoid unfair competition with other types of greener vehicles. At the moment, the methodology used by the EU treats electric vehicles as having zero CO<sub>2</sub> emissions or gives them super-credits. This could limit the emissions reductions made across the rest of manufacturers' fleets. This approach also ignores the full environmental impact of electric cars, says CE Delft. Rather than basing regulations for new cars on tailpipe emissions, Europe should look at the well-to-wheels impacts of each form of propulsion, according to the study. It also calls for more thorough research into the relative costs and benefits of electric cars as compared to other ways of reducing emissions. The report provides an assessment of the effect of electric vehicles on 'well-to-wheel' vehicle-related NOx and PM<sub>10</sub> emissions. The report is at [www.cedelft.eu/publicatie/impact\\_of\\_electric\\_vehicles/1153](http://www.cedelft.eu/publicatie/impact_of_electric_vehicles/1153).

## **Council and Parliament reach Agreement on 'Eurovignette'**

On 23 May 2011, representatives from the European Parliament and EU governments reached agreement on the revision of the Eurovignette Directive and on 7 June 2011 the Parliament approved the proposals. The deal will allow Member States to charge lorries for the noise and air pollution they cause.

MEPs initially wanted the revised Eurovignette rules to apply to all lorries above 3.5 tonnes. Under the compromise, Member States would be allowed to exempt lorries weighing between 3.5 and 12 tonnes should they decide to apply the rules to their territories. But they would have to justify these exemptions to the European Commission. The text says all revenues from road charging should be spent on transport projects, something the Parliament's Transport Committee was very keen on. In particular, it says 15% of these revenues should go to TEN-T transport infrastructure projects.

Congestion costs are not directly covered but under the compromise agreement Member States will be able to increase the existing infrastructure charge during five peak hours a day as long as they decrease it at other times.

## European New Car CO<sub>2</sub> Emissions fell by 3.7% in 2010

A database published by the European Environment Agency on 29 June 2011 shows that average CO<sub>2</sub> emissions from new cars in the EU dropped by 3.7% in 2010, the second biggest annual fall recorded, but lower than the previous year's achievement of 5.1%.

This reduction brings the average CO<sub>2</sub> emissions of cars registered in the EU to 140 g/km. The Commission says that at this rate the European target of 130 g/km CO<sub>2</sub> will be met earlier than the 2015 deadline. The result was despite a slight increase in the average engine capacity of the cars sold in 2010 compared to 2009 and a "considerable" increase in the average weight of cars after the sharp decrease seen in 2009. Weights are now back at the level seen in the years prior to the economic crisis. However, average CO<sub>2</sub> emissions per kilometre travelled were cut thanks to improved vehicle technology and fuel efficiency.

The EEA data files are available at [www.eea.europa.eu/data-and-maps/data/co2-cars-emission](http://www.eea.europa.eu/data-and-maps/data/co2-cars-emission).

## EU Greenhouse Gas Emissions fell by 7% in 2009

The European Environment Agency (EEA) has released the final figures for EU greenhouse gas emissions in 2009, confirming a sharp decrease.

Greenhouse gas emissions decreased by 7.1% in the EU-27 and 6.9% in the EU-15. EEA says the decrease was largely the result of the economic recession of 2009, but also sustained strong growth in renewable energy. Consumption of fossil fuels fell compared to the previous year, mainly for coal, which in turn led to even steeper emissions reductions. In relative terms, the largest emissions reductions occurred in manufacturing industries and construction, and in public electricity and heat supply. There was also a strong growth in renewable energy deployment, leading to a significant increase in the share of renewables in final energy in the EU.

EEAs Technical Report No. 2/2011 is available at [www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2011](http://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2011).

## European Court condemns Sweden for PM<sub>10</sub> Breaches

The European Court of Justice (ECJ) has condemned Sweden for having exceeded EU air quality limits on PM<sub>10</sub> for several years in three areas including Stockholm and Gothenburg. Sweden has said it will take additional measures to comply. The pollution is restricted to large roads with heavy traffic in a number

of urban areas and is mainly due to the use of winter tyres, according to Sweden.

The Commission has launched court actions on PM<sub>10</sub> against several other countries.

## Commission takes France to Court over PM<sub>10</sub> Exceedances

The European Commission announced on 19 May 2011 that it will take action in the European Court of Justice to force France to implement the European Directive on ambient PM<sub>10</sub> air quality. Sixteen areas in France remain over the limits imposed by EU regulations that came into force in 2005. These include Bordeaux, Paris, Marseille, Lyon, and Lille. After receiving a 'reasoned opinion' on the issue France had asked for a time delay for these regions, but the Commission has said that only Strasbourg met the criteria.

## 10 Member States asked to comply with Green Vehicle Procurement Rules

The European Commission has requested Austria, Bulgaria, Estonia, Greece, Ireland, Luxembourg, Slovenia, Slovakia, Sweden and the United Kingdom to implement a Directive on promoting clean and energy-efficient vehicles, for which the deadline was 4 December 2010. The request takes the form of a reasoned opinion under EU infringement procedures. If the Member States fail to inform the Commission within two months of measures taken to ensure compliance, the Commission could refer the cases to the European Court of Justice.

Directive 2009/33 requires the public sector to use its purchasing power to promote clean and energy-efficient vehicles. Every time they purchase a vehicle for public transport services, they must take into account energy consumption, CO<sub>2</sub> emissions and pollutant emissions over the vehicle's whole lifetime. The obligation extends to all purchases of road transport vehicles by public authorities or by transport operators charged with public service obligations.

## Spanish Activities on Periodic Inspections and EV Subsidies

Speaking on 17 May 2011 at a Barcelona conference on air quality, senior Spanish Environment Ministry official Maj-Britt Larka said that including tests on NO<sub>2</sub> and PM<sub>10</sub> in periodic vehicle inspections would help tackle excessive levels of these pollutants in major cities by obliging owners to improve maintenance preventing these emissions from rising as vehicles become older. If approved, the measure would be included in a national air quality improvement plan due to be published in July 2011.

To promote electric vehicle purchases, Spain's Council of Ministers has approved a royal decree that will allow the Ministry of Industry, Tourism, and Commerce to provide €72 million in direct subsidies up to the end of November 2011. These funds will subsidize up to 25% (maximum €6 000) of the pre-tax value of a purchased vehicle. The purchase of electric buses or trucks may bring maximum subsidies of €15 000 and €30 000 per vehicle, depending on the specifics of the vehicle.

## **UK Consultation on NO<sub>2</sub> Air Quality Plans**

The UK's environment department (DEFRA) has launched a consultation on a package of updated draft air quality plans that aim to meet the EU limit values for NO<sub>2</sub> in England. There will be separate consultations by the devolved administrations in Scotland, Wales and Northern Ireland. DEFRA says these plans will form the basis of the UK notification to the European Commission for additional time to comply with the NO<sub>2</sub> limit values.

The published draft plans set out current and planned actions to meet the NO<sub>2</sub> limit values in 40 of the UK's 43 air quality zones where the assessment shows that one or more of the limit values are exceeded. DEFRA says the plans show that improvements have been made, with emission of NO<sub>x</sub> down by 39% between 2000 and 2009, and that 95% of UK roads assessed are currently expected to meet the NO<sub>2</sub> limits by 2015.

DEFRA's statement says that more new and cleaner vehicles are expected to bring further air quality benefits and the draft plans set out work underway to explore how to accelerate these benefits. The facilitation of Low Emission Zones (LEZs) is being considered but this is not included in the consultation as work assessing their effectiveness and feasibility is still ongoing.

The consultation is at [www.defra.gov.uk/consult/2011/06/09/air-quality](http://www.defra.gov.uk/consult/2011/06/09/air-quality).

## **London Action Plan for PM<sub>10</sub> released**

Details of additional action in London to reduce PM<sub>10</sub> have been finalised and will shortly be sent to the European Commission.

The UK's environment department (DEFRA) applied for an extension to the deadline for meeting PM<sub>10</sub> air quality limits for London and in March 2011 the European Commission granted the extension, subject to taking localised or short term actions to reduce the risk of exceedances in 2011, and updating the London air quality plan for PM<sub>10</sub> by 11 June. This update is now available via the DEFRA website at: [www.archive.defra.gov.uk/environment/quality/air/airquality/docs/air-qual-plan-london.pdf](http://www.archive.defra.gov.uk/environment/quality/air/airquality/docs/air-qual-plan-london.pdf).

## **Retrofits for the Scottish Capital**

Lothian Buses, based in Edinburgh, Scotland, is to invest £250 000 (€280 000) to retrofit a further 35 buses with combined deNO<sub>x</sub> and particulate filter systems before the end of the year.

The retrofits will be funded equally by the company and the Scottish government under their Bus Retrofitting Fund. Ten buses in the Scottish capital were fitted with the system last year, leading to a reduction in NO<sub>x</sub> emissions of over 1.7 tonnes in the last year, the company says.

## **UK Parliament launches Inquiry into Air Quality**

The Environmental Audit Select Committee of the UK Parliament's House of Commons has launched a new inquiry into air quality in the UK, to assess progress since the Committee's previous report in March 2010.

The inquiry will examine the latest scientific evidence about the health effects of poor air quality and environmental damage that air pollution causes, including Government research. The Committee invited organisations and members of the public to submit written evidence (by 3 June 2011), on the following issues:

- The causes of PM and NO<sub>2</sub> air pollution in the UK and how these can be reduced most effectively;
- The impacts on health/environment from PM and NO<sub>2</sub> pollution, and how they should be measured;
- The effectiveness of the Government's strategy for improving particulate and NO<sub>2</sub> air quality, and how that might be improved;
- The potential effects of the Government's 'localism agenda' and proposed reforms of public health provisions on local authorities' capacity for tackling poor air quality.

## **UK Report on GHG Emissions from Inland Waterways and Recreational Craft**

The UK's Department for Environment, Food and Rural Affairs has published a new report on Greenhouse Gas (GHG) Emissions from Inland Waterways and Recreational Craft in the UK.

The approach used by AEA provides estimates of population and usage of each type of vessel. This led to an estimate of the amount of each fuel consumed by the inland waterways sector and GHG emissions of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O from each vessel category and vessels on the inland waterways as a whole.

The report, prepared by AEA Technology, is part of the UK's Greenhouse Gas Inventory Improvement Programme and is available at [http://uk-air.defra.gov.uk/reports/cat07/1106231031\\_IP\\_Task\\_25\\_Inl\\_and\\_Waterways\\_Issue\\_1.pdf](http://uk-air.defra.gov.uk/reports/cat07/1106231031_IP_Task_25_Inl_and_Waterways_Issue_1.pdf).

## **Particulate Filters fitted to Lake Zürich Ships**

The General Navigation Company of Lake Zürich (ZSG) has announced that it has now equipped all the motor vessels in its fleet with particulate filters. The measure is part of the strategy of the Zurich Transport Association ZVV to provide more energy efficient and environmentally friendly transport.

Since August 2010, particulate filters have been mandatory for all new ships and, wherever feasible and economically viable for the existing fleet. ZSG decided five years ago to equip its entire fleet of 15 boats with particulate filters and the final one, the "Zimmerberg" is now in service.

The material costs for the equipment of vessels amounted to around 1.3 million Swiss francs. Installation takes up to 20 working days per ship.

## **Russian Refinery starts Production of Euro 5 Fuel**

Russia's Lukoil announced on 16 May 2011 that their Nizhny Novgorod Oil Refinery has launched production of gasoline meeting Euro 5 (10 ppm sulfur) emissions standards.

## **NORTH AMERICA**

### **Review of Vehicle Regulations by US-EPA**

As part of its preliminary plan for the review of existing regulations announced on 26 May 2011, the US Environmental Protection Agency (EPA) aims to review existing vehicle regulations for areas where greater harmonisation can be achieved with California and the US Department of Transportation (DOT). This will include greenhouse gas and fuel-economy standards and fuel economy label harmonisation. Other issues for review include vehicle fuel vapour recovery systems and fuel producers' reporting and recordkeeping. EPA also intends to explore technologies and practices that could reduce emissions of multiple pollutants.

### **US-EPA issues Proposals for Revised Guidance on SCR**

The US Environmental Protection Agency (EPA) has issued a proposal for comment giving revised guidance on Certification Requirements for Heavy-Duty Diesel Engines using Selective Catalytic Reduction (SCR) Technology.

The proposed text stems from the joint ARB/EPA workshop on this subject held in California last year following lawsuits from Navistar which claimed that EPA had adopted them without the required public process and had relied only on input from the SCR engine makers.

In the Federal Register publication, EPA reviews issues including ensuring the availability and use of SCR reductant meeting the required specifications. Based on a number of studies, EPA reports that SCR systems are highly effective in actual use, driver SCR-related warning signals work correctly, and drivers do not wait for SCR-related inducements to be triggered to ensure appropriate and continuing operation of the SCR system.

The document provides guidance on tank level warning systems, low reductant level inducement systems, detection of reagent quality, and tamper resistant designs.

The proposal is available in the Federal Register at [www.gpo.gov/fdsys/pkg/FR-2011-06-07/pdf/2011-13851.pdf](http://www.gpo.gov/fdsys/pkg/FR-2011-06-07/pdf/2011-13851.pdf)

### **Enforcement of Air Pollution Rules for Vessels Operating in U.S. Waters**

The US Environmental Protection Agency (EPA) and the US Coast Guard (USCG) have announced an agreement to jointly enforce US and international (IMO) air pollution requirements for vessels operating in US waters. The most stringent requirements apply to ships operating within 200 nautical miles of the coast of North America.

Under the memorandum of understanding signed by EPA and the USCG, both organisations will perform inspections and investigations, and will take appropriate enforcement actions if a violation is detected. A letter to industry was also signed by USCG and EPA to provide the regulated community with notice that USCG and EPA will be taking measures to promote compliance with federal and international air pollution requirements and will be actively pursuing violations.

### **US-EPA Initiative on Emissions from Trucks at US Ports**

The US Environmental Protection Agency (EPA) together with the Coalition for Responsible Transportation and the Environmental Defense Fund, has launched a new initiative to reduce pollution from short-haul (dray) trucks that service US ports.

Under the new SmartWay initiative dray trucks - large diesel trucks that are widely used in port facilities to haul freight from cargo ships to nearby local distribution points - carriers sign an agreement with EPA to track and reduce PM<sub>2.5</sub> emissions by 50% and NOx emissions by 25% below the industry average over a three year period. In addition, SmartWay dray shipper partners will commit to use the cleaner trucks to haul 75% or more of port freight.



## **California proposes 2-year Delay on Marine Fuels Deadline**

The California Air Resources Board (CARB) has announced that it proposes to delay the deadline for ships operating within 24 nautical miles of the Californian coast to switch to 0.1% sulfur marine gasoil or marine diesel oil (MDO). CARB proposes moving the deadline back 2 years to 1 January 2014.

The move is part of a proposal that adjusts the offshore regulatory boundary in Southern California and aims to 'recapture' emissions reductions that have been compromised by vessels moving from the traditional route through the Santa Barbara Channel (within the zone covered by the clean fuel regulation) to a route on the southern side of the Channel Islands, outside of the regulated zone. More details are at [www.arb.ca.gov/regact/2011/ogv11/ogv11.htm](http://www.arb.ca.gov/regact/2011/ogv11/ogv11.htm).

## **US-EPA announces Schedule for Air Toxics Standards for Boilers**

EPA, the US Environmental Protection Agency, has set a schedule for issuing updated air toxics standards for boilers and certain solid waste incinerators.

EPA announced it would delay the effective date of standards for major source boilers and commercial and industrial solid waste incinerators, but not the effective date of the standards for boilers located at area sources of air toxic emissions. The agency says it will now propose standards by the end of October 2011 and issue final standards by the end of April 2012. More information is at:

[www.epa.gov/airquality/combustion](http://www.epa.gov/airquality/combustion).

## **EPA announces Research Flights to Monitor Air Pollution**

The US Environmental protection Agency (EPA) has announced that with NASA it is to conduct a series of aircraft research flights over the Baltimore-Washington traffic corridor to study urban air pollution.

EPA says that NASA research satellites monitor many air pollution components, but it has been a challenge to use these measurements of the atmosphere from space to detect pollution near the ground. The campaign with NASA will help improve the capability of satellites to measure near surface-level atmospheric composition. Flights will be coordinated with extensive ground observations at various sites.

## **US EPA proposes 2012 Renewable Fuel Standards and 2013 Biodiesel**

The US Environmental Protection Agency (EPA) has proposed the 2012 percentage standards for four fuel categories that are part of the agency's Renewable Fuel Standard programme.

Each year EPA calculates a total volume of each renewable fuel to be used in the following year, together with its percentage of total fuel volume to be achieved. Each refiner, importer, and blender can then determine the minimum volume of renewable fuel that it must ensure is used in its transportation fuel.

The proposed 2012 standards are:

1.0 billion gallons of biomass-based diesel (0.91%)

2.0 billion gallons of "Advanced biofuels" (1.21%)

3.45 to 12.9 million gallons of cellulosic biofuels (equivalent to 0.002 – 0.010%)

15.2 billion gallons of total renewable fuels (9.21%)

In addition, EPA is proposing a volume requirement of 1.28 billion gallons for biomass-based diesel for 2013.

## **SOUTH AMERICA**

### **Bogota to phase out Use of 2-Stroke Engines to Reduce Pollution**

Colombia's capital Bogota will phase out the use of motorcycles and other vehicles with two-stroke engines to reduce air pollution under a resolution that took effect on 3 May 2011.

Resolution 2394, issued 25 April 2011 by the capital's Secretariats of Transit and the Environment, prohibits motorcycles and other vehicles with 2-stroke engines larger than 50 cc from circulating in the city between the hours of 6 a.m. and 10 a.m. and 5 p.m. and 8 p.m. From 1 September, 2-stroke vehicles built before 2001 will be banned from use in the city. By 1 January 2012, no 2-stroke vehicle built before 2005 may be driven in the city and from 1 July 2012, all 2-stroke vehicles will be banned from use in the capital.

The secretariats based their resolution on a study which found that 2-stroke engines generate between 5 and 15 times as much pollution as 4-stroke engines and between 15 and 100 times as much pollution as conventional automobile engines. According to the environmental secretariat, there are 39 000 two-stroke vehicles in the city. Of those, 25 000 are more than 12 years old.

### **Chile to require Particulate Plan in Two Cities**

Environment Minister Maria Ignacia Benitez has announced that the Chilean government plans to declare the southern cities of Chillán and Los Angeles "saturated zones" because of harmful levels of particulate matter in the air. This would require the government and local authorities to create a decontamination plan.

The particulate matter is largely caused by the widespread use of firewood for domestic heating as well as stubble burning and public transportation. Benitez said the ministerial decrees will be ready in

July 2011 for review and possible revision by the government regulator Contraloría General de la República. The decrees are expected to be published by the end of the year.

## ASIA PACIFIC

### Australia finalises new Light-duty Emissions Standards

On 11 June 2011, the Australian Ministry for Infrastructure and Transport finalised the next stage in their light-duty vehicle emissions standards, to be based on Euro 5 and 6.

Phase 1 of the new Australian light-duty vehicle standards begins with implementation of the 'core' standards (effectively Euro 5a requirements) on 1 November 2013, for new models of cars, 4-wheel drive and utility vehicles ("Utes"). Amongst other things, this phase excludes the PMP procedures for diesel particle number measurement and for improved particulate mass measurement, and so retains a 5 mg/km PM limit. The full Euro 5 standard, including more stringent OBD requirements and PMP procedures with a 4.5 mg/km PM limit and a particle number limit for diesels starts on 1 November 2016.

Euro 6 limits will be required for new models beginning on 1 July 2017, and for all vehicle models from 1 July 2018.

Phase & Standard	Mandatory Implementation Dates	
	New Models	All Models
Phase 1; "Core" Euro 5 (ADR79/03)	1 November 2013	Not applicable
Phase 2; Full Euro 5 (ADR79/04)	Not applicable	1 November 2016
Phase 3; Full Euro 6 (ADR79/05)	1 July 2017	1 July 2018

The implementation dates in the table apply to new vehicles in all 4-wheeled light road vehicle categories (Gross Vehicle Mass of 3.5 tonnes) and all fuel types.

Requirements for flex fuel at low temperature are to be determined by 31 December 2011.

Once ECE Reg. 83 is amended to adopt the Euro 6 emissions limits, the new ADR79/05 (Phase 3) will be published with the implementation dates indicated, unless there are unanticipated and significant changes from the current Euro 6 requirements in the EU.

The announcement of the new standards is at [www.minister.infrastructure.gov.au/aa/releases/2011/June/A0106\\_2011.htm](http://www.minister.infrastructure.gov.au/aa/releases/2011/June/A0106_2011.htm). This notes that a separate process is currently underway on the development of new CO<sub>2</sub> emission standards for introduction in 2015. The legal text of ADR79/03 and 79/04 will be posted on the Australian Federal Register of Legislative Instruments in due course.

### Beijing Clean Air Plan

Under the Clean Air Plan released by the Beijing Municipal Bureau of Environment the city hopes to increase the rate of public transportation use to 50% of all transit. New cars will have to meet China V (equivalent to Euro 5) emissions standards and non-road machinery will have to meet China III emissions standards. As reported in the previous issue of the AECC Newsletter, Beijing also aims to remove 400 000 older, higher-emission vehicles through trade-in programmes. The city also hopes to increase the use of alternative-energy vehicles and to have 5 000 such vehicles on the road as part of demonstration projects by 2012.

### China plans for New Energy Vehicle Industry and Electric Vehicle Promotion

China's Ministry of Industry and Information Technology (MIIT) announced on its official website on 22 June 2011 that it has basically completed drafting of the development planning for an energy-efficient and new energy vehicle industry. The goal is to establish a thorough energy-efficient and new energy vehicle industry chain within 10 years, with 5 million units on the roads by 2020.

Starting from 1 January 2012, China also plans to exempt electric, fuel-cell, and plug-in hybrid vehicles from its annual motor vehicle "travel tax" and to charge a reduced rate for owners of smaller combustion-engine vehicles, according to a draft regulation released by the State Council on 15 June 2011 for public comment. While owners of hybrid and electric vehicles would be exempted from the annual tax, those that own petrol- or diesel-powered automobiles with a 1.6-litre engine or smaller would be required to pay between 60 and 540 Yuan (€6-60), depending on the weight of the vehicle and engine displacement. Larger cars with 3.0 litre engines and larger would be subject to an annual tax between 2400 and 5400 Yuan (€250-560).

### Shenzhen, China, to promote Low-CO<sub>2</sub> Vehicles

Shenzhen's municipal government plans to spend 2.1 billion Yuan (€221 million) to reduce CO<sub>2</sub> emissions by offering more subsidies for individual purchases of hybrid and electric vehicles. The funding also will help to provide clean public transportation for the upcoming Universiade university sports games, pay for building charging stations, and fund a new "Low-Carbon Green Travel Card" for public transportation.

About 2000 of the 3180 vehicles to be used for public transportation during the Universiade will be "new-energy vehicles." The city's transportation fleet will

have 1370 hybrid buses, 270 all-electric buses, 300 all-electric taxis, and 62 fuel-cell powered vehicles by the start of the games. Thirty-one charging stations will be operable by that time and 200 are expected to be installed by the end of 2012 under city plans.

## **India may go to Euro 6 in 2017**

A report in the Hindustan Times says that India may opt for Euro 6 emissions levels in 2017, skipping Euro 5. Currently, Euro 4 emissions levels are applicable in 13 major cities of India and the rest of the country has Euro 3 norms. By 2012, the entire country is supposed to have uniform emission levels of Euro 4.

The report says that the introduction of the new standards depends on improvements in vehicle engine technology and the availability of cleaner fuel from petroleum companies. The government has not prescribed any roadmap for the introduction of higher emissions standards after 2012; therefore, an inter-ministerial group has been constituted to discuss future policy. In its recommendation to the committee, the Environment Ministry has said that India should directly opt for Euro 6 standards instead of Euro 5. Ministry officials told the committee that the new norms should be applicable from 2017 as that would provide enough time to automakers and petroleum companies to enhance technology to meet the new standards.

## **India to introduce Fuel Efficiency Standards**

The Indian Ministry of Road Transport and Highways is introducing new Corporate Average Fuel Economy (CAFE) standards that will become effective from 2015. The new standards will raise the fuel efficiency of petrol cars from the current average level of 14.1 km/litre (7.1 litres/100 km) to 17.3 km/litre (5.8 litres/100 km). Diesel cars will have to improve fuel efficiency from 15.5 km/litre (6.5 litres/100 km) to 19.9 km/litre (5.0 litres/100 km). Measured in terms of CO<sub>2</sub> emissions, the average 2015 standard will be 135 g/km. In 2010, the average CO<sub>2</sub> emission was 165 g/km.

## **South Korea to regulate Vehicle Greenhouse Gas Emissions**

The Environment Ministry of South Korea has announced that it will start enforcing regulations regarding greenhouse gas emissions from vehicles next year. The new regulations will begin with a goal of having all new vehicles meet the government's auto emissions standard of 140 g/km CO<sub>2</sub> by 2015.

The new regulations will apply to all domestic and imported cars carrying 10 passengers or less. The

Ministry expects to reduce CO<sub>2</sub> emissions by 12.2%, from 159 g/km in 2009, with the new law. The Ministry said in a statement, "With the regulation, a total of 3.7 million tons of carbon dioxide is expected to be reduced during the 2009-2020 period. It will also save 1.2 billion litres of gasoline, worth 2.4 trillion won (US\$2.2 billion), and 400 million litres of diesel oil, worth 720 billion won (US\$661.2 million)." The Organization for Economic Cooperation and Development (OECD) ranks South Korea as one of the biggest greenhouse gas emitters, emitting 594 million tons of CO<sub>2</sub> in 2005.

## **UNITED NATIONS**

### **Progress at GRPE and WP.29**

The UN's Working Party on Pollution and Energy (GRPE) held their 62<sup>nd</sup> session at the UN Palais des Nations in Geneva on 9 and 10 June 2011.

A corrigendum to the world-harmonised heavy test procedure (WHDC) – gtr no. 4 - was adopted by GRPE and will be sent to WP.29, the World Forum for the Harmonization of Vehicle Regulations, for approval. GRPE also adopted amendments to ECE Regulation 49 (Heavy-duty emissions) to eliminate problems discovered in the development of Euro VI. This primarily concern OBD.

A correction to gtr no.11 (tractor and NRMM emissions) was adopted for formal submission to WP.29 in November 2011. GRPE adopted a European Commission proposal for an 03 series of amendments to align ECE Reg. 96 (NRMM & Tractor emissions) with EU stages IIIB and IV. This also includes the harmonised test procedures from the gtr. An equivalent amendment to Reg.120 (power) was also adopted.

WP.29 itself met in Geneva from 21 to 24 June 2011. The amendment introducing performance standards into gtr no. 2 (WMTC; motorcycles) was unanimously adopted. It was noted that the current principal limit values might be revised in future. GRPE received a mandate to develop a new proposal amending gtr no. 5 (world-harmonised heavy-duty OBD) based on the observations made during the transposition into the 'Euro VI' Regulation.

### **UNEP Report says Action on Soot and Smog could help limit Global Warming**

A new assessment by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) issued on 14 June 2011 says that fast action on pollutants such as black carbon, ground level ozone and methane may help limit near-term global temperature rise and significantly increase the chances of keeping temperature rise below 2°C, and perhaps even 1.5°C.

The findings were released during a meeting in Bonn of the UN Framework Convention on Climate Change (UNFCCC).

The researchers however also underline the fact that while fast action on black carbon and ground level ozone could play a key role in limiting near-term climate change, immediate and sustained action to cut back CO<sub>2</sub> is crucial if temperature rise is to be limited over the long-term. It is the combination of action on short-lived climate forcers and long-lived greenhouse gases which improves the chances of keeping below the 2 degree target throughout the 21<sup>st</sup> Century.

Nine actions are pin pointed in the assessment for black carbon. Heading the list is "Diesel Particle Filters for vehicles as part of combined standards on vehicle emissions and fuels".

The summary for decision makers and full UNEP-WMO Integrated Assessment of Black Carbon and Tropospheric Ozone report can be found at [www.unep.org/dewa/Portals/67/pdf/BlackCarbon\\_SDM.pdf](http://www.unep.org/dewa/Portals/67/pdf/BlackCarbon_SDM.pdf).

## GENERAL

### FIA says Zero Emission-branded Electric Cars are 'Misleading'

Europe's biggest motoring consumer group, the FIA (Fédération Internationale de l'Automobile), has said that more transparency is urgently required for consumers on the benefits of electric vehicles.

The FIA warned that current commercial and political pressures to present battery electric vehicles as 'zero emission' vehicles "are misleading for consumers... While supporting the push towards electric vehicles, our clubs are calling for greater transparency and consistency in the carbon rating of plug-in vehicles," said FIA president Werner Kraus. The FIA also warned that the purchase price of electric vehicles is still too high to favour their rapid market uptake. Total running costs also have to be investigated and clearly presented to consumers, the organisation added.

### Emission Reduction Potential of Conventional Automotive Propulsion

According to a draft report from Boston Consulting Group (BCG) on automotive propulsion to 2020, conventional automotive technologies have significant emission-reduction potential.

Advanced combustion technologies alone could reduce CO<sub>2</sub> tailpipe emissions by 40% from current average levels for new vehicles. Engine downsizing, turbocharging, optimized cooling, low friction, start-stop systems, electric power steering, direct injection, and variable valve timing will likely lead. BCG sees fewer levers available for diesel-fuelled engines, which are already optimized.

The cost to the consumer would be about \$50 to \$60 per percent CO<sub>2</sub> reduction - roughly half the cost of what was expected three years ago. As a result, BCG concludes, the electric car faces stiff competition from internal combustion engines and, based solely on total cost of ownership economics, will not be the preferred option for most consumers. Nevertheless, BCG found that there is a green consumer segment that represents about 6% of car buyers in the US, 9% in Europe and 13% in China.

BCG also suggests that if governments switch their regulatory focus from tailpipe emissions to the broader well-to-wheel metric for judging vehicles' environmental impact, the environmental argument for EVs becomes less compelling. BCG's report 'Powering Autos to 2020' is scheduled to be released in July 2011.

## RESEARCH SUMMARY

### Effects of Emissions

#### Cancer Risk of Traffic-related Particle-bound PAHs

The purpose of this study was to assess the lung cancer risk caused by inhalation exposure to nano/ultrafine particle-bound PAHs using a human respiratory tract model linked with a physiologically based pharmacokinetic model to estimate deposition fraction and internal organic-specific PAHs doses. The authors found that 90% probability lung cancer risks ranged from 10<sup>-5</sup> to 10<sup>-4</sup> for traffic-related nano and ultrafine particle-bound PAHs, indicating a potential lung cancer risk.

**Source:** Lung Liao, Chio, Chen, Ju, Li, Cheng, Liao, Chen and Ling, Lung cancer risk in relation to traffic-related nano/ultrafine particle-bound PAHs exposure: A preliminary probabilistic assessment; *Journal of Hazardous Materials* (2011) 190 (1-3) pp.150-158, doi: [10.1016/j.jhazmat.2011.03.017](https://doi.org/10.1016/j.jhazmat.2011.03.017).

#### Childhood Leukaemia near Busy Roads

Living near busy roads is associated with an increased risk of childhood leukaemia, according to French researchers. The study found that children living within 500 metres of major roads (particularly with heavy-duty vehicles) were more likely to develop leukaemia than those who lived far from such roads. The association was stronger when the roads were 300 m and 100 m from homes. The association was found to be stronger for children who had lived at their current homes for 2 years or more, and strongest for those who had never moved home. Children exposed to high estimated levels of nitrogen dioxide (above 16.2 µg/m<sup>3</sup>) were more likely to develop leukaemia.

**Source:** Amigou et al., Road Traffic and Childhood Leukaemia: The ESCALE Study (SFCE); *Environmental Health Perspectives* (2011) 119 (4), pp.566-572, doi:[10.1289/ehp.1002429](https://doi.org/10.1289/ehp.1002429).



## Particulate Exposure and Cardiovascular Mechanisms

Traffic related particulate matter air pollution is a risk factor for cardiovascular events; however, the biological mechanisms are unclear. The authors of this paper show that exposure to diesel exhaust increases iNOS (inducible nitric oxide synthase) expression and activity. Up-regulation of iNOS is known to contribute to vascular dysfunction, progression of atherosclerosis and ultimately cardiovascular morbidity and mortality, so this could ultimately lead to urban air pollution-associated cardiovascular morbidity and mortality.

**Source:** Bai, Kido, Kavanagh, Kaufman, Rosenfeld, van Breemen and van Eeden, Exposure to diesel exhaust up-regulates iNOS expression in ApoE knockout mice; *Toxicology and Applied Pharmacology* (2011, in press), [doi:10.1016/j.taap.2011.06.013](https://doi.org/10.1016/j.taap.2011.06.013).

## Association between Air Pollution and Asthma

The objective of this study was to assess the association between long-term exposure to NO<sub>2</sub>, O<sub>3</sub> and PM<sub>10</sub> and asthma control in the follow-up of the Epidemiological study on the Genetics and Environment of Asthma (EGEA2). The results suggest that long-term exposure to PM<sub>10</sub> and O<sub>3</sub> is associated with uncontrolled asthma in adults, defined by symptoms, exacerbations and lung function.

**Source:** Jacquemin et al, Air pollution and asthma control in the Epidemiological study on the Genetics and Environment of Asthma; *Journal of Epidemiology and Community Health* (2011) <http://press.psprings.co.uk/jech/june/jech130229.pdf>, [doi:10.1136/jech.2010.130229](https://doi.org/10.1136/jech.2010.130229).

## PM Exposure and Inflammatory Disorders of the Gut

In this study mice were exposed to a very high dose of urban PM from Washington, DC and small bowel and colonic tissue were harvested for histologic evaluation. The authors conclude that exposure to high doses of urban PM causes oxidant dependent gastro-intestinal epithelial cell death, disruption of tight junction proteins, inflammation and increased permeability in the gut in vitro and in vivo. These PM-induced changes may contribute to exacerbations of inflammatory disorders of the gut.

**Source:** Mutlu et al, Particulate matter air pollution causes oxidant-mediated increase in gut permeability in mice; *Particle and Fibre Toxicology* (2011) 8 (19), [doi:10.1186/1743-8977-8-19](https://doi.org/10.1186/1743-8977-8-19).

## Effect of Emissions Legislation on Mortality Rates

The authors of this study evaluated the effect of a diesel emission control law on mortality rates in 23 wards of Tokyo metropolitan area, Japan. Air pollutants were positively associated with circulatory and pulmonary disease mortality, especially cerebrovascular disease. Rate ratios were attenuated after the enforcement in most of the outcomes, probably due to reduced toxicity of the pollutants. In the crude interrupted time-series analysis, reductions of standardized mortality rates after the enforcement were the greatest in high traffic areas. Even after

adjustment of longer-time trend, mortality rate from cerebrovascular disease was reduced by 8.50% with dose-response relationship. However, the declines in other cause-specific mortality became equivocal.

**Source:** Yorifuji, Kawachi, Kaneda, Takao, Kashima and Doi, Diesel vehicle emission and death rates in Tokyo, Japan: A natural experiment; *Science of The Total Environment* (2011, in press), [doi:10.1016/j.scitotenv.2011.06.002](https://doi.org/10.1016/j.scitotenv.2011.06.002).

## Assessment of Sources and Exposure

### Global Emissions Projections of On-Road PM

In this paper the authors present global emission projections of primary particulate matter (PM) from exhaust of on-road vehicles under four commonly-used global fuel use scenarios from 2010 to 2050. The projections are based on a dynamic model which incorporates more details on the technology stock than previous models, including the vehicle type and age, and the number of "super-emitters".

**Source:** Fang Yan, Ekborderin Winijkul, Soonkyu Jung, Tami C. Bond and David G. Streets, Global emission projections of particulate matter (PM): I. Exhaust emissions from on-road vehicles; *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.06.018](https://doi.org/10.1016/j.atmosenv.2011.06.018).

### Analysis of PM<sub>2.5</sub> Sources in the Netherlands

The Netherlands is considered one of the hotspot areas in Europe with high concentrations of particulate matter (PM) and may not be able to meet all standards for PM<sub>2.5</sub> in time with current legislation. To improve understanding of the composition, distribution and origin of PM<sub>2.5</sub> in the ambient air an intensive one-year measurement campaign was performed at five locations in the Netherlands. The five sites consist of three rural background sites, one urban background site and one kerbside site. On the five locations secondary inorganic aerosol (SIA) is responsible for the largest contribution to PM<sub>2.5</sub>. The largest contribution of the traffic and re-suspended road dust profile was found at the kerbside site.

**Source:** Mooibroek, Schaap, Weijers and Hoogerbrugge, Source apportionment and spatial variability of PM<sub>2.5</sub> using measurements at five sites in the Netherlands; *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.05.017](https://doi.org/10.1016/j.atmosenv.2011.05.017).

### Contribution of Road Traffic to Air Pollution in Prague

This paper reports on two measurement campaigns near busy freeway and suburban crossroads with different traffic intensity carried out in Prague, Czech Republic. Both were supported with simultaneous measurements at a suburban background site to compare measured values with the corresponding city background. An extensive set of instrumentation was used to monitor aerosol particle number size distribution, mass size distribution and chemical composition of size resolved aerosol samples.

Results showed that the main contribution of traffic in ultrafine size range can be attributed to direct exhaust

emissions, while the coarse fraction was dominated mainly by regional background aerosol with small traces of brake and tyre abrasion as well as the re-suspension of the road dust.

**Source:** Ondráček, Schwarz, Ždímal, Andělová, Vodička, Bizek, Tsai, C. Chen and Smolík, Contribution of the road traffic to air pollution in the Prague city (busy speedway and suburban crossroads); *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.06.036](https://doi.org/10.1016/j.atmosenv.2011.06.036).

### Ultrafine Particles due to Ship Emissions

Two years of experimental data on particle number ( $\geq 2.5$  nm diameter) and black carbon concentrations and of gaseous pollutants recorded in the ambient air of a coastal city were analysed in order to assess the impact of ship emissions on the ultrafine particles (UFPs, diameter  $< 100$  nm) in urban ambient air.

Vehicle exhausts resulted in high concentrations of UFP, black carbon and NO<sub>x</sub> during the early morning, when UFPs showed concentrations of  $15\text{-}30 \times 10^3/\text{cc}$ . Pollutants linked to this source rapidly decreased when inland sea breeze started to flow. However, this airflow resulted in inland transport of ship plumes (emitted in the harbour and in the sea) into the city and in high concentrations of SO<sub>2</sub>, NO<sub>x</sub> and UFP from mid-morning to the evening. In this context, UFPs showed concentrations  $35\text{-}50 \times 10^3/\text{cc}$ , with 65-70% of these linked to ship emissions mostly related to SO<sub>2</sub>.

**Source:** González, Rodríguez, Guerra García, Trujillo and García, Ultrafine particles pollution in urban coastal air due to ship emissions; *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.06.002](https://doi.org/10.1016/j.atmosenv.2011.06.002).

### Particle Concentrations inside Auto-Rickshaws

In this paper the authors report results from 180 hours of real-time measurements of fine particle and black carbon mass concentration (PM<sub>2.5</sub>, BC) and ultrafine particle number concentration (PN) inside auto-rickshaws in New Delhi, India. The authors estimate that exposure during a daily commute by auto-rickshaw in Delhi is as least as large as full-day exposures experienced by urban residents of many high-income countries.

**Source:** Apte et al, Concentrations of fine, ultrafine, and black carbon particles in auto-rickshaws in New Delhi, India; *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.05.028](https://doi.org/10.1016/j.atmosenv.2011.05.028)

### Sources of Road Dust Particles

This study investigates the spatial and chemical properties of the emission source road dust particles below  $10 \mu\text{m}$  in three contrasting European urban environments. Four main sources were found to drive the variability of road dust particles  $< 10 \mu\text{m}$ : mineral (road wear and urban dust generated mostly by construction emissions), motor exhaust, brake wear and tyre wear.

**Source:** Amato et al, Sources and variability of inhalable road dust particles in three European cities; *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.06](https://doi.org/10.1016/j.atmosenv.2011.06).

## Air Quality

### Fine Particle Concentrations in Urban Environments

This research provides an exploratory examination of the factors associated with fine particle concentrations in intersection and sidewalk microenvironments in five study areas in the Los Angeles region. The study areas range from low-density, auto-oriented development patterns to dense urban areas with mid- and high-rise buildings. Average concentrations of fine particles ranged from about  $20\text{-}70 \mu\text{g}/\text{m}^3$ . A regression analysis shows that concentrations are associated with traffic and the proximate built environment.

**Source:** Boarnet et al., Fine Particulate Concentrations on Sidewalks in Five Southern California Cities; *Atmospheric Environment* (2011) 45 (24) pp.4025-4033, [doi:10.1016/j.atmosenv.2011.04.047](https://doi.org/10.1016/j.atmosenv.2011.04.047).

### Assessment of Air Pollution in Syria

This paper reviews, collates and synthesises the results of numerous studies of Syrian road transport, with an emphasis on air pollution from Syria's transport and energy production sectors. It is revealed that those studies that have been done show that the air quality in Syrian urban areas falls below established national air quality standards, especially during winter when the demand for heating is high. The paper proposes a number of suggestions to improve air quality in Syria.

**Source:** Almasri, Muneer, and Cullinane, The effect of transport on air quality in urban areas of Syria; *Energy Policy* (2011) 39 (6) pp.3605-3611, [doi:10.1016/j.enpol.2011.03.062](https://doi.org/10.1016/j.enpol.2011.03.062).

### Vehicle Emissions Factors in 22 Chinese Cities

The authors of this paper examine vehicle emissions in 22 Chinese cities of different types and locations. Vehicle emission factors of the cities differ by 50 to 90% due to distinct local features and vehicle technology levels. Each vehicle type contributes differently to total emissions among the cities. The authors say that a substantial increase in vehicle emissions in most Chinese cities is foreseeable unless stronger measures are implemented because the benefit of current policies can be quickly offset by the vehicle growth.

**Source:** Hong Huo et al, Modeling vehicle emissions in different types of Chinese cities: Importance of vehicle fleet and local features; *Environmental Pollution* (2011, in press), [doi:10.1016/j.envpol.2011.04.025](https://doi.org/10.1016/j.envpol.2011.04.025).

## Engine Development and Emissions Measurement

### Oxidation Catalysts for Natural Gas Buses

This paper discusses the performance of heavy-duty natural gas transit buses retrofitted with economic oxidation formulation oxidation catalysts in reducing regulated and unregulated emissions.

The regulated emissions exhibited a 99% reduction in emissions of CP, a 62% reduction in emissions of hydrocarbons with the presence of the oxidation catalyst, and a 96% decrease in carbonyl compound emissions. The catalyst formulation effectively targeted the lower chain volatile hydrocarbon fraction in the exhaust, which generally requires high light-off temperatures. Overall, the catalyst produced a 93% reduction in emissions of volatile organic compounds and was effective in reducing PAH emissions by 46%.

Source: Thiruvengadam, Carder, Krishnamurthy, Oshinuga and Gautam, Effect of an economical oxidation catalyst formulation on regulated and unregulated pollutants from natural gas fueled heavy duty transit buses; *Transportation Research Part D: Transport and Environment* (2011) 16 (6) pp.469-473, [doi:10.1016/j.trd.2011.04.003](https://doi.org/10.1016/j.trd.2011.04.003).

### Dutch Report on Truck NOx Emissions

In this paper, emissions measurements for heavy-duty vehicles in the Euro V (and Euro III) emissions categories were carried out under typical Dutch driving conditions. The results revealed that real-world NOx emissions from these trucks are significantly higher than was previously estimated based on the reduction steps in the Euro emission standards. Emission levels were higher, by about a factor of 3, in city streets, and 10 to 40% higher along motorways.

The authors say that these higher emission levels resulted in higher estimated national NOx emissions, increasing from 250 kt to 264 kt, compared with the national emission ceiling of 260 kt to be adhered to by 2010. The higher emissions more than double the total road length with possible exceedances of the NO<sub>2</sub> limit value; from about 100 km to about 250 km along cities streets and motorways, by 2015.

Source: Velders, Geilenkirchen and de Lange, Higher than expected NOx emission from trucks may affect attainability of NO<sub>2</sub> limit values in the Netherlands; *Atmospheric Environment* (2011) 45 (18) pp.3025-3033 <http://dx.doi.org/10.1016/j.atmosenv.2011.03.023>.

### Emissions of US 2007 HD Engines

As part of the Advanced Collaborative Emissions Study (ACES), regulated and unregulated exhaust emissions from four different US 2007 model year heavy-duty diesel engines were measured. The engines were equipped with catalysed diesel particulate filters.

Regulated emissions of CO, NMHC, and PM were on average 97, 89, and 86% lower than the 2007 EPA standard, respectively, and oxides of nitrogen (NOx) were on average 9% lower. Unregulated exhaust emissions of NO<sub>2</sub> were on average 1.3 and 2.8 times higher than the NO<sub>2</sub> emissions reported in previous work using 1998- and 2004-technology engines, respectively. Average emission reductions in the range of 71-99% were observed for a very comprehensive list of unregulated engine exhaust

pollutants and air toxics. On average, when combining engine operation with and without active regeneration events, particle number emissions with the 2007 engines were 90% lower than the particle number emitted from a 2004-technology engine tested in an earlier programme.

Source: Khalek, Bougher, Merritt and Zielinska, Regulated and unregulated emissions from highway heavy-duty diesel engines complying with U.S. Environmental Protection Agency 2007 emissions standards; *Journal of the Air and Waste Management Association*, (2011) 61 (4) pp.427-42.

### Life Cycle Assessment of Tractor Retrofits

This study provides a Life Cycle Assessment (LCA) of aftertreatment options to reduce emissions from older tractors: no retrofit (baseline); a diesel oxidation catalyst (DOC)/diesel particulate filter (DPF) system; and a selective catalytic reduction (SCR) catalytic converter. Two vehicle usage patterns were considered, one following the legal test cycle (used for all off-road vehicles) and one corresponding to average agricultural tractor usage.

All assessment methods gave the SCR catalytic converter a better value than the DOC/DPF system. The DOC/DPF system decreased the impact on human health, while the SCR catalytic converter decreased the acidification and eutrophication impact. Both catalytic converters increased abiotic resource consumption substantially.

Source: Larsson and Hansson, Environmental impact of catalytic converters and particle filters for agricultural tractors determined by life cycle assessment; *Biosystems Engineering* (2011) 109 (1) pp.15-21, [doi:10.1016/j.biosystemseng.2011.01.010](https://doi.org/10.1016/j.biosystemseng.2011.01.010).

### Emissions from Off-Road Diesels with Different Fuels

This study compared Swedish Environmental Class 1 diesel (EC1) with the Fischer-Tropsch diesel fuel Ecopar™ in terms of emissions under varied conditions (steady state, controlled transients and realistic work operations) in order to identify factors influencing emissions in actual operation.

Using F-T diesel reduced emissions of aromatic hydrocarbons, but not alkenes. Emissions were equally dependent on work operation character (load, engine speed, occurrence of transients) for both fuels. There were indications that the emissions originated from unburnt fuel, rather than from combustion products.

Source: Lindgren, Arrhenius, Larsson, Bäfver, Arvidsson, Wetterberg, Hansson and Rosell, Analysis of unregulated emissions from an off-road diesel engine during realistic work operations; *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.06.046](https://doi.org/10.1016/j.atmosenv.2011.06.046).

### Korean Heavy-duty PMP Test Results

This study was conducted as part of the UNECE PMP ILCE of the Korea Particulate Measurement Programme over European and worldwide harmonised heavy-duty test cycles using the



Mercedes OM501 heavy-duty 'golden engine' with DPF.

Real-time particle formation on the ETC and WHTC were strongly correlated with engine operating conditions and aftertreatment device temperature. The higher particle number concentration during the ESC #7 to #10 modes was ascribed to passive DPF regeneration and the thermal release of low volatile particles at high exhaust temperature conditions. The detailed average particle number concentration reached approximately  $4.8 \times 10^{11}/\text{kWh}$  (weighted WHTC),  $6.1 \times 10^{10}/\text{kWh}$  (WHSC),  $4.6 \times 10^{10}/\text{kWh}$  (ETC), and  $3.4 \times 10^{12}/\text{kWh}$  (ESC). Particle masses ranged from 1.1 mg/kWh (WHSC) to 3.1 mg/kWh (ESC). The particle number concentration and mass reduction of DPF reached about 99%, except for an ESC with a reduction of 95%.

**Source:** Myung, Kim, Kwon, Choi, Ko and Park, Nano-particle emission characteristics of European and Worldwide Harmonized test cycles for heavy-duty diesel engines; *International Journal of Automotive Technology* (2011) 12 (3) pp. 331-337, [doi:10.1007/s12239-011-0039-3](https://doi.org/10.1007/s12239-011-0039-3).

## Characterisation of Particulate

### PM Size Distributions of Large Diesels

This paper addresses particulate size distributions in large-scale diesel engine exhaust. The test engines were multivariable large-scale turbo-charged, after-cooled medium speed (~500 rpm, ~1 MW per cylinder) direct injection diesel engines.

Emissions measurements were carried out while burning heavy fuel (HFO) and light fuel (LFO) oils. Test modes for investigation were propulsion mode (marine) and generator mode (power plant), with load varying from 25 to 100%. PM was measured using a gravimetric impactor with four impactor stages plus a filter, classifying particles between 0.005 and 2.5  $\mu\text{m}$  (aerodynamic diameter). The results show that HFO firing produces significantly higher PM emissions (more than factor of about three on mass bases for high load operation) compared to LFO, especially for particles smaller than 0.5  $\mu\text{m}$ .

**Source:** Sarvi, Lyyrinen, Jokiniemi and Zevenhoven, Particulate emissions from large-scale medium-speed diesel engines: 1. Particle size distribution; *Fuel Processing Technology*, (2011, in press), [doi:10.1016/j.fuproc.2011.04.031](https://doi.org/10.1016/j.fuproc.2011.04.031).

## Driving Cycles

### Driving Cycle Development for Vietnam

The Centre for Environmental Monitoring of the Vietnam Environment Administration in Hanoi launched a 2-year emissions monitoring programme which aimed at determining the emission factors and emission inventories for two typical types of vehicle in Hanoi. This paper presents the results of the development of two driving cycles representative of

the local driving for a motorcycle and a light-duty vehicle (LDV) in Hanoi. These CEMDC and CECDL cycles can be applied to the next stage of the programme for emission testing to determine the emission factors for Hanoi as well as for government's emission control testing.

**Source:** Tong, Tung, Hung and Nguyen, Development of Driving Cycles for Motorcycles and Light Duty Vehicles in Vietnam; *Atmospheric Environment* (2011, in press), [doi:10.1016/j.atmosenv.2011.06.023](https://doi.org/10.1016/j.atmosenv.2011.06.023).

## Climate Change, CO<sub>2</sub> and Emissions

### Ancillary Benefits of Climate Policy

The results from this paper estimating the domestic ancillary pollution benefits of climate policy in Sweden indicate that the ancillary benefits constitute a far from insignificant share of total system costs, and this share appears to be highest in the scenarios that entail the largest emission reductions domestically. This result reflects the fact that carbon dioxide emission reductions abroad also implies a lost opportunity of achieving substantial domestic welfare gain from the reductions of regional and local environmental pollutants.

**Source:** Anna Krook Riekkola, Erik O. Ahlgren and Patrik Söderholm, Ancillary benefits of climate policy in a small open economy: The case of Sweden; *Energy Policy* (2011), [doi:10.1016/j.enpol.2011.06.015](https://doi.org/10.1016/j.enpol.2011.06.015).

### Effect of Dieselisation on CO<sub>2</sub> Emissions

Previous research has concluded that increasing the share of diesel vehicles will decrease CO<sub>2</sub> emissions. This work, however, uses an integral approach based on discrete choice models to analyse diesel vehicle penetration in a broader context of transport in Great Britain. It provides empirical evidence that only improvements in vehicle efficiency will not be enough to achieve the goals of mitigation of energy consumption and CO<sub>2</sub> emissions. The model shows the technical limitations that the penetration of diesel vehicles faces and concludes that a combination of improvements in public transportation and taxes on fuel prices is the most effective policy combination to reduce the total amount of energy consumption and CO<sub>2</sub> emissions among the analysed dieselisation policies.

**Source:** Miguel A. Tovar, An integral evaluation of dieselisation policies for households' cars; *Energy Policy* (2011) [doi:10.1016/j.enpol.2011.05.041](https://doi.org/10.1016/j.enpol.2011.05.041).



## **FORTHCOMING CONFERENCES**

### **4<sup>th</sup> International CTI Conference: Emission Relevant Sensors**

12-13 July 2011, Nuremberg, Germany

Details at [www.car-training-institute.com/emission-sensors](http://www.car-training-institute.com/emission-sensors)

*Topics include improved functions of the next generation of narrow-band oxygen sensors, accuracy determination of active thermocouple temperature sensors, soot sensor to fulfil Euro VI OBD requirements, resistive soot sensors, robust and reliable AdBlue<sup>®</sup>-capable pressure sensor.*

### **SAE Powertrains, Fuels and Lubricants**

30 August - 2 September 2011, Kyoto, Japan

Details at [www.jsae.or.jp/2011pf](http://www.jsae.or.jp/2011pf)

*Emissions topics include aftertreatment for CI and SI engines, future automotive catalysts and converter technologies, and the effects of fuels and lubricants on automotive devices.*

### **Diesel Emissions Conference India 2011**

5-7 September 2011, New Delhi, India

Details: [www.integer-research.com/conferences/dec-india](http://www.integer-research.com/conferences/dec-india)

*The conference will bring together over 200 leading stakeholders from India and beyond to discuss the industries' progress in meeting Bharat Stage III & IV legislation. The conference will also showcase the latest emissions reduction technologies being used in India and across the world.*

### **23<sup>rd</sup> International AVL Conference "Engine & Environment"**

8-9 September, 2011, Graz Austria

Details at [www.avl.com/conferences](http://www.avl.com/conferences)

*The topic of this year's conference is "Mastering Powertrain Diversity". Speakers and panellists will focus on the question of how, or even whether, it is possible to manage the growing diversity with reasonable effort.*

### **10<sup>th</sup> International Conference on Engines & Vehicles (ICE 2011)**

11-15 September 2011, Capri, Italy

Details at [www.sae-na.it](http://www.sae-na.it)

*Topics of the conference include powertrain technology; exhaust aftertreatment and emissions; fuel injection and combustion processes; alternative and advanced power systems; and fuels.*

### **Selective Catalytic Reduction 2011**

26-28 September 2011, Wiesbaden, Germany

Details at [www.scr-systems.de](http://www.scr-systems.de)

*IQPC, the organisers of this conference, say that the conference will cover the challenges and the chances*

*of the Euro 6/VI and Euro7/VII through the view of an OEM, future aspects for SCR system optimisation, new control strategies for modern SCR applications, new developments in NH<sub>3</sub> catalysts, innovative SCR systems and the latest component improvements such as SCR injection systems, urea lines, storage and delivery.*

### **Green Ship Technology Asia Conference 2011**

28-29 September 2011, Singapore

Details at [www.informaglobalevents.com/event/gst-asia](http://www.informaglobalevents.com/event/gst-asia)

*The conference will have a programme of targeted, technical and operational presentations, technical streams, stakeholder panels and breakfast briefings, including one on abatement technology.*

### **2011 Directions in Engine-Efficiency and Emissions Research (DEER) Conference**

3-6 October 2011, Detroit, Michigan, USA

Details at [www.orau.gov/deer2011](http://www.orau.gov/deer2011)

*DEER 2011 is sponsored by the U.S. Department of Energy's (DOE) Office of Vehicle Technologies (OVT) and is DOE's primary mechanism for the public exchange of state-of-the-art combustion engine research and development.*

### **20<sup>th</sup> Aachen Colloquium on Automobile and Engine technology**

10-12 October 2011, Aachen, Germany

Details at [www.aachen-colloquium.com/index\\_e.htm](http://www.aachen-colloquium.com/index_e.htm)

*Papers are solicited on innovative vehicle concepts, electric vehicles and hybrids, commercial vehicles, energy and thermal management, and automotive strategy concepts.*

### **XIX International Symposium on Alcohol Fuels**

10-14 October 2011, Verona, Italy

Details at [www.isaf2011.it](http://www.isaf2011.it)

*Much of the conference will concentrate on biofuel production, but there is a session on alcohols and biofuels end use in transport.*

### **Diesel Emissions Conference USA**

17-19 October 2011, Atlanta, Georgia, USA

Details at <https://www.integer-research.com/conferences/dec-usa>

*The conference will bring together leading stakeholders from around the globe to discuss the latest emissions technologies available to meet current and future legislation.*

### **European Electric Vehicle Congress**

26-28 October 2011, Brussels, Belgium

Details at [www.eevc.eu](http://www.eevc.eu)

*A plenary session will be dedicated to the strategic policy for "Europe's vision and action plan", two full days will be R&D oriented but industry and political aspects will not be forgotten. The last part of the conference will then gather participants in round tables discussions on topics including plug-in hybrids, hydrogen and fuel cells, and health.*

## **SAE 2011 Light Duty Diesel Emissions Control Symposium**

2-3 November 2011, Ann Arbor, Michigan, USA

Details at [www.sae.org/events/training/symposia/lddec/index.htm?&PC=11LDDECEM1&PCN=6100930498](http://www.sae.org/events/training/symposia/lddec/index.htm?&PC=11LDDECEM1&PCN=6100930498)

*The conference will discuss and present information highlighting the pathways to emissions compliance and technologies that are under investigation, being demonstrated, and are set to be applied on current and future generations of light-duty diesel engines.*

## **SAE 2011 Small Engine Technology Conference**

8-10 November 2011, Sapporo, Japan

Details at [www.setc-jsae.com](http://www.setc-jsae.com)

*The conference will cover products such as ATVs, motorcycles, generators and agricultural/gardening equipment, focussing on combustion engines but also covering hybrids and electric drive.*

Includes AECC/TU Graz paper "A demonstration of the emission behaviour of 50 cm<sup>3</sup> mopeds in Europe including unregulated components and particulate matter".

## **2011 Conference of Polis & the European Economic and Social Committee: Innovation in transport for sustainable cities and regions.**

29-30 November 2011, Brussels, Belgium

Details at [www.polisnetwork.eu/publicevents/68/61/Polis-Annual-General-Assembly-and-Annual-Conference/](http://www.polisnetwork.eu/publicevents/68/61/Polis-Annual-General-Assembly-and-Annual-Conference/)

*Topic areas include traffic efficiency and mobility; economic and social dimension of transport; and environment and health, including clean vehicles, electro-mobility and active transport for health.*

## **The Spark Ignition Engine of the Future**

30 November – 1 December 2011, Strasbourg, France

Details at [www.sia.fr/evenement\\_detail\\_the\\_spark\\_ignition\\_engine\\_call\\_for\\_1085.htm](http://www.sia.fr/evenement_detail_the_spark_ignition_engine_call_for_1085.htm)

*This conference is intended to provide the opportunity for both technical experts and executives from the automotive industry, the oil industry, external analysts, research laboratories and universities to exchange their points of view and information on the potential of the future spark ignition engine to respond to the main challenges of mobility, CO<sub>2</sub> emissions and hybridization.*

Includes AECC/TU Graz paper "Regulated and non-regulated emissions of selected state-of-the-art European mopeds".

## **Diesel Emissions Conference Russia 2012**

9-10 February 2012, Russia

Details will be at

[www.integer-research.com/conferences/dec-russia](http://www.integer-research.com/conferences/dec-russia)

## **Diesel Emissions Conference & AdBlue® Forum Asia 2012**

6-8 March 2012, China

Details will be at

[www.integer-research.com/conferences/dec-asia](http://www.integer-research.com/conferences/dec-asia)

*The conference will facilitate focused discussion on the future diesel emissions market in Asia. Technology discussions will include NO<sub>x</sub> & PM reduction technologies such as SCR, EGR, DOC and DPF, and CO<sub>2</sub> reduction technologies such as hybrid systems and bio-fuels.*

## **Fuel Systems for IC Engines**

14-15 March 2012, London, UK

Details at [www.imeche.org/events/c1342](http://www.imeche.org/events/c1342)

*This conference will focus on the latest technology for state-of-the-art system design, characterisation, measurement, and modelling, addressing all technological aspects of diesel and gasoline fuel injection systems. This will range from fundamental fuel spray theory, component design, to effects on engine performance, fuel economy and emissions.*

## **Diesel Emissions Conference & ARLA 32 Forum Brazil 2012**

17-19 April 2012, Brazil

Details at

[www.integer-research.com/conferences/dec-brazil](http://www.integer-research.com/conferences/dec-brazil)

*Over 40 presentations and panel discussions, the conference will discuss the latest developments in PROCONVE P7 diesel emissions legislation, and latest NO<sub>x</sub> reduction technologies for heavy-duty, non-road and passenger vehicles, including SCR, EGR, DOC and DPF. The conference will also discuss developments in CO<sub>2</sub> reduction technologies, including hybrid systems and bio-fuels.*

## **Transport Research Arena Conference**

23-26 April 2012, Athens, Greece

Details at [www.traconference.eu/](http://www.traconference.eu/)

*The conference brings together academia and industry from Europe and the rest of the world to present research (theoretical and applied) on pressing problems of the transport.*

## **SAE 2012 World Congress**

24-26 April 2012, Detroit, Michigan, USA

Details at

<http://www.sae.org/congress/techprogram/cfp.pdf>

## **Key Developments in the Port and Maritime Sector**

17-18 May 2012, Antwerp, Belgium

Details at

<http://webh01.ua.ac.be/sig2/wctrs/html/activities.html>

**Deadline for Abstracts: 15 December 2011**

*The Special Interest Group 2 (Ports and Maritime) of the World Conference on Transport Research Society (WCTRS), will host this conference. It will be held at the Department of Transport and Regional Economics at the University of Antwerp, Belgium. Topics include environmental issues, maritime engineering and legal issues.*

## **Diesel Emissions Conference & AdBlue® Forum Europe 2012**

12-14 June 2012, Germany

Details will be at

[www.integer-research.com/conferences/dec-europe/2012](http://www.integer-research.com/conferences/dec-europe/2012)

*Government lead discussions will include updates on Euro VI legislation for heavy-duty vehicles (2013) and passenger cars (2014), and stage IV (2014) for non-road vehicles. Technology discussions will provide insight into the latest developments in CO<sub>2</sub> technologies, such as alternative fuels, bio-diesel and hybrid systems, and NO<sub>x</sub> technologies including SCR, EGR, DOC & DPF.*

## **16<sup>th</sup> ETH Conference on Combustion Generated Nanoparticles**

24-27 June 2012 (Tentative), Zürich, Switzerland

## **Diesel Emissions Conference India 2012**

4-6 September 2012, India

Details will be at

[www.integer-research.com/conferences/dec-india/2012](http://www.integer-research.com/conferences/dec-india/2012).

## **Diesel Emissions Conference USA 2012**

16-18 October 2012, USA

Details will be at

[www.integer-research.com/conferences/dec-usa/2012](http://www.integer-research.com/conferences/dec-usa/2012).

## **Symposium on International Automotive Technology (SIAT 2013)**

16-19 January 2013, India