



# Newsletter

November - December 2009

## INTERNATIONAL REGULATORY DEVELOPMENTS

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## EUROPE

### New European Commission

On 27 November 2009, José Manuel Barroso, President of the European Commission, announced the portfolio responsibilities for the next Commission. There is a new Directorate-General for Climate Action, taking some responsibilities from the Environment Directorate, and DG Transport and Energy is split into two.

The Commissioners-designate that will have the main influence on emissions-related issues are:

- Antonio TAJANI: Industry and Entrepreneurship.
- Janez POTOČNIK: Environment.
- Connie HEDEGAARD: Climate Action.
- Maire GÖGHEGAN-QUINN: Research and Innovation.
- Siim KALLAS: Transport.
- Günter OETTINGER: Energy.
- John DALLI: Health and Consumer Policy.

The new Commission must gain approval from the European Parliament before it takes office for a term running until 31 October 2014. Commissioners-designate will appear in individual hearings before Parliamentary committees in January, with a vote on the new Commission as a whole on 26 January 2010.

### Progress on Euro VI Technical Regulation

As a result of a number of meetings with stakeholders, a draft of the Technical Regulation to implement the heavy-duty Euro VI Regulation was reviewed by the December meeting of the EU's Technical Committee - Motor Vehicles (TCMV). A number of sections are not yet complete, but it includes a replacement table of proposed limit values for the world-harmonised cycles (only), with particle number limits:

	Limit Values							
	CO	THC	NMHC	CH <sub>4</sub>	NO <sub>x</sub> <sup>(1)</sup>	NH <sub>3</sub>	PM mass	PM <sup>(2)</sup> number
	mg/kWh				ppm	mg/kWh	#/kWh	
WHSC (CI)	1500	130			400	10	10	8.0 x 10 <sup>11</sup>
WHTC (CI)	4000	160			460	10	10	6.0 x 10 <sup>11</sup>
WHTC (PI)	4000		160	500	460	10	10	<sup>(3)</sup>

PI = Positive Ignition, CI = Compression Ignition

- (1) The admissible level of NO<sub>2</sub> may be defined later.
- (2) Measurement procedure to be introduced by 31/12/2012.
- (3) Particle number limit shall be introduced by 31/12/2012.

This draft includes revised reference fuel specifications which differ from those for light-duty Euro 5 and 6. Test methods for ammonia (FTIR or Laser Diode Spectrometry) are specified and Portable Emissions Measurement Systems (PEMS) are to be used for In-service Conformity. The procedure for particle number measurement will be defined once the work of the UN-ECE's PMP group is completed.

Multiplicative or additive Deterioration Factors for durability performance are to be permitted, with the assigned multiplicative factors currently shown as:

Test cycle	CO	THC <sup>(1)</sup>	NMHC <sup>(2)</sup>	CH <sub>4</sub> <sup>(2)</sup>	NO <sub>x</sub>	NH <sub>3</sub>	PM mass	PM number
WHTC	1.3	1.3	1.4	1.4	1.1	1.0	1.05	1.0
WHSC	1.3	1.3	1.4	1.4	1.1	1.0	1.05	1.0

- (1) Applies in the case of a compression ignition engine
- (2) Applies in the case of a positive ignition engine

The draft submitted to TCMV is available at [http://circa.europa.eu/Public/irc/enterprise/automotive/library?l=technical\\_committee/meeting\\_december\\_2009/091207\\_regulation-/ EN 1.0 &a=d](http://circa.europa.eu/Public/irc/enterprise/automotive/library?l=technical_committee/meeting_december_2009/091207_regulation-/ EN 1.0 &a=d)

### EU rejects 92 out of 97 Air Quality Derogation Requests

The European Commission has continued its tough stance against further delays in meeting EU air quality standards by rejecting 92 out of 97 requests for extended deadlines in various zones in Bulgaria, Poland and the UK.

Almost all the requests relate to the PM<sub>10</sub> limits that should have been met in 2005. Poland also requested a temporary postponement of the deadline to meet the NO<sub>2</sub> limit values in one zone. The commission approved the extension of PM<sub>10</sub> limits in five zones in Poland until 2011, but all other requests were rejected because the Commission said there was insufficient data or because abatement measures outlined by the countries could not guarantee that the standards would be met within the extended deadline.

### Commission sends Final Warning to Three Member States over PM<sub>10</sub>

The European Commission has sent a final written warning to Estonia, Slovenia and Sweden over breaches of the EU air quality standards for fine particulate matter (PM<sub>10</sub>). The standards entered into force in 2005 and none of the three Member States has requested a time extension to meet them.

Environment Commissioner Stavros Dimas said: "Airborne particles are dangerous to human health and it is essential that Member States comply with the EU standards as quickly as possible. Where a Member State is in breach of the standards and has not requested a time extension, the Commission has no choice but to take Court action unless they remedy the situation quickly."

In January 2009, the Commission launched infringement proceedings against 10 Member States which had not submitted notifications or had not notified all air quality zones exceeding the limit values for PM<sub>10</sub>. Since then all the Member States concerned have submitted a time extension notification except for Estonia, Slovenia and Sweden. Their air quality data

for 2008 show that the limit values continue to be exceeded in certain air quality zones. The Commission has therefore sent all three Member States a final written warning indicating that they risk being taken to the European Court of Justice unless they comply with the requirements of the legislation.

## **EEA introduces 'AirWatch' Interactive Air Quality Application**

The European Environment Agency (EEA) has expanded its 'Eye on Earth' portal with a new application, 'AirWatch'. This application provides information on air quality to more than 500 million people across Europe, bringing together both measured and modelled data for the first time, alongside citizens' observations on air quality.

The site provides figures (in  $\mu\text{g}/\text{m}^3$ ) for ozone,  $\text{NO}_2$  and  $\text{PM}_{10}$ . The site is at <http://eyeonearth.cloudapp.net>.

## **EU 2007 Pollutant Release Data**

The first inventory of the new European pollutant release and transfer register (E-PRTR) was published on 9 November 2009, consisting of 2007 data on emissions of 91 pollutants from more than 24 000 industrial facilities across Europe. The new register fulfils a requirement under the international protocol on pollutant release registers which entered force in October 2009.

The register will be updated in April each year starting from 2010. It is available at <http://prtr.ec.europa.eu>.

## **Commission approves Aid Schemes for Low- $\text{CO}_2$ Buses**

The European Commission has authorised an aid scheme supporting the purchase of low- $\text{CO}_2$  buses in England. The 'Green Bus Fund' is open to bus operators purchasing buses (of any technology) capable of achieving at least a 30% reduction in  $\text{CO}_2$  emissions compared to standard buses. A budget of £30 million is available from 2009 to 2011.

The Commission has also authorised German state aid to public transport companies for the purchase of hybrid buses complying with strict emissions standards. The total 2-year budget is €20 million.

Sweden has notified the EU of proposed incentives for the purchase of buses with better environmental characteristics and hybrid electric buses. Passenger vehicles taken into service for the first time on or after 1 July 2009 are to be exempt from vehicle tax if they meet the exhaust gas requirements for Environmental Class 2005 (Euro IV) or Environmental Class Electric.

## **Environmental Organisations suggest NOx Tax for Ships**

"A charge on  $\text{NO}_x$  emissions from ships of about €470 per tonne could cut emissions in the Baltic Sea by nearly 60% annually," according to a study by AirClim, T&E and EEB released on 23 November 2009.

The NGOs say that tougher  $\text{NO}_x$  standards for new ships adopted last year are hindered by a slow fleet turnover rate.  $\text{NO}_x$  emissions from ships in European waters are forecast to grow by nearly 40% between 2000 and 2020, according to the report. Their study analyses the effectiveness of economic instruments including emissions trading and differentiated port dues. Although it uses the Baltic Sea as a case study, the three organisations say their conclusions are "most probably" applicable to other seas as well.

## **Study says Air Pollution poses Problems for Greek Cities**

A study by Greece's National Centre for the Environment and Sustainable Development (EKPA) released on 11 November 2009 found that air pollution and inadequate waste management are ongoing problems in Athens and other major Greek cities. Rising air pollution levels in the northern port city of Thessaloniki, the western town of Patras, the eastern town of Volos and the north-western town of Kozani were mentioned. EKPA President Yiannis Ziomas told reporters that "urban air pollution remains one of the country's major problems". The 2008-2009 study was the first to be carried out by EKPA since the independent organisation (under the auspices of the Environment Ministry) was formed in 2000.

## **Netherlands plans Kilometre Charging and Emissions-based Parking Charges**

Under a legislative proposal sent to the Dutch Parliament on 13 November 2009, vehicle registration and circulation taxes in the Netherlands would be replaced by a kilometre charge from 2012.

Every vehicle type will have a base rate, which will depend on its size, weight and  $\text{CO}_2$  emissions. Taxis, vehicles for the disabled, buses, motorcycles and classic cars will all be exempt. The basic charge for cars will rise from €0.03 to €0.067/km over the period 2012-2018. For commercial vans the base tariff depends on the weight. The average van tariff in 2012 and beyond is to be €0.017 per kilometre. The base tariff for heavy goods vehicles depends on the maximum weight and Euro emission class. The average tariff is €0.024 per kilometre. Besides this base tariff, the law allows for a peak hour surcharge. This will apply to structural bottlenecks in the road

network and potential short cuts. Additional legislation will govern whether or not a rush hour surcharge will apply to a particular location. Each vehicle will be equipped with a GPS system to record when, where and how far it is driven.

The government says that CO<sub>2</sub> and particulate emissions from road transport would be cut by more than 10% under the plans, while over half of car owners would pay less in taxes than they do currently.

The Netherlands has also advised the EU of a new legislative act laying down rules on the differentiation of parking fees based on the degree of air pollution caused by a vehicle. The aim is to discourage the use of polluting cars in inner-city areas. These regulations will allow designated municipal councils to determine the rate of parking fees, partly in relation to the vehicle's emission of particulate matter and NO<sub>2</sub>.

## Car Scrappage Scheme for Russia

Russian Prime Minister Vladimir Putin has pledged to widen Russia's anti-crisis aid package with a car scrappage scheme. He announced the measures on 21 November 2009 to members of his United Russia party at a congress in St Petersburg. Putin said the government would pay 50 000 roubles (€1160) to car owners who agreed to trade in vehicles over 10 years old for new domestically made cars.

## Congestion Tax in Stockholm improved Air Quality and Health

An evaluation of the effects of Stockholm's congestion tax trial reveals a decrease of 8.5% in NO<sub>x</sub> emissions and of 13% in PM<sub>10</sub> emissions in the congestion zone.

Based on measured and modelled changes in road traffic, the researchers estimated that the tax reduced total road use by 15% within the charge area. Using air dispersion modelling, the study estimated the changes in air quality. The calculations indicate that a permanent congestion tax system would reduce the annual average NO<sub>x</sub> concentrations for the streets with the densest traffic by up to 12% and for PM<sub>10</sub> by 7%. Despite this improvement in air quality, the limit values for both NO<sub>x</sub> and PM<sub>10</sub> were not achieved on streets with the heaviest traffic.

Total population exposure to NO<sub>x</sub> emissions in the area of Greater Stockholm was estimated to drop by 0.23 µg/m<sup>3</sup>. Based on a long-term epidemiological study, that found an increased mortality risk of 8% per 10 µg/m<sup>3</sup> NO<sub>x</sub>, the researchers estimate that this reduction would avoid 27 premature deaths each year. Over a ten year period, 206 years of life are gained for every 100 000 people benefiting from reduced exposure to traffic pollution. The authors say that the effects on mortality are likely to be caused by

vehicle exhaust particles, not NO<sub>x</sub>, but NO<sub>x</sub> measurements act as a useful indicator of exposure to traffic pollution.

**Source:** Johansson, Burman and Forsberg, The effects of congestions tax on air quality and health; *Atmospheric Environment*, Vol.43, Iss.31, pp 4843-4854; [doi: 10.1016/j.atmosenv.2008.09.015](https://doi.org/10.1016/j.atmosenv.2008.09.015).

## **NORTH AMERICA**

### US-EPA issues Notice on Urea-SCR

On 9 November 2009, the US Environmental Protection Agency (EPA) published a notice in the Federal Register announcing that the agency has approved diesel vehicle/engine-maker application of urea-selective catalytic reduction (SCR) technology to meet the EPA's new limits on nitrogen oxides (NO<sub>x</sub>).

The notice applies to light-duty and chassis-certified diesel vehicles for model years 2009 to 2010, plus heavy-duty diesel vehicles and heavy-duty diesel engines for model years 2009 to 2011.

The EPA's notice recognises that periodic refilling of the urea tank is considered critical emission-related maintenance to maintain compliance with NO<sub>x</sub> limits. EPA's scheme for certifying urea-SCR systems requires vehicle/engine makers to require urea refills at routine oil changes or at diesel refuelling stations, roughly every 10 000 miles.

EPA says that for vehicles such as dump trucks, concrete mixers and garbage trucks that are typically refuelled at a central location, the manufacturers believe the urea tank refill interval should equal the vehicle's operational range so that the urea is refilled at every refuelling. For all other vehicles equipped with a constantly viewable urea level indicator, the urea tank refill interval must provide a range of vehicle operation that is no less than twice the range of vehicle's fuel capacity. For all other vehicles that do not have a constantly viewable level indicator the urea tank refill interval must provide a range of vehicle operation that is no less than three times the range of the vehicle's fuel capacity.

### US-EPA finalises Emissions Standards for Marine Engines

On 22 December 2009 the US Environmental Protection Agency announced final standards for emissions from 'category 3' main propulsion engines on ocean-going vessels.

The new standards apply to new marine diesel engines with displacement at or above 30 litres per cylinder installed on US-flagged vessels. The final standards are equivalent to those adopted in the amendments to Annex VI to the International Convention for the Prevention of Pollution from Ships

(MARPOL). The emissions standards apply in two stages: near-term standards for newly-built engines will apply from 2011, and long-term standards requiring an 80% reduction in NOx will begin in 2016.

The EPA is also adopting changes to its diesel fuel programme to allow for the production and sale of diesel fuel with up to 1000 ppm sulfur for use in Category 3 marine vessels. The regulations generally forbid production and sale of fuels with more than 1000 ppm sulfur for use in most US waters, unless operators achieve equivalent emissions reductions in other ways. EPA is also adopting provisions to apply some emissions and fuel standards to foreign-flagged and in-use vessels that are covered by MARPOL Annex VI. Details of the final rule are at [www.epa.gov/otaq/oceanvessels.htm](http://www.epa.gov/otaq/oceanvessels.htm).

## **US-EPA says that Black Carbon contributes to Climate Change**

The US Environmental Protection Agency's 'Final Endangerment Finding' for greenhouse gases, released on 7 December 2009, recognises that black carbon is an important climate-forcing agent and notes that diesel vehicle PM emissions contain a higher fraction of black carbon than other sources.

However black carbon is not included in the list of six greenhouse gases that EPA says threaten public health and welfare. This is because there are some significant scientific uncertainties about black carbon's total climate effect as well as concerns about how to treat the short-lived black carbon emissions alongside the long-lived, well-mixed GHG emissions in a common framework. EPA has various petitions pending under the Clean Air Act calling on it to make an endangerment finding and regulate black carbon.

In the findings, EPA says that the six greenhouse gases - CO<sub>2</sub>, methane, nitrous oxide (N<sub>2</sub>O), hydro-fluorocarbons, perfluorocarbons and sulfur hexafluoride - in the atmosphere threaten the public health and welfare of current and future generations. EPA also finds that emissions of greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the threat. The findings do not themselves impose any requirements on industry, but they are a prerequisite to finalising EPA's proposed greenhouse gas emissions standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on 15 September 2009.

## **Review of US Air Pollutant Standards**

The US Environmental Protection Agency's Assistant Administrator for Air and Radiation has announced

that the Agency will, between 2008 and 2011, revise existing standards for six major air pollutants.

Six National Ambient Air Quality Standards (NAAQS) are currently in effect: ozone, particulate matter, lead, sulfur dioxide, nitrogen dioxide, and carbon monoxide. For each of the six pollutants, EPA must set standards sufficiently protective of both public health (called the primary standard) and public welfare (called the secondary standard). The Clean Air Act requires EPA to review and, if necessary, revise the standards every five years. Although ozone is not scheduled for another review until 2013, reviewing the standards ahead of the five-year schedule has been an early priority for the current EPA Administrator, with proposals expected in December 2009. EPA also expects to propose new fine particulate standards in July 2010 and finalise them by April 2011.

## **US-EPA releases Scientific Assessment for Particulate Matter**

On 17 December 2009, the US Environmental Protection Agency (EPA) released its final Integrated Science Assessment in support of its review of the National Ambient Air Quality Standard (NAAQS) for particulate matter.

EPA is reviewing the 2006 NAAQS for PM<sub>2.5</sub> under federal court order, following criticism from the agency's Clean Air Scientific Advisory Committee (CASAC) that the standard is too lax. EPA has included this re-evaluation into the regular NAAQS review process.

The assessment shows that evidence of the harm caused by Particulate Matter (PM) exposure has grown since EPA issued the last PM Air Quality Criteria document in 2004. It finds the strongest links between ill health and PM<sub>2.5</sub> exposure to be during short-term, 24-hour exposure, and finds such exposure to be "causal" for cardiovascular effects and mortality, and "likely to be causal" for respiratory problems. For long-term exposure, EPA again finds causal evidence for cardiovascular effects and mortality effects, and likely causal respiratory outcomes. However, EPA only finds "suggestive" evidence of reproductive and developmental effects, as well as cancer, mutagenicity and genotoxicity. Despite this EPA notes the mounting evidence for reproductive effects, such as pre-term birth and low birth weight, and also a link to lung cancer, from exposure to PM<sub>2.5</sub>.

For the coarse fraction of particles between 2.5 and 10 µm in size, the evidence remains more sketchy. For cardiovascular effects, respiratory effects and mortality, the link between short-term exposure and adverse health effects is suggestive, EPA says.

With regard to ultrafine particles, the evidence is suggestive of a link between cardiovascular effects and respiratory effects, the assessment says. In the case of both coarse fraction and ultrafine particles, EPA notes that there is inadequate evidence at present to determine the existence of a link between long-term exposure and adverse health effects.

The assessment also finds a causal relationship between PM and obscured visibility, corrosion of materials and buildings, and also climate change - "a causal relationship exists between PM and effects on climate, including both direct effects on radiative forcing and indirect effects that involve cloud feedbacks that influence precipitation formation and cloud lifetimes". EPA adds that PM/climate effects are complex, contributing to both heating and cooling of the atmosphere. EPA is expected to complete its review of the PM<sub>2.5</sub> NAAQS by April 2011.

## **California proposes Amendments to Retrofit Verification Procedures**

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The California Air Resources Board (CARB) has published proposed amendments to the verification procedure, warranty, and in-use compliance requirements for strategies to control emissions from in-use diesel engines. These procedures and requirements are used by CARB to evaluate Diesel Emissions Control Strategies (DECS) through emissions, durability, and field testing. It also permits further evaluation after installation, through warranty and in-use compliance requirements.

Amongst other requirements, the proposed amendments identify transport refrigeration units, auxiliary power units, locomotive and marine applications as off-road sub-categories and clarify appropriate test cycles for them. Filter-based DECS must store exhaust backpressure and temperature data for a specified period, and a new requirement is a 'pre-installation assessment' of compatibility to ensure a given system is suitable, with specific monitoring and data logging requirements.

During durability and field demonstration trials, engine speed, date and time must be continuously measured, installations must comply with California's industrial safety and visibility requirements, and any incidents must be reported with 45 days (currently 90). Digital photographs of DECS, vehicles, and equipment used in demonstrations must be provided to CARB.

The changes require maintenance information, including filter cleaning, to be provided to end users. They also clarify the range of remedial action available to CARB if reported warranty claims exceed 4% of the units sold.

[www.arb.ca.gov/regact/2010/verdev2010/verdevisorappa.pdf](http://www.arb.ca.gov/regact/2010/verdev2010/verdevisorappa.pdf)

## **California ARB proposes Relaxing In-Use Diesel Truck and Bus Emissions Rule**

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The California Air Resources Board (CARB) says it will explore regulatory flexibility for fleet owners and delay the implementation of its emissions rule for in-use diesel trucks and buses, in part due to the positive effect of the economic recession on diesel emissions.

The rule currently requires the installation of diesel particulate filters starting in January 2011, with nearly all vehicles upgraded by 2014. A number of flexibilities are being considered, including deferring all of the first year requirements, or a 2-year deferral for some fleets and/or vehicles. CARB will consider the amendments at its meeting in April 2010.

## **New York delays Enforcement of Retrofit Regulation**

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The New York State Department of Environmental Conservation has delayed until 2010 the enforcement of its regulation requiring retrofitting or replacement of heavy-duty diesel vehicles owned by New York State agencies, authorities and their contractors. The law came into effect on 14 August 2009.

The department decided to delay enforcing the legislation, which requires application of best available retrofit technology to both on-road and off-road diesel vehicles, on the grounds of hardship to contractors and material suppliers that use the diesel vehicles on state-sponsored construction projects.

## **Canada proposes Greenhouse Gas Regulation for Light-Duty Vehicles**

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On 7 December 2009, the Canadian government released draft regulations to limit Greenhouse Gas (GHG) emissions from new light-duty vehicles beginning with the 2011 model year. The proposal is aligned with the GHG programme proposed by the United States and includes separate limits for N<sub>2</sub>O and methane emissions.

Vehicle manufacturers would be required to comply with fleet average GHG emission standards for passenger cars and light trucks for each model year. A company's fleet average standard would be determined based on vehicle 'footprints' and the number of vehicles it sells in a given model year. The fleet average GHG emission standards would become progressively more stringent with each new model year from 2011 to 2016. Flexibility would be provided through a system of tradable emissions credits. Companies would be also able to generate GHG emissions credits for the 2008-2010 period if their average GHG performance exceeds specified emission levels based on US regulatory requirements.

The proposal includes provisions to recognise reductions in GHG emissions that are not measured in the tailpipe emissions test, and incentives for companies to market "advanced technology vehicles", including electric vehicles, plug-in hybrids and fuel cell vehicles.

It is anticipated that in 2016 the average GHG emissions of the Canadian new car and light truck fleet would match the average level of 155 g/km CO<sub>2</sub> projected for the US, giving a reduction of about 20% compared to the 2007 Canadian new vehicle fleet. The draft Regulation is at [www.ec.gc.ca/ceparegistry/documents/regs/ghg/COM1103\\_Draft\\_e\\_03.pdf](http://www.ec.gc.ca/ceparegistry/documents/regs/ghg/COM1103_Draft_e_03.pdf).

However, since the announcement, the province of Quebec has announced that it will adopt California's greenhouse gas (GHG) emissions standards. The province's Environment Ministry made the announcement on 28 December 2009.

The province's new rules will come into effect on 14 January 2010 and will also impose increasingly stringent limits on greenhouse gas emissions from cars and light trucks made between 2010 and 2016. Emissions from passenger vehicles will be cut by about 35% over the four years, from 187 g/km CO<sub>2</sub> to 127 g/km by 2016, Charles Larochelle, Assistant Deputy Environment Minister in Quebec, said. Quebec first announced its intention to adopt the California emissions standards two years ago.

## **Nova Scotia announces Funding for 'Green' Transportation Projects**

The province of Nova Scotia, Canada, has announced that it is to invest \$4.25 million (€2.7 million) in 'green' transportation and technology projects, focussing largely, but not entirely, on fuel-efficiency programmes. The investment will come from the ecoNova Scotia Clean Air and Climate Change fund.

The funding includes \$1.35 million to equip school buses with fuel-efficient technology such as heaters and timers, route optimization software, and emissions control technology as well as \$1 million for anti-idling devices, aerodynamic improvements, fuel-efficient tyres, and other fuel-reducing technologies for heavy-duty (class 8) trucks plus \$1 million towards the purchase of heavy-duty hybrid vehicle.

## **Quebec to introduce Mandatory Vehicle Emissions Inspections**

The Canadian province of Quebec has announced that, beginning in two years time, owners of cars built before 1995 will be required to submit them for mandatory emissions inspections. Those whose cars do not meet the standard will have to get their cars

repaired, or else the cars will be destroyed. The programme will affect 400 000 car owners. Quebec says the older cars are responsible for 50% of the pollution generated on the province's roads.

## **Test of Retrofit Oxidation Catalysts on Marine Barges**

The Mississippi River Corridor Tennessee (MRCT) has announced a \$2 million (€1.35 million) grant from the US Environmental Protection Agency to a consortium that will test 13 Diesel Oxidation Catalyst retrofits on six diesel-powered marine barges.

The consortium estimates that the scheme will eliminate about 94 tons of diesel particulate matter over five years. Installations are expected to be completed by the first quarter of 2010. The majority of the diesel engines to be used in the test will use ultra-low sulfur diesel fuel.

## **US offers to help Reduce Black Carbon Pollution around the Arctic**

The US has announced at the UN climate summit in Copenhagen that it will commit \$5 million (€3.5 million) towards international cooperation to reduce black carbon emissions in and around the Arctic.

Nancy Sutley, who chairs the White House Council on Environmental Quality, said the United States anticipates these funds will be matched by other nations to develop and implement mitigation efforts, which will help reduce Arctic warming while yielding direct public health and ecosystem benefits. In launching the new initiative, she cited the 2009 Tromsø Declaration of the Arctic Council, in which the eight member nations recognised that "protecting the Arctic against potentially irreversible impacts of anthropogenic climate change depends mainly on substantially reducing global emissions of carbon dioxide and other greenhouse gases." The Arctic Council highlighted the role of "short-lived climate forcers" such as black carbon, methane, and tropospheric ozone on Arctic climate change. They stated that reducing emissions of these 'forcers' has "the potential to slow the rate of Arctic snow, sea ice and sheet ice melting in the near-term."

## **ASIA PACIFIC**

### **'Emission Control Technologies 2009' Conference organised by ECMA**

On 6 and 7 November 2009, ECMA - AECC's sister-association in India - organised an international conference "Emission Control Technologies to Improve Ambient Air Quality - Path Forward for India (ECT-2009)" in New Delhi, India. Over 300 delegates

attended the conference. The principal participation was from Indian research institutes, NGO's, OEMs and industry representatives.

The Chief Guest for ECT-2009, was Mr Bhanot, former ARAI Director. After the inaugural session, there was a well-received keynote speech by Dan Greenbaum of the US Health Effects Institute. Mr. Jean, head of unit at the European Commission's DG-Enterprise and Industry, spoke in the opening session on the future emissions roadmap and Joe Kubsh of MECA presented the US perspective. Other technical sessions dealt with gasoline technology (which included an AECC presentation), diesel for cars, diesel for heavy-duty, motorcycles, engine technology and retrofit. The closing panel discussion dealt with "bridging the gap – one country; one legislation" as India is moving into the Bharat Stage IV legislation in the metropolitan areas.

## Taiwan to move to Euro 5 Diesel Standards

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Taiwan is to implement Euro 5 diesel emissions standards from 1 January 2012. The country has already mandated that diesel fuel must meet 'Euro 5' (10 ppm sulfur maximum) limits from 1 July 2011 and that petrol must meet the 'Euro 5' standard from 1 January 2012.

The Taiwan EPA says that for "light diesel cars" the NO<sub>x</sub> standard is tightened from 0.39 g/km to 0.28 g/km and the PM standard from 0.06 g/km to 0.005 g/km. For "heavy diesel cars" the NO<sub>x</sub> control standard has been tightened from 3.5 g/km to 2.0 g/km, and the emission standard on black smoke has been tightened from 25% to 15%. US vehicle models that conform to these new standards will also be certified. The announcement is at [www.epa.gov.tw/en/NewsContent.aspx?NewsID=1451&list=426&path=426](http://www.epa.gov.tw/en/NewsContent.aspx?NewsID=1451&list=426&path=426).

## India tightens Air Quality Standards

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Indian Environment Minister Jairam Ramesh announced new air quality standards on 19 November 2009, setting uniform standards for residential and industrial areas.

The Revised National Ambient Air Quality Standards 2009, which have been published in the official Gazette of India, are designed to provide a legal framework for control of air pollution and protection of public health. Previously, air quality standards for industrial areas were lower than in residential areas. The new guidelines were modelled on standards adopted by the European Union and recommended by the World Health Organization, a press release issued by the Environment Ministry said.

The revised guidelines add five hazardous chemicals to the list of chemicals that must be monitored under the National Ambient Air Quality Standards. These are ozone, arsenic, nickel, benzene, and benzo(a)pyrene (BaP). The permissible limit for sulfur dioxide and oxides of nitrogen in industrial areas will be lowered from 120 µg/m<sup>3</sup> to 80 µg/m<sup>3</sup> averaged over 24 hours, the same as that for residential areas. The limit for fine particulate matter 2.5 µm in diameter or smaller, will be 60 µg/m<sup>3</sup>. The standard for suspended particulate matter in industrial areas will be lowered from 360 µg/m<sup>3</sup> per 24-hour period to 140 µg/m<sup>3</sup>. For ozone and carbon monoxide, standards for short durations of up to a few hours have been set to reduce peak exposure.

The revised standards will be applicable uniformly, but the standards for oxides of nitrogen and sulfur dioxide will be more stringent in ecologically sensitive areas.

## India to form National Environmental Protection Authority

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US President Barack Obama and Indian Prime Minister Manmohan Singh have jointly launched a new US-India Green Partnership aimed at strengthening cooperation between the two nations on a wide range of environment and climate initiatives.

Among these initiatives is the creation of an Indian National Environmental Protection Authority (NEPA), intended to enhance the authority of Indian environmental agencies, improve public information and transparency, and demonstrate progress in environmental compliance and enforcement. The development of the Indian NEPA includes the establishment of a civil judiciary authority, the creation of a National Green Tribunal, and more general improvements in India's environmental data collection and analysis.

## Air Pollution in Lahore and Mumbai

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The air quality reports prepared by the Punjab Environment Protection Department (PEPD) indicate that ambient air in most parts of Lahore has become seriously polluted and it is increasing the ratio of lung diseases and infections in the general public.

Data collected during 2007 to 2009 reveal that emissions of SO<sub>2</sub>, NO<sub>2</sub>, methane and hydrocarbons, PM<sub>2.5</sub>, CO and other pollutants are on the rise in major areas of the City. Officials said the major source of the air pollution is the higher density of traffic on roads, poor motor vehicle examination system, traffic jams and industrial waste in the urban area.

The PEPD has proposed to the City District Government, the Traffic Planning and Engineering Agency (TEPA) and transport department to take



appropriate steps to stop the increase in emissions from vehicles damaging the environment, mostly in congested areas of the City. The PEPD has also asked the Ministry of Petroleum and Gas through the Ministry of Environment to reduce the sulfur content in the fuels. In addition, the PEPD proposed to introduce a 'pay principle' for vehicular emissions and recommended that motor repair workshops should have facilities for emissions testing in the city.

Meanwhile, officials of the Maharashtra Pollution Control Board (MPCB) say that levels of respirable suspended particulate matter (RSPM) and NO<sub>x</sub> have been soaring in Mumbai since 2005 due to vehicular traffic. According to the annual report of average air pollution made by the MPCB during 2005-08, nitrogen oxides have shown an upward trend, averaging 86 µg/m<sup>3</sup> in 2008. RSPM has always remained higher than the previous standards of 100 µg/m<sup>3</sup> in Mumbai. In 2005, the average was 180 µg/m<sup>3</sup>, rising to 202 µg/m<sup>3</sup> in 2008. The new Indian standards of ambient air quality are 40 µg/m<sup>3</sup> NO<sub>2</sub> and 60 µg/m<sup>3</sup> RSPM in industrial, residential and rural zones.

## **Indian Car Manufacturers reported to be asking for Delay**

In early December 2009, India's *Economic Times* reported that major car manufacturers were understood to have approached the government to extend the April 2010 deadline for new emissions standards by a couple of months because of concerns over the availability of appropriate fuels.

The petroleum ministry has set up a committee to ensure that 11 metros (Mumbai, National Capital Region (NCR), Kolkata, Chennai, Bangalore, Hyderabad, Ahmedabad, Pune, Surat, Kanpur and Agra) would adopt Bharat Stage IV (BS IV) emissions norms, and the remaining cities would upgrade to BS III by April 2010. The report says that whilst car makers are readying vehicles to comply with the new emissions requirements, the government has been unable to upgrade refineries in places such as Uttar Pradesh, Bihar, West Bengal and North East, to provide fuels matching the new emissions standards.

## **Sydney to retrofit Port Trucks**

Australia's New South Wales Roads and Traffic Authority (RTA) has offered road transport operators based at Port Botany in Sydney the opportunity to take part in a free diesel retrofit demonstration.

The programme, which is to run through 2010, will involve the installation of flow-through filters on up to 20 diesel trucks built before 2002 that operate from the port's container terminal and bulk liquids area. Participants may be required to make their truck

available for emissions testing, but there will be no cost for the supply or fitment of the emissions control equipment. The authority says it is conducting the demonstration programme because a majority of container transporters at the port are individual subcontractors, operating older and higher-polluting trucks that are often 20 to 30 years old.

## **PM Pollution in Pakistan's Major Cities**

Data collected by Pakistan Environmental Protection Agency (Pak-EPA) show that all the country's major cities have high levels of PM<sub>2.5</sub> compared to WHO recommendations of 35 µg/m<sup>3</sup>.

In the Federal Capital levels of 105.2 µg/m<sup>3</sup> were measured on 16 November 2009, 142 µg/m<sup>3</sup> on 17 November, rising to 234 µg/m<sup>3</sup> on 18 November before falling to 61.2 µg/m<sup>3</sup> on 19 November and then rising again to 131.2 µg/m<sup>3</sup> on 21 November and 137.8 µg/m<sup>3</sup> on 22 November. Similar data for Lahore, show PM<sub>2.5</sub> levels reaching 266.5 µg/m<sup>3</sup> on 17 November and in Karachi levels reached 200.9 µg/m<sup>3</sup> on 20 November. The situation in Balochistan (Quetta) was slightly better than other cities as the level recorded there reached 71.0 µg/m<sup>3</sup> on 18 November.

Data for levels of CO, SO<sub>2</sub> and NO<sub>2</sub> had been "more or less" within the permissible limits.

## **Urban Air Pollution in Indonesia**

Activists are warning that air pollution in Indonesian cities has reached "alarming" levels. Based on daily monitoring, urban residents inhaled healthy air less than two months per year due in large part to poor transportation management, they say.

A group of activists and government officials from the State Ministry for the Environment and the Transportation Ministry established a Forum for Indonesian Clean Air as part of its mission to push for sustainable transportation management to minimise air pollution. Poor quality of fuels, gas emissions and poor law enforcement were said to be exacerbating the country's transport system problems. The group says that only Bandung and Semarang residents have been breathing healthy air for more than one month per year since 2001. Other metropolitan areas including Jakarta, Surabaya and Medan enjoy less than 27 days of healthy air per year. A spokesman for the group says that all air pollutant parameters exceeded limits set by environmental authorities.

## **Pollution affects Health in Guangdong**

More than 41% of people in the Pearl River Delta have felt sick or uncomfortable this year because of the region's heavy pollution, a recent survey found.

Most suffer from diseases like cough, sore throat and upper respiratory infections, or feel agitated, depressed or can't sleep. The survey, conducted by the Guangdong provincial social research and study centre, interviewed more than 2000 residents in nine Pearl River Delta cities.

Air pollution is a serious concern. Cities in Guangdong experienced an average of more than 75 hazy days last year, a record high since 1949. Guangzhou experienced more than 110 hazy days last year. Haze is usually caused by suspended particles in the air that reduce visibility. It is often a mixture of aerosols and photochemical smog. The Guangzhou Institute of Tropical Oceanic Meteorology, said industrial and vehicle emissions are the main culprits causing haze.

## **Ho Chi Minh City sees no Decline in Air Pollution**

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Pollution caused by exhaust fumes, dust and noise in Ho Chi Minh City has not declined over the last year, according to the city's Environment Protection sub-department. The agency reported in November 2009 that tests at the city's six observation stations showed that up to 89% of air samples exceeded the acceptable maximum pollution levels.

The leading air pollution factor was exhaust fumes released by the increasing number of vehicles and the discharge of untreated smoke from production units.

Under a five-year plan ending in 2010, the city had set several targets in order to reduce air pollution, including lowering the number of individual vehicles and controlling exhaust fumes released by production units. However, the number of vehicles has continued to increase in recent years. By the end of last year, the city had more than 4 million motorbikes and 300 000 automobiles of various kinds, according to official figures. Nearly 60% of motorbikes do not meet emissions standards, the sub-department said.

## **China to expand New Car Incentive Schemes**

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China's Commerce Vice-Minister Jiang Zengwei has announced that the country will expand schemes that give consumers a discount if they trade in old cars and home appliances for new ones.

*Xinhua* news agency quoted Jiang as telling a forum in Beijing that the programmes would contribute to a fresh drive by the government to boost rural and urban consumption next year to push up overall economic growth. The trade-in offers, together with tax breaks on fuel-efficient cars, have helped sustain retail sales, which rose 16.2% in the year to October.

## **China announces New National Standards for Diesel Fuel**

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The Standardisation Administration of the People's Republic of China has announced new standards for diesel fuel, including a limit of only 0.5% on fatty acid methyl ester (FAME) biodiesel. The other limits are in line with the Euro 3 standard. From 1 January 2010, sulfur will be 350 ppm maximum for both highway and non-road diesel. Several cities in China have, though, already introduced 50 ppm sulfur (Euro 4) diesel.

## **MIDDLE EAST**

### **Improvements to Cairo's Air Quality**

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Cairo's air quality is considered to be amongst the worst in the world. The most severe suspended particle pollution episodes occur each October and November as the result of illegal burning of rice straw adding to traffic emissions, small industry emissions and open burning of solid waste.

Some recent improvement in year-round air quality has been due to the removal of many antiquated black and white taxis. Legislation required drivers to replace cabs that are more than 20 years old, with scrapping incentives and low interest loans to buy new taxis. Efforts are also being made to have taxis and other vehicles run on compressed natural gas, which is about a third of the price of petrol. Some power stations and factories are also switching over. Plans to move heavy industries away from cities should also enhance the air quality.

### **Iran's First Diesel Engine**

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Iranian Minister of Industries and Mines Ali Akbar Mehrabian has unveiled the first diesel engine built in Iran, at a ceremony held by the manufacturer Iran Khodro. The new light-duty diesel engine, which features a Diesel Particulate Filter and EGR, has achieved Euro 5 emissions standards. The 1.5-litre engine is claimed to achieve a fuel consumption of 5 l/100km on the combined cycle and is expected to cost less than \$1000 when in mass production.

## **UNITED NATIONS**

### **Non-Road Global Technical Regulation and Compromise on WHDC Confirmed**

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At the November 2009 meeting of the United Nations World Forum for Harmonization of Vehicle Regulations (WP.29), the proposal for a new global technical regulation (gtr) on Non-Road Mobile Machinery (NRMM) emissions was adopted. The new regulation will be included in the global registry as gtr No.11.

## **Compromise on World-harmonised Heavy-duty Emissions Test**

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At the November 2009 meeting of the UN's World Forum for Harmonization of Vehicle Regulations (WP.29), the US EPA confirmed that it had agreed a compromise position on the two key remaining options in the global technical regulation (gtr) on World-harmonised Heavy-duty Diesel Certification (WHDC; gtr No.4) and that it intends to support the WHDC.

The EPA said that they could support a WHDC that includes a 10-minute soak time between the cold- and hot-start phases of the transient cycle (WHTC) and an emission weighting factor of 14% (1/7) for the cold phase. Previously the US had insisted on a 20-minute soak and the 14% cold weighting, whereas the EU had proposed a 5-minute soak and 10% cold weighting. It is now expected that the compromise will be included in the EU's Euro VI heavy-duty emissions Regulation. The formal amendment to the gtr and a further amendment to UN-ECE Regulation 49 (Heavy-duty engine emissions) to incorporate it will be submitted to the emissions expert group (GRPE) in January 2010 with the intent of achieving adoption by WP.29 in June 2010.

## **Amendments to UN-ECE Regulations and Global Technical Regulations**

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In addition to adoption of the global technical regulation on Non-Road Mobile Machinery emissions and the achievement of a compromise on the heavy-duty engine emissions tests (see previous 2 items), a number of other developments were agreed at the UN WP.29 meeting in November 2009. These were:

- Adoption of Supplement 2 and Supplement 3 to the 05 series of amendments to UN-ECE Regulation No. 49 (Heavy-duty emissions);
- Adoption of a technical correction to UN-ECE Regulation No. 101 (CO<sub>2</sub> and fuel consumption);
- An amendment to gtr No. 4 (World-harmonised Heavy-duty Diesel Certification - WHDC); agreements on power measurement and filter media;
- A corrigendum to gtr No. 5 (On-Board Diagnostic systems); editorial changes on PM measurement.

## **INTERNATIONAL**

### **China and US to co-operate on Electric Vehicles**

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As part of a package of measures to strengthen cooperation between the US and China on clean and renewable energy, the two countries are to establish a US-China Clean Energy Research Centre to be staffed by scientists from both countries.

The package of measures announced on 17 November 2009 by US President Barack Obama and China's President Hu Jintao includes support for the Centre of \$150 million (€100 million) from public and private funding over the next five years, split equally between the two countries. The package includes development of joint standards for electric vehicles and demonstration projects in both countries. A US-China task force will create a multi-year roadmap to identify R&D needs as well as issues related to the manufacture, introduction and use of electric vehicles. The two countries say the roadmap will be made widely available to assist the global automotive industry. It will be updated regularly to reflect advances in technology and the evolution of the marketplace.

## **Global Greenhouse Gases "at highest Levels and still rising"**

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Last year's global concentrations of the three most prevalent, long-lived, anthropogenic greenhouse gases (CO<sub>2</sub>, methane and nitrous oxide) reached their highest levels since pre-industrial times, the World Meteorological Organisation (WMO) said in an annual report on 23 November 2009.

WMO said that concentrations of most greenhouse gases continue to increase and that since 1990, greenhouse gases have increased radiative forcing - a measure of global warming - by 26%.

## **GENERAL**

### **Climate Treaties should recognise the Effects of Air Pollution**

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On 2 November 2009, the Swedish Environmental Protection Agency issued a statement urging the international community to recognise the close relationship between air pollution and climate change. The statement detailed the conclusions of the Air & Climate Conference held in Gothenburg on 19-21 October 2009. The conference recommendations have been forwarded to all relevant bodies and presented at the UN-sponsored climate change summit in Copenhagen in December 2009.

While substances such as sulfate and organic carbon can have a cooling effect, the conference's final statement pointed out, emissions of other materials such as black carbon and ozone can raise temperatures. Policymakers should be aware of the potential short-term climate effects caused by various air pollutants or by actions cutting pollutants, it stated, adding that policies embracing both issues could improve both air quality and climate at a reduced cost. According to the final declaration, the Gothenburg Protocol could be revised to take into account the

climate effects of air pollutants and short-lived climate forcers such as black carbon, carbon monoxide, and methane. Furthermore, climate models need to take into account the effects of ozone and nitrogen on ecosystems, it stated.

## Reducing Climate Emissions will also Improve Health

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Cutting emissions to mitigate climate change will also make people healthier, according to a special series of articles published in medical journal, the Lancet, released ahead of the UN climate summit in Copenhagen.

World Health Organization (WHO) director, Margaret Chan, one of the key figures in global health research who wrote a comment article published alongside the Lancet reports, said health protection should be a criterion by which mitigation measures were judged. One group of researchers described the results of an 18-year study of the long-term health effects of pollution in the US. The team, led by Professor Kirk Smith from the School of Public Health at the University of California, Berkeley, US, pointed out that "short-lived" greenhouse pollutants, such as particles of black carbon and ozone, can directly damage the heart and lungs. They said that "separate climate change agreements" might be needed for these pollutants. The public health 'co-benefits' of black carbon reduction are higher in India than in any other country, with the potential to save 2 million lives in just the next few years, said the authors. The lead author said the monetary costs of reducing emissions would be more than offset by the reduction in pollution-related deaths.

## Agritechnica 2009

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Agritechnica, the world's largest exhibition for agricultural machinery and equipment, was held in Hannover, Germany, from 8 to 14 November 2009.

Amongst the engines displayed, AGCO Sisu exhibited three EU Stage IIIB engines and their respective exhaust aftertreatment systems, all including Selective Catalytic Reduction (SCR) for NO<sub>x</sub> control. Deutz displayed a selection of DEVERT (Deutz Variable Emissions Reduction Technology) items with Diesel Oxidation Catalyst (DOC) + Diesel Particulate Filter (DPF) for 56-115 kW TCD 2010 engines, SCR for the 250 kW TCD 2012 engine, DOC + DPF + SCR for the 250 kW TCD 2013 engine and SCR for the 390 kW TCD 2015 engine. A fuel burner for active regeneration was also displayed.

A display of the SCR system of the Fiat PowerTrain N67ENT engine was also exhibited. On the MTU booth, a technology demonstrator of an SCR system

was displayed. MAN presented a PM-KAT<sup>®</sup> system for their 294-353 kW 12.4-litre Stage IIIB & IV engine and a gas engine running on biogas and natural gas. John Deere's display focused on DOC + DPF systems for 6.8 and 13.5-litre Stage IIIB engines. Fendt displayed tractors equipped with a urea-SCR system and a layout of the Fendt 9460X combine harvester showed the location of the SCR system on top of the machinery. The Massey Ferguson Dyna VT 8690 tractor equipped with an SCR system was exhibited. Mercedes Benz presented light-duty all-terrain Unimog trucks equipped with Bluetec SCR systems.

## Global Commercial Vehicle Industry Meeting

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Chief executives of the world's leading heavy-duty vehicle and engine manufacturing companies met in Brussels on 3 December 2009 to discuss various opportunities and needs their industry is facing. The discussions focused primarily on climate change and global energy security, but also covered global air quality-related emissions standards, improved fuel quality and specifications for renewable fuels.

As a result of the meeting, the chief executives agreed to initiate through OICA (the International Organization of Motor Vehicle Manufacturers) a proposal to UN-ECE to develop a certification procedure for heavy-duty hybrid electric vehicles based upon the HILS procedure used in Japan and to ask UN-ECE to address this issue with urgency. They also agreed to recommend the introduction of legislative requirements regarding market fuels, to ensure that the appropriate, high-quality fossil and renewable fuels are globally available for today's vehicle technologies. They encouraged UN-ECE to initiate activities to develop metrics and methods to measure fuel efficiency of heavy-duty vehicles and engines and for evaluating fuel efficiency improvements of components related to air and rolling resistance.

## RESEARCH SUMMARY

### Health Effects of Emissions

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#### Emissions may promote Chronic Vascular Disease

This study examined the impact of diesel engine emissions on enzyme pathways involved in the formation and development of atherosclerotic plaques. The authors found that the diesel exhaust induced dose-related alterations and say this indicates that whole emissions from mobile sources may have a significant role in promoting chronic vascular disease.

**Source:** Campen et al, Inhaled diesel emissions alter atherosclerotic plaque composition in ApoE<sup>-/-</sup> mice; *Toxicology and applied Pharmacology*, doi: [10.1016/j.taap.2009.10.021](https://doi.org/10.1016/j.taap.2009.10.021).

## Air Pollution increases Infants' Bronchiolitis Risk

The author's analysis showed that infants who lived within 50 m of a highway had an increased risk of 6% for bronchiolitis whilst those who lived in a higher wood smoke exposure area had an increase of 8% in their risk of bronchiolitis. No adverse effect of increased exposure to PM<sub>10</sub>, PM<sub>2.5</sub> or black carbon was observed.

**Source:** Karr et al, Influence of Ambient Air Pollutant Sources on Clinical Encounters for Infant Bronchiolitis; *American Journal of Respiratory and Critical Care Medicine*, Nov.2009, Vol.180 pp.995-1001, [doi:10.1164/rccm.200901-0117OC](https://doi.org/10.1164/rccm.200901-0117OC).

## Effect of NO<sub>2</sub> and SO<sub>2</sub> on Cardiovascular Markers

This paper reports an investigation of long- and short-term effects of air pollution exposure on serum levels of inflammatory and coagulation markers relevant for cardiovascular pathology. Systemic inflammation and perturbation of the coagulation balance are potential mechanisms for the effects of ambient air pollutants leading to adverse cardiovascular effects. The researchers concluded that their results suggest that exposure to moderate levels of air pollution may influence serum levels of inflammatory markers.

**Source:** Panasevich et al, Associations of long- and short-term air pollution exposure with markers of inflammation and coagulation in a population sample. *Occupational and Environmental Medicine*, Vol.66 No.11 pp.747-753, [doi:10.1136/oem.2008.043471](https://doi.org/10.1136/oem.2008.043471).

## Health and Economic Aspects of Ozone Pollution

This paper assesses the human health and economic impacts of projected 2000–2050 changes in ozone pollution in sixteen world regions. The report estimates that health costs due to global ozone pollution above pre-industrial levels by 2050 will be \$580 billion (€404 billion) and that mortalities from acute exposure will exceed 2 million. The authors find that previous methodologies underestimate the costs of air pollution by more than a third because they do not take into account the long-term, compounding effects of health costs.

**Source:** Selin et al, Global health and economic impacts of future ozone pollution; *Environmental Research Letters* 2009 No. 4 044014, [doi: 10.1088/1748-9326/4/4/044014](https://doi.org/10.1088/1748-9326/4/4/044014).

## Air Quality

### Ozone Sensitivity to NO<sub>x</sub> and VOC in Mexico City

The authors say that comparison of ambient concentrations of various nitrogen species with simulations suggests that ozone in Mexico City is probably VOC-sensitive. Past studies, based on observed morning VOC/NO<sub>x</sub> ratios, have concluded that ozone in Mexico City is NO<sub>x</sub>-sensitive.

**Source:** Torresjardon et al, Assessment of the Ozone-Nitrogen Oxide-Volatile Organic Compound Sensitivity of Mexico City through an Indicator-Based Approach: Measurements and Numerical Simulations Comparison; *Journal of the Air & Waste Management Association*, 2009, Vol.59 No.10 pp.1155-1172.

## Nanoparticles in a Vehicle Wake and Street Canyon

The distribution of nanoparticles after emissions from the tailpipe of a moving vehicle was studied. Results suggested that the effect of transformation processes was nearly complete within 1 s after emission due to rapid dilution in the vehicle wake. Street canyon measurements showed that in calm wind conditions traffic emissions reached the roadside in 45 ± 6 s.

**Source:** Kumar, Robins and Britter, Fast response measurements of the dispersion of nanoparticles in a vehicle wake and a street canyon; *Atmospheric Environment* Vol.43, Issue38, pp 6110-6118, [doi:10.1016/j.atmosenv.2009.08.042](https://doi.org/10.1016/j.atmosenv.2009.08.042).

## Characterisation of Particulate

### Comparative Toxicity of Size-Fractionated PM

A study from the US-EPA reports the toxicity of size-fractionated airborne particulate matter. The results suggest that PM of different size-specific chemistry might be associated with different toxicological mechanisms in cardiac and pulmonary tissues.

**Source:** Seung-Hyun Cho et al, Comparative Toxicity of Size-Fractionated Airborne Particulate Matter Collected at Different Distances from an Urban Highway; *Environmental Health Perspectives*, Vol.117 No.11 pp.1682-1689, [doi:10.1289/ehp.0900730](https://doi.org/10.1289/ehp.0900730).

### Characterisation of Ship Particulate Emissions

Key physicochemical characteristics of diesel exhaust particulates of sea-going ship emissions are presented in this paper with respect to morphology, microstructure, and chemical composition.

**Source:** Popovicheva et al, Ship particulate pollutants: Characterization in terms of environmental implication; *Journal of Environmental Monitoring*, 2009, Vol.11 Iss.11 pp.2077 - 2086, [doi: 10.1039/b908180a](https://doi.org/10.1039/b908180a).

### Review of Wood Smoke Characterisation

This paper reviews the present knowledge on physicochemical properties of wood smoke particles from different combustion conditions in relation to wood-smoke induced health effects.

**Source:** Kocbach Bolling et al, Health effects of residential wood smoke particles: the importance of combustion conditions and physicochemical particle properties; *Particle and Fibre Toxicology* 2009, 6:29, [doi:10.1186/1743-8977-6-29](https://doi.org/10.1186/1743-8977-6-29).

## Engine Development and Emissions Measurement

### Nanoparticle Emissions from SI and CI Engines

Two latest generation engines, one spark-ignited and the other compression-ignited, were used to compare particulate emissions on different fuels. The results showed that particle number peaked within the range of 10-300 nm under all engine operating conditions, regardless of engine combustion type.

**Source:** Lee et al, Effect of Biofuels on Nanoparticle Emissions from Spark- and Compression-ignited Single-cylinder Engines with Same Exhaust Displacement Volume. *Energy & Fuels*, Vol. 23 Iss.9 pp.4363-4369, [doi: 10.1021/ef9004708](https://doi.org/10.1021/ef9004708).

## TU Munich developing Ultra-clean Diesel Combustion

Researchers at the Technical University of Munich say they are close to meeting Euro 6 emissions levels without exhaust gas aftertreatment. Their test engine uses an external compressor to supply the intake/EGR mixture at up to 10 bar. The fuel injector operates at up to 3000 bar to produce droplets small enough to not result in soot formation. Very careful balancing of EGR, boost and injector settings results in controlled combustion temperatures that minimise NO<sub>x</sub> formation. The researchers say the engine is to be further improved because the issue of micro-particles is particularly problematic.

**Source:** [http://portal.mytum.de/pressestelle/pressemitteilungen/news\\_article.2009-12-01.8876080430](http://portal.mytum.de/pressestelle/pressemitteilungen/news_article.2009-12-01.8876080430).

## Interactions of Emissions

### Marine Fuel Sulfur Reduction and Global Warming

A new paper says that shipping is slowing climate change but the use of cleaner, low sulfur, fuels may increase global warming. The study estimated that it would take roughly 70 years for shipping to become a net contributor to global warming if SO<sub>2</sub> emissions were quickly cut by 90% and all other fuel-related emissions stayed at 2000 levels.

**Source:** Fuglestvedt et al, Shipping emissions: From cooling to warming of climate and reducing impacts on health; *Environmental Science and Technology*, doi: [10.1021/es901944r](https://doi.org/10.1021/es901944r).

### N<sub>2</sub>O now causes most Damage to Ozone Layer

According to new research, emissions of anthropogenic nitrous oxide (N<sub>2</sub>O) are now causing more damage to the ozone layer than those of any controlled ozone depleting substance and this is projected to remain the case for the rest of this century. The study suggests that limiting N<sub>2</sub>O emissions could help both the recovery of the ozone layer and tackle climate change.

**Source:** Ravishankara, Daniel and Portmann, Nitrous Oxide (N<sub>2</sub>O): The Dominant Ozone-Depleting Substance Emitted in the 21st Century; *Science*, Vol.326 No.5949 pp123-125, doi: [10.1126/science.1176985](https://doi.org/10.1126/science.1176985).

### Methane Emissions' Impact on Climate Change

In this study, researchers investigated the complex interactions between greenhouse gases (GHGs) and aerosols in the atmosphere. In particular, they considered the impact on climate warming when methane, CO and NO<sub>x</sub> compete with aerosols for hydroxyl in the atmosphere. It was found that the relative warming caused by methane over a 100-year time scale is approximately 10% greater than commonly recognised. The impact of methane warming increases to between 20 and 40% when the indirect effects of aerosols on clouds are considered.

**Source:** Shindell, et al, Improved Attribution of Climate Forcing to Emissions. *Science* Vol.326 No.5953, pp.716-718, doi: [10.1126/science.1174760](https://doi.org/10.1126/science.1174760).

## **FORTHCOMING CONFERENCES**

### **Ship Propulsion Systems Conference**

27-28 January 2010, London, UK

Details at [www.imarest.org/Newsroom](http://www.imarest.org/Newsroom)

*This conference will address the technical and operational challenges to providing the most reliable, efficient and clean ship propulsion systems. It will cover the new requirements for reduced levels of propulsion-related emissions and how to achieve them, alternative fuels and practical alternatives to diesel, and "efficiency and environmental protection - complementary or conflicting technologies?"*

### **6<sup>th</sup> ACEM Conference – EU2020: making it happen. Which industrial policy for the motorcycle sector?**

28 January 2010, Brussels, Belgium

Details at [www.acem.eu/publiq/conf2009.html](http://www.acem.eu/publiq/conf2009.html)

*"The ACEM Annual Conference provides the opportunity to have an overview of the motorcycle sector, and engage policy-makers, professionals and company managers in productive discussions – so that current challenges may be turned into opportunities". The conference will be chaired and moderated by MEP Bernd Lange.*

### **Electric Vehicles at the Crossroads: Towards a Comprehensive EU-Wide Strategy**

18 February 2010, Brussels, Belgium

Details at <http://awbriefing.com/events/10-02-18.php>

*Speakers include Mr. Frederic Sgarbi, Head of the European Commission's Sustainable Surface Transport Unit, Mr. Helmut Morsi, Head of the International Transport Relations and trans-European Transport Network Policy Unit, Ms. Nusa Urbancic, policy officer in DG-TREN responsible for Energy Transformation and Renewables in Transport and Mr. Rolf Stromberger, ACEA's Director of Environment and Economics.*

### **GreenPort 2010**

23-25 February 2010, Stockholm, Sweden

Details at [www.green-port.net](http://www.green-port.net)

*Delegates will discuss key port environmental issues such as Climate Change, Port Authorities' green initiatives, the Port-City Relationship, Port Technology and Renewable Energy. The results of the Port Environmental Review 2009 by ESPO/EcoPorts, which will form the basis for updating the ESPO Environmental Code of Practice, will be announced.*

### **16<sup>th</sup> Annual Fuels & Lubes Asia Conference**

3-5 March 2010, Singapore

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

*The theme of the conference is "Fuel Economy and Emissions: Exploring beyond Today's Limitations".*

## **6<sup>th</sup> International Exhaust Gas and Particulate Emissions Forum**

9-10 March 2010, Ludwigsburg, Germany

Details at [www.forum-emissions.com](http://www.forum-emissions.com)

*Experts from vehicle and engine manufacturers, suppliers, development suppliers and science will report on the most recent status and the forthcoming concepts regarding exhaust gas emission reduction. Discussion topics will include particle counters, sensor technology and OBD.*

## **International Advanced Mobility Forum 2010**

9-10 March 2010, Geneva, Switzerland

Details at [www.iamf.ch/en](http://www.iamf.ch/en)

*Topics will include advanced powertrain technologies; alternative powertrain systems in motorsport; energy storage in the vehicle and its fuelling/charging infrastructure; advanced vehicle technologies; and market introduction of new technologies.*

## **11<sup>th</sup> Annual European Fuels Conference**

9-12 March 2010, Paris, France

Details at [www.wraconferences.com/2/4/articles/69.php](http://www.wraconferences.com/2/4/articles/69.php)

*There will also be a pre-conference Alternative Fuels Symposium and a post-Conference CO<sub>2</sub> & Energy Efficiency Forum.*

## **7<sup>th</sup> Green Ship Technology Conference**

16-17 March 2010, Copenhagen, Denmark

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

*The conference will highlight developments in technology to reduce the environmental impact of shipping (including curbing air emissions), and help ship-owners and operators achieve greater efficiencies and energy savings.*

## **Diesel Emissions Conference/AdBlue Forum Asia**

23-25 March 2010, Beijing, China

Details at [www.integer-research.com/decasia](http://www.integer-research.com/decasia)

*Key regulators, Asian vehicle manufacturers and leading emissions reduction technology suppliers will explore the most successful strategies to meet Asian diesel emissions legislation now and in the future.*

## **SAE 2010 World Congress**

13-15 April 2010, Detroit, Michigan, USA

Details at [www.sae.org/congress](http://www.sae.org/congress)

## **31<sup>st</sup> International Vienna Motorsymposium**

29-30 April 2010, Vienna, Austria

Details at [www.övk.at/index\\_en.htm](http://www.övk.at/index_en.htm)

*Latest results in worldwide engine and powertrain development, future legislation, new engines, fuels and powertrain components, hybrid technology, CO<sub>2</sub> reduction and exhaust emissions control.*

## **AVL Large Engines TechDays**

5-6 May 2010, Graz, Austria

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

## **Busworld Asia**

6-8 May 2010, Shanghai, China

Details at [www.busworld.org](http://www.busworld.org)

## **Leapfrogging Opportunities for Air Quality Improvement**

10-14 May 2010, Xi'an, Shaanxi Province China

Details at [www.dri.edu/leapfrogging-opportunities-for-air-quality-improvement](http://www.dri.edu/leapfrogging-opportunities-for-air-quality-improvement)

*Major topics will include methods for regional and urban emission inventories, ambient and source characterisation techniques, air quality modelling applications, emission control technologies, and air pollution and health effects.*

## **18<sup>th</sup> International Symposium on Transport and Air Pollution**

18-19 May 2010, Dübendorf, Switzerland

Details at

[www.empa.ch/plugin/template/empa\\*/86139/---/l=2](http://www.empa.ch/plugin/template/empa*/86139/---/l=2)

*The aim of the symposium will be to bring together scientists, users and policy makers to assess the current scientific knowledge of air pollution due to emissions from transportation systems.*

## **Motorisation Diesel, face au défi de la compétitivité / Diesel engines, facing the competitiveness challenges**

26-27 May 2010, Rouen, France

Details at [www.sia.fr/](http://www.sia.fr/)

[evenement\\_detail\\_motorisations\\_diesel\\_face\\_au\\_1044.htm](http://evenement_detail_motorisations_diesel_face_au_1044.htm).

*The diesel engine is considered as one of the future methods for low CO<sub>2</sub> emissions, but reducing pollutant emissions has made the price one of growing complexity. New approaches will be necessary to continue development of these engines.*

## **33<sup>rd</sup> FISITA World Automotive Congress**

30 May - 4 June 2010, Budapest, Hungary

Details at [www.fisita2010.com](http://www.fisita2010.com)

*Top experts from the automotive community around the world will review the latest technical breakthroughs and innovations and show the world that our future mobility depends on engineers.*

## **9<sup>th</sup> International Symposium on Combustion Diagnostics**

8-9 June 2010, Baden-Baden, Germany

Details at [www.combustion-diagnostics.com](http://www.combustion-diagnostics.com)

*Developers make use of a combination of sophisticated tools from simulation, and from indicating and visual instrumentation. These are not*

limited to the combustion chamber, but also require verification along the entire gas exchange, fuel mixture generation and exhaust aftertreatment path.

### **Metrology of Airborne Nanoparticles, Standardisation and Applications (MANSA)**

8-10 June 2010, Teddington, UK

Details at [www.npl.co.uk/events/mansa](http://www.npl.co.uk/events/mansa)

*This meeting will cover the major applications, including vehicle emissions measurement, that stand to benefit from improved comparability and accuracy, and will cover the scope for future metrology research and standardisation through ISO and CEN. Discussions will focus on measurement of airborne number concentration, size distribution, surface area and related measurands. Recent and future instrument inter-comparisons will be presented.*

### **5<sup>th</sup> Emission Control 2010**

10-11 June 2010, Dresden, Germany

*The main emphasis of the conference will be on measures to reduce emissions of Otto and Diesel engines, together with energy and heat management.*

### **CIMAC (International Council on Combustion Engines) Congress 2010**

14-17 June 2010, Bergen, Norway

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

*12 technical sessions include product development – diesel engines and environment, fuel & combustion.*

### **3<sup>rd</sup> International MinNOx (Minimising NOx emissions through exhaust aftertreatment)**

29-30 June 2010, Berlin, Germany

Details at [www.iav.com/us/4\\_events/iav\\_conferences.php?we\\_objectID=16007](http://www.iav.com/us/4_events/iav_conferences.php?we_objectID=16007)

**Deadline for abstracts: 29 January 2010**

*IAV is asking for papers on NOx storage catalysts and SCR, EGR systems, diagnostics, combustion processes, system integration and cost optimisation, fuel and environmental impacts, and practical experience with use in mass production. Applications should cover direct-injection spark ignition engines, commercial vehicles and off-road vehicles.*

### **Busworld Russia**

30 June - 2 July 2010, Nizhny Novgorod, Russia

Details at [www.busworldrussia.ru](http://www.busworldrussia.ru)

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

2-4 August 2010, Zurich, Switzerland

Details at [www.lav.ethz.ch/nanoparticle\\_conf/](http://www.lav.ethz.ch/nanoparticle_conf/)

### **VPPC 2010: Vehicle Power and Propulsion Conference**

1-3 September 2010, Lille, France

Details at <http://vppc2010.univ-lille1.fr>

*The 2010 Vehicle Power and Propulsion Conference will be held in the framework of the French network on hybrid electric vehicles (HEVs). The conference aims to provide a forum for sharing knowledge, experience and creative ideas in vehicle power and propulsion in order to develop and promote "clean technology" for future transportation systems.*

### **22<sup>nd</sup> International AVL Conference 'Engine & Environment'**

9-10 September 2010, Graz, Austria

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

*This year's topic is "The Innovative Internal Combustion Engine in the Context of Powertrain Electrification – A Major Key to Long-Term CO<sub>2</sub> Reduction"*

### **19<sup>th</sup> Aachen Colloquium "Automobile and Engine Technology"**

4-6 October 2010, Aachen, Germany

Details at [www.aachener-kolloquium.de/index\\_e.htm](http://www.aachener-kolloquium.de/index_e.htm)

*The congress will provide a wide range of technical presentations addressing current challenges of the vehicle and powertrain industry. Programme-related test vehicles, prototypes and aggregates from participating companies and institutions will be presented on the ika test track.*

### **SAE 2010 Commercial Vehicle Engineering Congress and Exhibition**

5-6 October 2010, Rosemont, Illinois, USA

Details at [www.sae.org/events/cve/cfp.htm](http://www.sae.org/events/cve/cfp.htm)

**Deadline for abstracts: 27 February 2010**