AECC

Newsletter

March - April 2009

INTERNATIONAL REGULATORY DEVELOPMENTS

Table of Contents

Association for Emissions Control by Catalyst AISBL

Diamant Building
Boulevard A. Reyers, 80
B-1030 Brussels
Belgium

Tel: +32 2 706 81 60
Fax: +32 2 706 81 69
info@aecc.eu
www.aecc.eu

EUROPE

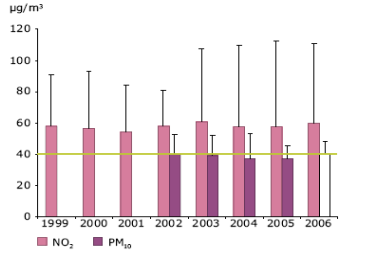
Reports on European Air Quality and the Effect of Transport

The European Environment Agency (EEA) has issued a report on "*Spatial assessment of PM_{10} and ozone concentrations in Europe (2005)*" as their technical report No 1/2009.

The report says that one in four Europeans endured many days of frequent and high concentrations of particulate matter (PM_{10}) in 2005. In addition to these daily peaks above EU thresholds, one in ten Europeans was exposed throughout the year to persistent PM_{10} levels higher than the EU's annual mean limit. The report records similar findings for ground-level ozone, with more than a third of the European population exposed to ozone levels higher than the EU's target value. The report is at www.eea.europa.eu/publications/spatial-assessment-of-pm10-and-ozone-concentrations-in-europe-2005-1.

A second report (technical report No 2/2009) covers "*Air pollution by ozone across Europe during summer 2008*". The report says that according to several indicators, ozone levels during the summer of 2008 were the lowest since 1997. Nevertheless, all EU Member States and eight other European countries exceeded the long-term objectives set by EU legislation. With measurements of 399 and 302 µg/m^3, the highest one-hour concentrations were recorded in the Lazio region in Italy. Several measuring stations in Belgium, Greece, Italy, Spain and Switzerland also reported high concentrations of between 240 and 300 µg/m^3. This report can be downloaded from www.eea.europa.eu/publications/air-pollution-by-ozone-across-europe-during-summer-2008-1.

A third EEA report covers transport and environment indicators for 2008. The report says that emissions of regulated air pollutants from vehicles continue to fall across EEA member countries but concentrations remain high in some urban areas. It comments that Euro 5 is expected to reduce particulate emissions from diesel cars by 80% compared to Euro 4 and Euro 6 should significantly reduce NOx from diesel cars.



Note: Columns indicate mean values while error bars indicate maximum values.

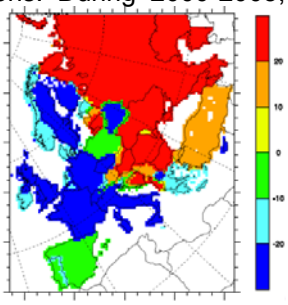
Source: European Topic Centre for Air and Climate Change, 2008.

There are low emission zones (LEZs) operating in 70 cities across eight countries. EEA says that although these schemes can act as an effective driver to accelerate fleet renewal and encourage new cleaner technologies, there is a strong need to harmonise standards across Europe. That includes standardising the vehicles permitted to enter LEZs, unification of LEZ signing across Europe and regulations on how to deal with foreign vehicles.

Maritime emissions of SOx and NOx are expected to be larger than land-based emissions in the near future. Methods to assign marine emissions to countries must be developed and agreed, the report says. A benchmarking approach could be useful to reduce the emissions from this sector. The report is at www.eea.europa.eu/publications/transport-at-a-crossroads.

Another study, from Norwegian, Greek and Scottish research institutes and partly conducted under the EU's CARBOSOL project, says that European policies to reduce NO_x emissions from road transport have been effective, despite an increase in vehicle fuel consumption between 1990 and 2005.

Overall, NO_x emissions increased by 13% between 1980 and 1990 and peaked in 1990. During 1990-2000, emissions from the traffic sector then fell across Europe by 23% overall as new regulations and technologies reduced emissions. During 2000-2005, road transport emissions in Western Europe became decoupled from fuel consumption and continued to fall as a result of regulations. In contrast, emissions in Eastern Europe rose due to increased prosperity, and largely due to increases in road transport.



Difference in road transport emissions (Mg) between 2000 and 2005

The researchers suggest that with the next generation of emissions standards to limit NO_x and PM from road vehicles (especially Euro 6), NO_x emissions will continue to fall for both petrol and diesel vehicles. However, time delays of up to eight years can be expected in some countries for regulations to become fully effective, as the vehicle fleet is replaced.

Source: Vestreng et al, Evolution of NO_x emissions in Europe with focus on road transport control measures; *Atmospheric Chemistry and Physics* (2009) 9:1503-1520. The full paper can be downloaded from www.atmos-chem-phys.net/9/1503/2009.

European Council agrees Directive on Promotion of Clean Vehicles

The EU's Transport, Telecommunications and Energy Council has adopted the Directive on the promotion of clean and energy-efficient road transport vehicles. The Directive has already been agreed by the European Parliament.

The Directive requires authorities and operators of public service contracts to take the cost of lifetime

energy and environmental impacts (including energy consumption, CO_2 and NOx, NMHC and PM emissions) into account when purchasing a vehicle. The emissions costs for road transport are defined (in 2007 prices) in the following table:

CO_2	NOx	NMHC	Particulate
0.03-0.04 €/kg	0.0044 €/g	0.001 €/g	0.087 €/g

The lifetime to be used for these calculations is also defined. For passenger cars it is 200 000 km; 250 000 km for light commercial vehicles (N1 category); 800 000 km for buses (M2 and M3 categories); and 1 000 000 km for heavy goods vehicles (N2 and N3).

European Council adopts Car CO_2 Regulation

The Council of Ministers has also adopted the EU's climate-energy legislative package which includes the new Regulation on car CO_2 emissions.

The package is designed to achieve the EU's overall environmental target of a 20% reduction in greenhouse gases and a 20% share of renewable energy in the EU's total energy consumption by 2020. It includes the Regulation which will set a binding standard of 130 g/km (average) for CO_2 emissions from new passenger cars by 2015; revisions to the fuel quality Directive, including higher levels of biofuels; and new rules promoting the use of energy from renewable sources, part of which is a 10% target for use of renewable energy sources in transport.

EU's Joint Research Centre opens Heavy-duty Vehicle Emissions Laboratory

On Friday 13 March 2009, the European Commissioner for Science and Research, Janez Potočnik, opened the new "VELA 7" facility for testing fuel consumption and emissions of heavy-duty trucks and buses at the European Commission's Joint Research Centre (DG-JRC) in Ispra, Italy.

The new installation simulates wind drag, tyre/road friction and full drive cycles for real-life articulated lorries of up to 40 tonnes or 12 m-long buses.

The programme for the event included a press conference with the Commissioner and the President of the Lombardy Region and the possibility of driving a car equipped with a portable emissions measurement system (PEMS) to experience the impact of driving behaviour on emissions and fuel consumption.

German and Italian Campaigns for Particulate Filters

In Germany, Deutsche Umwelthilfe, Bund für Umwelt und Naturschutz Deutschland, Naturschutzverband and the Association of Transport and Environment (VCD) have launched a joint awareness campaign to inform people on the climate effects of fine particles.

The organisations say that, based on results of a recent study by climatologist James Hansen, director of the NASA Goddard Institute of Space Studies, not only are fine soot particles harmful to health, but they have three distinct effects leading to a strengthening of global warming in the Arctic. Grey particles deposit on the ice surface and reduce sunlight reflection and accelerate sea-ice melting. Secondly, black ultra-fines warm up in the sun and diffuse into the air the heat they absorb. Finally, they affect cloud formation, altering the quantity and distribution of rainfall. The campaign objective is to eliminate almost completely fine particles emissions from diesel engines used by road transport and in off-road applications.

In Italy, activists of the Italia Nostra environmental association have called for the end of exemptions to the 'Ecopass' for Euro 4 and 5 vehicles without particulate filters. The Ecopass allows access to environmental zones in the Valle d'Aosta region. They say that a Euro 4 diesel SUV emits 68 mg/km PM compared to the 24 of a Euro 3 petrol car – yet the owner of the SUV does not have to pay for an Ecopass whereas the owner of the petrol car does.

UK may not meet NO_2 Air Quality Limits even in 2015

A draft paper from the UK Environment Department (DEFRA), shows that 35 of 43 regions and urban areas of the UK are expected to breach the EU's 40 $\mu g/m^3$ annual average NO_2 limit in 2010. Without further action the standard will still be breached along 849 of the UK's roads even in 2015, 60% of them in London. As background NO_2 is likely to account for almost 40 $\mu g/m^3$, local measures will not suffice. The UK has already requested a delay to PM_{10} standards.

Large-scale retrofitting of older vehicles, support for electric vehicles, and changing buses, waste lorries and other 'captive fleets' from diesel to gas or hybrid power 'might have to be implemented on a radical scale', says the report. Reducing emissions from small combustion plants, lower speed limits and scrappage incentives may also be considered. Away from the capital, most areas are expected to exceed the standard by only a small margin in 2015 without new measures. Although local measures such as rerouting lorries may suffice in some areas, they will not be enough in others, due to high background levels.

London Mayor urged to think again on Low Emissions Zone

The London Assembly called for the city's Mayor, Boris Johnson, to revoke his decision to suspend the next phase of the capital's Low Emissions Zone. A cross-party coalition called on the mayor to revoke the "reckless and irresponsible decision" to suspend the next phase of London's Low Emissions Zone (LEZ) and demanded that he proceeds with the next phase of the scheme in light of the UK's EU obligations on air quality standards. The scheme currently targets buses, coaches and the most polluting lorries over 3.5 tonnes. Phase 3 of the scheme was scheduled to start in October next year and would have affected 90 000 smaller vehicles, including vans and minibuses.

PM_{10} improves but NOx remains a Problem in North-Rhine Westphalia

Fine particulate (PM_{10}) pollution improved significantly in 2008, according to the Nordrhein-Westfalen (Germany) Landesamt für Natur, Umwelt und Verbraucherschutz (State Office for Nature, Environment and Consumer Protection).

The reduction in fine particulate pollution around steelworks and brown-coal power stations is specifically mentioned as an improvement, but even on roads with heavy traffic, there was a small decline in the fine particulate. Problems remain, though, with nitrogen oxides on busy routes, with peak values of up to 211 µg/m^3. Environment Minister Eckhard Uhlenberg emphasised that emissions of nitrogen oxides from transport must be reduced urgently. Only widespread use of new low-emission vehicles meeting the Euro 5 and Euro 6 standard will reduce crucial emissions, he said. Details are at www.lanuv.nrw.de.

French Report on Ambient Air Particles

The French Environment Agency AFSSET (Agence Française de sécurité sanitaire de l'environnement et du travail), has published a report, commissioned by the Ministries of Ecology and Health, on fine particle pollution and its health impact.

The opinion concludes that they can find no pollution threshold below which there would be no health impact. More frequent exposures to moderate levels of pollution have a greater impact than peak levels. The agency recommends giving priority to the reduction of pollution at source. Thresholds and alert information on particles do not give a substantial health benefit, but do allow vulnerable persons to be informed and to adapt their behaviour at peak times. The report is available for download from: www.afsset.fr/index.php?pageid=675&newsid=441&MDLCODE=news.

Swiss Report says Air Pollutant Levels Exceed National Standards

Concentrations of harmful air pollutants in Switzerland declined in 2008, although reported levels of nitrogen dioxide, ozone, and coarse particulate matter in the atmosphere remained above national norms in some areas, according to a report issued by the Swiss Federal Office of the Environment on 14 April 2009.

As in previous years, the average annual limit of 30 µg/m^3 NO_2 was exceeded mainly in urban areas and along major traffic routes. Most exceedences of the 80 µg/m^3 daily limit were also in these areas, but reported levels from many rural stations were below the national limit, particularly at higher altitudes.

In towns and suburban areas, the 2008 annual PM_{10} average was between 18 and 28 µg/m^3, while in rural areas and along traffic routes levels of 21-22 µg/m^3 were reported by some stations. The Swiss average annual maximum limit is 20 µg/m^3. The daily average PM_{10} limit of 50 µg/m^3 was exceeded on between 6 and 30 days in 2008 at reporting stations in urban and suburban areas, with a maximum of 127 µg/m^3 registered at one station. Measuring stations in rural areas reported the daily limit being exceeded on between 10 and 14 days, with the highest registered concentration at 89 µg/m^3.

EU Incentive and Scrapping Schemes

The European motor industry association ACEA has published a summary of vehicle scrapping schemes in the EU Member States. There is a table showing the level and duration of incentives, conditions and required vehicle age at www.acea.be/images/uploads/files/20090406_Scrapping_schemes.pdf. In addition there is a map-based summary at www.acea.be/images/uploads/files/20090407_map_on_fleet_renewal_schemes.pdf.

Recently agreed schemes include one in the Netherlands which will offer €750 or €1000 for scrapping and replacing older cars and €1000 or €1750 for old vans. The replacement vehicle must be no older than 1 January 2001 in the case of petrol vehicles or must be fitted with an original-equipment particulate filter in the case of diesels. Slovakia has announced aid of €1000 for purchase of a replacement vehicle when scrapping one manufactured before 1 January 1999. Germany has also extended the funding available for its scheme and Poland is reported to be considering a scheme that would offer a ZL5000 (€1130) rebate for scrapping an old car, provided its replacement emits no more than 155 g/km CO_2. The UK will offer £2000 (€2248) if owners scrap a car 10 years old or more for a new model. The scheme will end in March 2010.

The UK has announced that from 2011 it will offer incentives of up to £5000 (€5600) to encourage motorists to buy electric or plug-in hybrid cars. The plan also sets aside £20 million for charging points and infrastructure to develop a network of what the government calls 'electric car cities'. Slovenia has extended tax advantages for the purchase of lorries meeting at least Euro V and buses meeting at least Euro IV. These will now be available to owner-operators as well as registered haulage companies.

Danish Action Plan on Maritime Air Pollution

Denmark has launched an action plan for reducing atmospheric emissions from shipping, in large part through the development and installation of environmentally friendly technology.

The action plan has ten key activities in three focus areas: mapping of shipping's contribution to air pollution, development of environmental technology and know-how aimed at reducing emissions of sulfur, nitrogen and particulates from shipping, and contributions to Danish and international legislation. Funding is to be made available for a number of commercial R&D projects involving retrofits to older engines, exhaust scrubbing, and cleaner fuels, targeting particulates, SOx and NOx.

Proposal for a Ship Environmental Index

Environmental research and consulting firm CE Delft has developed an Environmental Ship Index (ESI) at the request of the ports of Le Havre, Antwerp, Rotterdam, Bremen and Hamburg. The index is intended to be used from 2010 on a voluntary basis to define environmentally friendly shipping. The proposal includes emissions of NOx and SOx, and reporting of the IMO-energy efficiency operational index. The inclusion of particulate matter in the index is, says CE Delft, not yet possible. The report is at www.ce.nl/art/uploads/file/7848_finalreport.pdf?PHPSESSID=0ea29541b5a0cd0cef001b7224a45fe5.

VERT™ Association founded

The VERT™ Association was founded on 20 February 2009 as a non profit-organisation under Swiss Law. The founders of the association will test and certify particulate filters to the Swiss VERT procedures and have registered the trade marks "VERT", "VERT-DPF" and "VERT-certification" and the internet domains www.vert-dpf.eu and www.vert-certification.eu. The home pages will list those filters for which a licence to use VERT trademarks has been granted. For this the test results must be positive and the licensee has to agree to submit to the VERT association rules.

NORTH AMERICA

US and Canada propose Emissions Control Area for Shipping

The United States and Canada have become the first countries to ask the International Maritime Organization to create an Emissions Control Area (ECA) around their nation's coastline. The proposal was submitted to the IMO on 27 March 2009.

Beginning in 2015, fuel used by all vessels operating in ECAs cannot exceed 1000 ppm sulfur. This requirement is expected to reduce PM and SOx emissions by more than 85%. Beginning in 2016, new engines on vessels operating in ECAs must meet Tier III NOx emissions standards. These engines will have to use emissions controls that achieve an 80% reduction in NOx emissions, relative to Tier II.

EPA is, in parallel, developing a programme to address emissions from ocean going vessels under the National Clean Diesel Campaign and the Clean Ports Program. EPA is also developing standards for Category 3 marine diesel engines (engines >30 litres per cylinder), similar in stringency to the Tier III NOx standards that will apply to all engines in the ECA. EPA plans to issue a Notice of Proposed Rulemaking in Spring 2009 and finalise it by December 2009.

US Developments on Greenhouse Gas Emissions

EPA clears way to Regulate Greenhouse Gases

The US Environmental Protection Agency has opened the way to regulating US greenhouse gas (GHG) emissions by declaring climate-warming pollution a danger to human health and welfare.

In its announcement, EPA said, "greenhouse gases in the atmosphere endanger the public health and welfare of current and future generations". The finding said that high atmospheric concentrations of greenhouse gases "are the unambiguous result of human emissions, and are very likely the cause of the observed increase in average temperatures and other climatic changes." EPA's finding is essential for the US government to regulate GHG emissions under the Clean Air Act. EPA's declaration was also seen as a strong signal to the international community that the US intends to seriously combat climate change.

Senators call for EPA to study Black Carbon

Two US Senators have introduced a new bill that would direct the EPA to study the effect that 'black carbon' has on the climate, and to recommend "effective control strategies" for reducing the emissions. The bill identifies two potential areas where significant black carbon emission reductions

could take place for EPA to examine: "diesel particulate filters on existing diesel on- and off-road engines" and "particulate emission reduction measures for marine vessels." EPA did not include black carbon emissions in its climate change finding because of uncertainty about the pollutant's contribution to global warming, but said it would address the issue at a later date.

EPA proposes GHG Emissions Registry

On 10 March 2009, EPA issued a proposal to establish a national system for reporting greenhouse gas (GHG) emissions produced by major sources, including fuel and chemical suppliers and manufacturers of motor vehicles and engines. Under the proposal, vehicle and engine manufacturers would begin reporting for model year 2011.

Manufacturers of vehicles and engines would need to report both GHG emissions associated with their manufacturing facilities and CO_2, methane, and nitrous oxide emissions from the engines or vehicles they produce. These would have to be reported for all current certification test cycles plus, for Tier 2 light-duty vehicles, air conditioning-related CO_2 emissions using a new test procedure.

Proposal for Energy and Climate Legislation

The Chairs of the US Congress's Energy and Commerce Committee, and Energy and Environment Subcommittee have released a draft of a legislative proposal to limit greenhouse gas emissions, promote the use of renewable fuels, and promote energy efficiency. The draft includes a change to the Clean Air Act to direct the US Environmental Protection Agency (EPA) to develop greenhouse gas emissions standards for all mobile sources and to harmonise fuel economy and GHG emissions standards for light-duty vehicles with California. It also requires the establishment of a national low carbon fuel standard to promote renewable biofuels, and requires electric companies to develop charging infrastructures for plug-in electric/hybrid vehicles.

New US Fuel Economy Standards

The US Department of Transportation (DOT) has issued new fuel economy standards for passenger cars and light-duty trucks for the 2011 model year. The new standards will improve the combined Corporate Average Fuel Economy (CAFE) for cars and light trucks to 27.3 miles per gallon (mpg) (8.6 litres/100 km) - a 2.0 mpg increase over the 2010 model year average. Cars will have to meet a 30.2 mpg (7.8 litres/100 km) standard and light trucks 24.1 mpg (9.76 litres/100 km), equivalent to CO_2 emissions of 184 g/km and 230 g/km, respectively.

EPA sets GHG Goals for Diesel Program

EPA is urging applicants for diesel engine retrofit funds to quantify the greenhouse gas (GHG) emission reduction that retrofit projects may achieve.

The US 'stimulus law' provides an additional $206 million (€155 million) for EPA's existing diesel emissions grants programmes, which fund activities such as installing technologies verified to reduce engine idling or the purchase of vehicles retrofitted to reduce emissions. EPA is encouraging, but not requiring, applicants to quantitatively estimate a project's annual GHG reductions.

California proposes Changes to OBD Requirements

The California Air Resources Board (CARB) has issued a staff report detailing proposals to modify on-board diagnostic (OBD) requirements for medium- and heavy-duty diesel engines. Some of the main elements are as follows:

For 2010 to 2012 model years, the PM filter threshold would be relaxed and the requirement to monitor NMHC performance would be delayed to 2013. For PM filter regeneration events there would be a NOx emission threshold of 0.2 g/bhp-hr above the NOx limit, from 2013 model year.

For the 2010-2012 model years, the NOx emission threshold for systems using active reductant is increased from 0.3 g/bhp-hr above the relevant NOx limit to 0.4 g/bhp-hr above it. For the 2013 model year threshold remains at 0.2 g/bhp-hr above the limit value of 0.2 g/bhp-hr. The threshold is unchanged for NOx adsorber systems.

The proposal also delays, until 2013, the requirement to monitor the NO_2 conversion of oxidation catalysts used to adjust the NO_2/NO ratio upstream of SCR catalysts. Also from 2013 model year, CARB proposes requiring the monitoring of EGR catalysts for oxidation performance and adding an NMHC emission threshold of twice the applicable NMHC standard for all NOx catalysts. The proposals are at www.arb.ca.gov/msprog/obdprog/hdobdreg.htm.

Change to California Fleet Average Limits for Large Spark Ignition Engines

The California Air Resources Board (CARB) has indicated that fleet owners may exclude certain large spark-ignition (SI) engines >25 hp from their fleet average emissions calculations.

The operators may exclude uncontrolled engines greater than 3 litres in displacement from the required fleet average emissions calculations until 15 April 2010. This is because no manufacturers have

yet certified such an engine with HC+NOx emissions below 2.0 g/bhp-hr and, to date, only one retrofit kit has been verified for these engines at 3.0 g/bhp-hr. Such engines are used in forklift trucks, airport ground support equipment and road sweepers. The full CARB guidance document on large SI engines is at www.arb.ca.gov/msprog/offroad/orspark/orspark.htm.

California adopts Low Carbon Fuel Standard

The California Air Resources Board (CARB) has adopted a Low Carbon Fuel Standard intended to achieve a 10% reduction in greenhouse gas emissions from transport fuels by 2020. The standard sets 'carbon intensity' targets for each year, based on a well-to-wheel approach. The baseline gasoline is a reformulated E10 gasoline using corn ethanol and the baseline diesel is ULSD (ultra-low sulfur diesel). The standard includes a system of credits and debits that may be generated, banked, and traded within the fuel market. CARB will review the standard every 3 years.

US 'State of the Air' Report

According to the American Lung Association, 60% of US residents – 186 million people - live in areas with dangerous levels of air pollution, even though many major cities improved air quality over the last decade.

But even with these improvements, residents of some of these cities are breathing dirtier air than in previous years, the lung association said. The report noted that some of the biggest sources of air pollution, such as power plants, current diesel engines and ocean-going vessels, also worsen global warming.

In its annual "State of the Air" report, the association says that the air in many US cities became dirtier last year, despite almost 40 years since the Clean Air Act was passed in 1970. Los Angeles was ranked as the city with the worst ozone pollution, a position it has held for nine of the past 10 years. Bakersfield, California, was worst for year-round particle pollution and Pittsburgh, Pennsylvania, was worst for short-term particle pollution.

EPA announces Air Pollution Monitoring near Schools

In response to recent media reports raising questions about air quality outside schools that are near large industrial facilities, the new US Environmental Protection Agency administrator Lisa Jackson has announced that EPA and State and local governments will start a new programme to measure air pollutants at schools near large industries and in urban areas.

Vancouver considering Diesel Emission Reduction Fund

Vancouver, Canada, is considering a staff recommendation to seek $35 million (€22 million) of government funding to establish a "diesel emission reduction fund" complementing their existing diesel retrofit/upgrade initiative. Metro Vancouver says about 8% of diesel emissions in the region are caused by motor vehicles, 8% by rail locomotives, 43% by marine engines, and 41% by other non-road engines.

Port of Oakland Approves Air Quality Plan

The Port of Oakland, California, has approved a plan for reducing emissions from mobile and stationary diesel engines at the port. The plan supports the Port Air Quality Statement adopted in 2008 by the Port Commissioners. This set a goal of reducing port diesel particulate emissions by 85% by 2020. The Maritime Air Quality Improvement Plan (MAQIP) focuses on reducing diesel particulate but includes goals for the reduction of nitrogen oxides. The plan aims to achieve the early retrofitting or replacement of trucks delivering to the port and the use of 'shore-side' electricity in place of auxiliary diesel engines.

Clean Diesel Projects for Connecticut

The Connecticut Department of Environmental Protection has announced three clean diesel projects. The three projects are a Diesel Vehicle Retrofit programme for some Department of Transportation diesel vehicles and construction equipment; a truck stop electrification project at the Port of New Haven to reduce idling emissions, and a locomotive repowering project to replace high-emitting diesel locomotive engines operated by the Providence and Worcester Rail Road with low-emissions generators and particulate filters. In addition, airport shuttle buses, snow-ploughing equipment, and dump trucks will also be evaluated for retrofits.

NESCAUM States to Retrofit Construction Equipment

The US Environmental Protection Agency (EPA) has awarded a grant for retrofitting of construction equipment in the NESCAUM region - the NorthEast States for Coordinated Air Use Management. The grant will enable retrofitting of diesel-powered equipment that is leased to construction projects throughout the region. NESCAUM will work with construction industry associations and with emissions control device manufacturers to target equipment rental companies and provide guidance in selecting technologies and suppliers.

US EPA awards Grants for Particulate Matter Research

The US Environmental Protection Agency (EPA) has awarded grants totalling $3.5 million (€2.6 million) to four Universities for research work on particulate matter. EPA says the work will build bridges between epidemiology and air quality engineering, and the collaboration could result in major advances in data, methods and tools to link health problems with sources and components of air pollution.

EPA Seeks Public Comment on US Ethanol Blend Rate

The US Environmental Protection Agency is seeking public comment on whether to increase the allowable level of ethanol in gasoline from 10% to 15%. Ethanol producers have petitioned EPA to raise the maximum blend level. In addition, the Energy Department estimates that by 2013, at a 10% blend rate, the amount of ethanol required to be produced under the Renewable Fuel Standard will exceed the amount the US vehicle fleet could consume. EPA must make a decision on the request by 1 December 2009.

SOUTH & CENTRAL AMERICA

Flex-fuelled Motorcycle for Brazil

Honda in Brazil has launched a motorcycle that can run on sugar cane ethanol, petrol or a mixture of both. Named the "Mix", the bike uses an oxygen sensor in the exhaust to determine what fuel is being burned and adjusts the action of the fuel injection unit appropriately. As with flex-fuel cars, it requires about 20% gasoline in the tank in colder regions for starting.

Costa Rica switches to 500 ppm Sulfur Diesel as Brazil starts 50 ppm

Euro 2 (500 ppm sulfur) diesel is now available at retail sites in Costa Rica, replacing the 2000 ppm sulfur diesel that had been the nation's standard fuel. The country has yet to set out a clear plan for conversion to ultra-low sulfur fuel, which would enable latest-generation diesel vehicles and emissions.

Meanwhile Brazil's Petrobras has produced its first batch of 'S50 diesel' (50 ppm sulfur), with one-tenth the sulfur of the country's previous diesel. Petrobras plans to start selling the new diesel at all of its service stations in the Belem, Fortaleza and Recife metropolitan areas starting in May 2009, enabling the use of modern diesel engines. The company expects to overhaul three other refineries so they can begin producing S50 next year.

ASIA PACIFIC

India publishes Bharat Stage IV

Notification for the Bharat Stage IV Indian emissions standards (equivalent to Euro 4) has been published in the Indian Gazette as the Central Motor Vehicles (Second Amendment) Rules 2009. The standards will come into force from 1 April 2010 in the major cities of India[1]. At the same time, the rest of the country will move to Bharat Stage III Standards.

BS-IV for light-duty vehicles:

Type Approval & Conformity of Production Limits (g/km)						
Category	Class †	CO	HC	NOx	HC+NOx	PM
Petrol						
M *	-	1.00	0.10	0.08	-	-
N1	I	1.00	0.10	0.08	-	-
	II	1.81	0.13	0.10	-	-
	II	2.27	0.16	0.11	-	-
Diesel						
M *	-	0.50	-	0.25	0.30	0.025
N1	I	0.50	-	0.25	0.30	0.025
	II	0.63	-	0.33	0.39	0.04
	II	0.74	-	0.39	0.46	0.06

* Vehicles designed to carry >6 people including driver or gross vehicle weight >2500 kg are to meet the standards for N category.
† N1 Class I: Reference Mass ≤1305 kg; N1 Class II: Reference Mass >1305 kg and ≤1760 kg; N1 Class III, Ref. Mass >1760 kg.

OBD I will be required from 1 April 2010 (except LPG or CNG-fuelled vehicles and those >3500 kg GVW). OBD II is required from 1 April 2013 for all categories.

BS-IV for engines for heavy-duty vehicles:

Type Approval & Conformity of Production Limits (g/kWh)					
	THC	NMHC	CH_4 *	NOx	PM
CNG or LPG engines					
ETC test	-	0.55	1.1	3.5	-
Diesel engines					
ESC test	0.46	-	-	3.5	0.02
ETC test	-	0.55	1.1	3.5	0.03
ELR test	Smoke <0.5m^{-1}				

* CNG only

The document also defines the Bharat Stage III limits for 2- and 3- wheelers from 1 April 2010 and the Bharat (Trem) Stage IIIA standards for tractors.

BS-III for 2- and 3-wheelers:

Type Approval & Conformity of Production Limit (g/km)			
Vehicle Category	CO	HC+NOx	PM
2-wheelers (petrol)	1.0	1.0	-
3-wheelers (petrol	1.25	1.25	-
2- & 3-wheelers (diesel)	0.50	0.50	0.05

Bharat (Trem) Stage IIIA for Tractors:

Type Approval & Conformity of Production Limit (g/kWh)				
Category	CO	HC+NOx	PM	Applies from
<8kW	5.5	8.5	0.8	1/4/2010
8≤kW<19	5.5	8.5	0.8	1/4/2010
19≤kW<37	5.5	7.5	0.6	1/4/2010
37≤kW<56	5.0	4.7	0.4	1/4/2011
56≤kW<75	5.0	4.7	0.4	1/4/2011
75≤kW<130	5.0	4.0	0.3	1/4/2011
130≤kW<560	3.5	4.0	0.2	1/4/2011

The test cycle is the ISO 8178 Part 4 (1996) 8-mode C1 cycle. Deterioration factors are 1.05 for HC and NOx, 1.1 for CO and PM. If an aging test is used to establish durability factors, the periods are 3000 hours for engines ≤19 kW, 5000 hours for >19 kW but ≤37 kW, and 8000 hours for engines >37 kW.

The document also provides deterioration factors and durability requirements for each pollutant and class of vehicles. It defines the specification of commercial 50 ppm regular and premium petrol, and CNG, LPG and 10 ppm petrol and diesel reference fuels.

[1] The Bharat Stage IV (BS-IV) rules apply in the National Capital region, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, and Secunderabad, Ahmedabad, Pune, Surat, Kanpur and Agra.

Hong Kong reviews Air Quality Measures

A consulting group commissioned by the Government of the Hong Kong Special Administrative Region has advised the adoption of minimum World Health Organization (WHO) air quality targets.

Ove Arup consultants recommended that Hong Kong adopt WHO's phase 1 interim goals for sulfur dioxide and ozone, and for fine suspended particles ($PM_{2.5}$), not previously included in Hong Kong's air quality measurements. The consultant also urged adoption of stricter phase 2 PM_{10} interim goals. A final report from the consultant is due in the second half of the year, to be followed by a full scale public consultation on the proposals, according to a government white paper.

In order to meet WHO air quality standards, the report recommended the adoption of 19 measures including:

- accelerating the replacement of pre-Euro, Euro I, and Euro II commercial diesel vehicles and buses;
- earlier adoption of Euro III emissions standards for commercial diesel vehicles;
- promoting more environmentally friendly vehicles;
- tightening vehicle emissions controls;
- introducing low-emission zones by banning pre-Euro and Euro I, Euro II, and Euro III commercial vehicles from certain areas.

China to add Ozone and Fine Particulates to Air Pollution Index

China's Ministry of Environmental Protection plans to add fine particulate ($PM_{2.5}$), ground-level ozone, and visibility indexes to its Air Pollution Index. The current standards, adopted 10 years ago, do not provide an accurate picture of the smog situation across the country, the Ministry said, especially in the Pearl River Delta, Yangtze River Delta, and the Beijing-Tianjin-Hubei province region where ozone and particulates are the heaviest and where the country's major development during the current 11th five-year plan has been focused.

The existing index measures sulfur dioxide, nitrogen dioxide, and particulate matter with a diameter of less than 10 microns (PM_{10}). China's smog in the worst-affected regions is mainly caused by particulate matter, the Ministry said, and there is more $PM_{2.5}$ because of the rapidly increasing number of cars.

Presenting a report on controlling air pollution to the top legislature, the Environmental Protection Minister said that under a draft plan to take effect from the beginning of the 12th Five Year Plan (2011-15), ensuring clean air will no longer be the task of a single city - it will be the responsibility of a cluster of cities whose pollutants affect each other. The plan is likely to include regional emissions caps.

Air Pollution in Dhaka, Bangladesh

An estimated 15 000 premature deaths, as well as several million cases of pulmonary, respiratory and neurological illness are attributed to poor air quality in Dhaka, according to the Air Quality Management Project (AQMP), funded by the government and the World Bank. The World Health Organization (WHO) says vehicular air pollution is a major cause of respiratory distress in urban Bangladesh.

According to the Department of Environment (DoE), airborne particulate levels reach 463 µg/m^3 in the city during the dry season - the highest level in the world. Mexico City and Mumbai follow Dhaka with 383 and 360 µg/m^3 respectively, the department says. WHO air quality guidelines (2005) recommend a maximum acceptable PM level of 20 µg/m^3; cities with levels of 70 µg/m^3 are considered highly polluted.

The phasing out of petrol-driven two-stroke auto-rickshaws in 2003 and their replacement with four-stroke versions using compressed natural gas significantly decreased the volume of air contaminants. But, according to DoE sources, a sharp increase in the number of vehicles and construction sites in 2004-2008 led to a deterioration in Dhaka's air quality. According to DoE, old, poorly serviced vehicles, brick kilns, dust from roads and construction sites, and industrial sites are the major sources of air pollution. Some 15 000 mostly reconditioned and second hand cars were sold in Dhaka in 2008.

International Test Centre in India

The International Centre of Automotive Technology (ICAT) has started its operations at Manesar in Haryana, India. ICAT is a notified testing agency and is working towards the development of automobile industry in the country. The new facilities will include a powertrain laboratory, engine dynamometers, an emissions laboratory with Euro V capability, and vehicle test tracks.

MIDDLE EAST

Study on Dubai Air Quality

A small-scale study on air pollution in Dubai carried out by *Gulf News* revealed that Deira, Garhoud and International City have the highest levels of sulfur dioxide and nitrogen dioxide. Karama, Media City and The Marina also ranked highly with some results higher than international standards' annual averages.

However, the Environment Department at Dubai Municipality, which has six monitoring stations around the city, said that the frequent smog visible over the city is not an indication of air pollution, and they have not yet reached conclusions on the source of pollutants. Nitrogen oxide is an issue on highways and the department believes Dubai suffers the most from PM_{10} due to its geographic location and high level of dust in the air from the surrounding desert landscape.

AFRICA

South African Oil Industry on Cost and Timing of Cleaner Fuels

Speaking at a seminar in Johannesburg, a representative of SAPIA - the South African Petroleum Industry Association - said that the move towards cleaner exhaust emissions would require investments of up to R40 billion (€3 billion) to upgrade existing refineries and change fuel specifications. Due to the long lead times involved in the conversion to cleaner fuel, it could take up to five years to complete the switch. Fuel produced in South Africa currently equates to that for the Euro 2 emissions standard. South Africa aims to reach the Euro 4 level by 2012. The National Association of Automobile Manufacturers of South Africa said the country had to move to the Euro 4 level by January 2012 to fully benefit from vehicle engine technology improvements.

RESEARCH

Health Effects of Emissions

Effects of $PM_{2.5}$ before Birth

An average increase in exposure to fine particles by about 30 µg/m^3 was found to bring about an average birth weight deficit of 97.2 g and length at birth of 0.7 cm. Male foetuses were shown to be more sensitive to prenatal $PM_{2.5}$ exposure.

Source: Jedrychowski et al, Gender differences in fetal growth of newborns exposed prenatally to airborne fine particulate matter; *Environmental Research,* doi: 10.1016/j.envres.2009.01.009.

Effect of Air Pollutants during Pregnancy

A second paper concludes that exposure to higher $PM_{2.5}$ levels during the 1st and 3rd trimesters significantly increased the risk of babies being small for their gestational age. An increased risk was also associated with 1st, 2nd and 3rd trimester NO_2 levels.

Source: Rich et al, Ambient air pollutant concentrations during pregnancy and the risk of fetal growth restriction; *J Epidemiol Community Health*, April 2009; doi:10.1136/jech.2008.082792.

Effects of PM on Cardiovascular System

In this review the authors consider the possible correlation between the short- and long-term effects of particulate exposure and the onset of cardiovascular disease, with possible mechanisms. They emphasise that adverse health effects depend on both the PM concentration and its particular internal composition.

Source: Polichetti et al, Effects of Particulate Matter (PM_{10}, $PM_{2.5}$ and PM_1) on the Cardiovascular System; *Toxicology,* doi:10.1016/j.tox.2009.04.035.

Traffic Exposure may trigger Heart Attacks

Researchers found patients to be more than three times as likely to have been in traffic within an hour of the onset of their heart attack. They observed small but statistically significant increases in the chance of it occurring within 6 hours of exposure to traffic.

Source: Peters, von Klot, Mittleman, Meisinger and Wichmann, American Heart Association 49th Annual Conference on Cardiovascular Disease Epidemiology and Prevention.

Particles worsen Emphysema in Mice

This paper investigates the effects of 2 months chronic exposure to ambient levels of particulate on the development of protease-induced emphysema. The authors conclude that it is worsened by exposure to urban levels of PM and the response is influenced by an increase in oxidative stress from PM exposure.

Source: Lopes et al, Exposure to ambient levels of particles emitted by traffic worsens emphysema in mice; *Environmental Research*, doi:10.1016/j.envres.2009.03.002.

Effect of Long-term Ozone Exposure

Long-term exposure to elevated levels of ground-level ozone significantly raises the risk of dying from lung disease, according to a US study, the first to separate ozone's effects from those of fine particulate matter.

Source: Jerrett et al., Long-Term Ozone Exposure and Mortality; *New England Journal of Medicine* Volume 360:No. 11, 1085-1095, (2009), http://content.nejm.org/cgi/content/abstract/360/11/1085.

Air Quality & Ambient Measurements

Air Pollution from Ocean-going Ships

A study by the US National Oceanic and Atmospheric Administration finds that globally, the 51 000 commercial vessels now in use produce almost half as much particulate air pollution as the total number of automobiles on the planet. The problem is most severe in the Mediterranean, India and East Asia.

Source: Lack et al., Particulate emissions from commercial shipping: Chemical, physical, and optical properties, *J. Geophys. Res.*, 114, D00F04 (2009), doi:10.1029/2008JD011300.

Diesel-related Pollutants near Port Highways

Concentrations of black carbon, NOx, ultrafine particles, and particle-bound polycyclic aromatic hydrocarbons were found to be frequently elevated within 150 m of freeways and arterial roads with high localised impacts due to heavy-duty diesel trucks.

Source: Kozawa, Fruin and Winer, Near-Road Air Pollution Impacts of Goods Movement in Communities Adjacent to the Ports of Los Angeles and Long Beach; *Atmospheric Environment,* doi: 10.1016/j.atmosenv.2009.02.042.

$PM_{2.5}$ and Black Carbon outside US Schools

An air quality study was performed outside a cluster of schools, measuring $PM_{2.5}$ and black carbon concentrations at times chosen to capture vehicle emissions at the end of the school day.

Source: Richmond-Bryant, Saganich, Bukiewicz and Kalin, Associations of $PM_{2.5}$ and black carbon concentrations with traffic, idling, background pollution, and meteorology during school dismissals; *Science of the Total Environment*, 407 (10), p.3357-3364, May 2009, doi: 10.1016/j.scitotenv.2009.01.046.

Ionic Composition of $PM_{2.5}$ in Belgium

Major ionic components of $PM_{2.5}$, and gaseous pollutants were monitored over six locations (industrial, urban, suburban, and rural) in Belgium. The researchers concluded that vehicular emissions, coal/wood burning and animal farming are the dominant sources for the ionic components of $PM_{2.5}$.

Source: Bencs et al, Mass and ionic composition of atmospheric fine particles over Belgium and their relation with gaseous air pollutants; *Journal of Environmental Monitoring*, 2008; 10(10):1148-57), doi: 10.1039/b805157g.

Emissions Measurement

'Well-to-Wheel' study of Air Pollutant Emissions

'Well-to-wheel' emissions of NOx, PM_{10}, $PM_{2.5}$, CO and Volatile Organic Compounds (VOCs) for nine different vehicle/fuel systems show that vehicle/fuel systems differ significantly, not only in amounts but also by locations and sources.

Source: Hong Huo, Ye Wu and Michael Wang, Total versus urban: Well-to-wheels assessment of criteria pollutant emissions from various vehicle/fuel systems; *Atmospheric Environment* Volume 43, Issue 10 (March 2009), 1796-1804; doi: 10.1016/j.atmosenv.2008.12.025.

Characterisation of PM from Retrofit Vehicles

Particulate matter was characterised for four heavy-duty diesel vehicles in six retrofitted configurations and a baseline vehicle without aftertreatment, operating under cruise, urban transient (UDDS) and idle driving modes. The results showed that the introduction of retrofits reduced PM mass emissions by over 90% in cruise and 95% in the UDDS.

Source: Biswas, Verma, Schauer and Sioutas, Chemical speciation of PM emissions from heavy-duty diesel vehicles equipped with diesel particulate filter (DPF) and selective catalytic reduction (SCR) retrofits; *Atmospheric Environment* Vol. 43, Issue 11, (April 2009), 1917-1925, doi: 10.1016/j.atmosenv.2008.12.040.

Models for the sorption of VOCs by Diesel Soot

Diesel soot and atmospheric aerosols were found to exhibit similar characteristics with respect to their sorption interactions although differences in relative magnitude allow the two to be easily distinguished.

Source: Sanka N. Atapattu and Colin F. Poole, Models for the sorption of volatile organic compounds by diesel soot and atmospheric aerosols; *J. Environ. Monit.,* 2009, 11, 815 - 822, doi:10.1039/b818063f.

Analytical Method for Carbonyls and Aromatics

A novel analytical method for simultaneously monitoring airborne carbonyls compounds and aromatic hydrocarbons is presented in this paper. Carbonyls were collected onto an adsorbent to form thermo-stable derivatives and aromatic HCs were collected onto Tenax TA packed in the same sampling tube, and analysed using the same method as the carbonyls. Samples were stable for at least ten days.

Source: Yeh-chung Chien and Ko-ghun Yin, Simultaneous determination of airborne carbonyls and aromatic hydrocarbons using mixed sorbent collection and thermal desorption-gas chromatography/mass spectrometric analysis; *Journal of Environmental Monitoring*, 2009, doi: 10.1039/b820164a.

Interaction of Emissions and Climate Change

Interaction of Climate Change and Air Quality

A new review examines the effects of climate change on the environmental distribution and toxicity of chemical pollutants. The authors say that generally, increases in temperature will enhance the toxicity of contaminants and increase concentrations of tropospheric ozone.

Source: Noyes et al, The toxicology of climate change: Environmental contaminants in a warming world; *Environment International*, doi:10.1016/j.envint.2009.02.006.

A second report, from the US Environmental Protection Agency, examines the potential impacts of climate change on regional US air quality.

Source: Assessment of the Impacts of Global Change on Regional U.S. Air Quality: A Synthesis of Climate Change Impacts on Ground-Level Ozone, EPA/600/R-07/094F (April 2009) cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=203459.

Black Carbon and Arctic Warming

This paper shows that black carbon (BC) is responsible for 50% of the increased Arctic warming from 1890 to 2007. Arctic warming is more than twice the observed global average surface warming. The paper concludes that the Arctic responds strongly to BC emissions from the Northern Hemisphere. Because BC only remains in the atmosphere for several days to weeks, reducing it can bring about almost immediate mitigation of warming.

Source: Shindell and Faluvegi; Climate response to regional radiative forcing during the twentieth century; *Nature Geoscience* 2, 294 - 300 (2009), doi: 10.1038/ngeo473.

Radiative Forcing Effect of Road Transport

This paper attempts to quantify the total radiative forcing of CO_2, tropospheric ozone and fine aerosol particles resulting from road transport and power generation. The report says that on-road transport is a key target sector to mitigate global climate change because the net non-CO_2 radiative forcing is positive and considerably enhances the CO_2 impact. Assessment of the full impacts of technology and policy strategies designed to mitigate global climate change must consider the climate effects of ozone and fine aerosol particles, the authors say.

Source: Unger, Shindell and Wang, Climate forcing by the on-road transportation and power generation sectors; *Atmospheric Environment*, doi:10.1016/j.atmosenv.2009.03.021.

GENERAL

Task Force on reducing Arctic Soot

The eight-member Arctic Council has set up a Task Force to examine ways to reduce soot that is darkening ice around the North Pole and hastening a thaw resulting from global warming. The task force will recommend immediate actions and report on progress at a meeting in 2011. Soot darkens ice and allows it to soak up more heat, accelerating climate change. "New research shows that these common pollutants have contributed almost as much to temperature rises in the Arctic over the past century as carbon dioxide emissions," said the Norwegian Foreign Minister. Technology to clean up soot emissions was described as “cheap and easily available”.

Catalysts for Wood-Fired Home Heating

In recent research from Karlsruhe University, two different wood-fuelled fires for private homes were fitted with novel in situ gas sensors for residual oxygen and CO/HC flue gas analysis and with a catalytic converter for exhaust gas treatment.

A new control strategy based on the two gas sensor signals and on the combustion temperature enabled a reduction of CO/HC emissions to about 50% for a central heater and 15% for a stove. A catalytic converter was then fitted into the central heater’s flue gas channel and into the post-combustion chamber of the stove and the control algorithm parameters were adjusted. CO/HC emissions were further reduced to about 25% and <1%, respectively. The researchers also concluded that studies of the long-term stability of the catalyst material indicated that conversion kinetics are stabilised at an onset-temperature of about 155°C.

Source: Butschbach et al, Extensive reduction of toxic gas emissions of firewood-fuelled low power fireplaces by improved in situ gas sensorics and catalytic treatment of exhaust gas; *Sensors and Actuators B - Chemical,* 2009, 137(1):32-41, doi: 10.1016/j.snb.2008.12.007

IMO Report of Fuel Sulfur

The International Maritime Organisation (IMO) has reported the results of 2008’s worldwide fuel sulfur monitoring exercise to its Marine Environment protection Committee (MEPC).

The report shows that the average sulfur content of the tested residual fuel oil decreased from 2.42% in 2007 to 2.37% in 2008. Just 23 out of the 106 925 samples (0.02%) exceed 4.5% sulfur and none of the data providers report samples containing more than 5% S. 24.1% of the samples were below 1.5% S content. The distribution also shows that the figure for sulfur content between 1.5-2.0% is less than the figure for sulfur content between 1.0-1.5%.

Euro V takes to the Water

The first “Amphicoach” was launched in Malta at the end of March 2009. The vehicle, which carries 50 passengers, is driven by a Euro V Iveco diesel engine with all-wheel drive and operates in the water using water jet propulsion. It is also capable of serial hybrid electric propulsion if the bus is used in environmentally-sensitive areas.

FORTHCOMING CONFERENCES

Truck & Bus World Forum

11-12 May 2009, Lyon, France

Details at www.truckandbusworldforum.com.

Transport stakeholders will focus more than ever on forward-looking strategies to implement short and midterm action plans to insure profitable business models and efficient transport systems responding to customer demands, social constraints and environmental stakes.

Diesel Engine Technology Seminar

11-12 May 2009, Lyon, France

Details at www.sae.org.

This course will explain the fundamental technology of diesel engines and continue with aspects of engine design and emissions control design. An overview of developing technologies for the future with a comprehensive section on exhaust aftertreatment.

Diesel Emissions Conference & AdBlue Forum Asia

11-13 May 2009, Beijing, China

Details at www.integer-research.com/decasia.

Euro V is planned to take effect in China from 2012. In South Korea, Euro IV emissions standards have been

in place since 2006 and Euro V is being implemented this year. Across Asia, tighter emissions limits and harmonisation of emissions regulation have been under discussion between governments. DEC Asia brings together key emissions stakeholders to identify and take advantage of opportunities in Asia.

SAE Truck & Off-Road Global Summit

13-14 May 2009, Lyon, France

Proposed papers concentrate on electronics but cover emissions monitoring, OBD requirements and concepts for aftertreatment systems, diagnostics on retrofit, fuel consumptions tests, and heat recovery.

AEGPL 2009 Congress

13-15 May 2009, Vienna, Austria

Details at www.aegpl-expo.com.

This event includes LPG for vehicles and allows participants to exchange new ideas, examine technical innovations and grasp the opportunities presented on the market.

EVS 24 Battery, Hybrid & Fuel Cell Electric Vehicle Symposium and Exhibition

13-16 May 2009, Stavanger, Norway

Details at www.evs24.org.

Implementing Europe's Transport & Energy Policy

18-19 May 2009, Brussels, Belgium

Details at www.hartenergyconferences.com.

Diesel Particulates & NOx Emissions Short Course

18-22 May 2009, Leeds, UK

Details at www.engineering.leeds.ac.uk/cpd/AutoDieselParticulatesUK.shtml.

This course concentrates on the engine technology for low emissions, fuel requirements and aftertreatment techniques. It does not cover the details of the particulate measurement and analysis techniques, which are fully covered in a later companion course. However, it does cover particle size analysis and problems with the US heavy-duty transient test with very low emissions diesel engines.

17th Transport & Air Pollution Symposium and 3rd Environment and Transport Symposium

2-4 June 2009, Toulouse, France

Details at http://ettap09.inrets.fr.

The scope of these symposia covers on-road and non-road exhaust and non-exhaust emissions, ultrafine particles and greenhouse gas emissions. Dynamometer studies and field measurements, source apportionment, air quality modelling, human exposure to vehicle emissions and control and reduction technologies are all included.

(Particle) Emissions of 2-stroke Scooters – science, problems, solutions & perspectives

11-12 June, 2009, Monza/Milan, Italy

Details at www.sae.org/events/training/symposia/scooters.

The main topics will be research and reduction of emissions, development of aftertreatment devices for gaseous emissions and for (nano)particulates, lube oils & fuels, CO_2 emissions and fuel consumption, toxicity & health effects, alternative powertrains, and legislation & inventories.

SAE 2009 Powertrain, Fuels and Lubricants Meeting

15-17 June 2009, Florence, Italy

Details at www.sae.org.

Engine EXPO 2009 Open Technology Forum

16-18 June 2009, Stuttgart, Germany

Details at www.engine-expo.com.

Topics to be covered include the future of the internal combustion engine, evolution of affordable hybrid technologies, biodiesel technology, engine & transmission developments, and the impact of solid SCR systems.

8th Dresden Engine Colloquium

17-18 June 2009, Dresden, Germany

Details at www.fif.mw.htw-dresden.de/8DMK.html.

The theme is "the diesel engine - conflicting demands regarding climatic change and pollutant emission". The contents covers heavy-duty, light-duty and NRMM applications.

Grundlagenwissen Verbrennungsmotoren

17-18 June 2009, München, Germany

Details at www.vdi-wissensforum.de.

13th ETH Conference on Combustion-Generated Nanoparticles

22-24 June 2009, Zurich, Switzerland

The conference will provide an interdisciplinary forum for experts in various fields for the discussion of new scientific findings on combustion-generated nanoparticles, characterisation methods for automobile type-approval and in-use compliance testing and emissions control as well as health effects due to combustion-generated nanoparticles.

PTNSS International Congress on Combustion Engines

22-24 June 2009, Opole, Poland

Details at www.ptnss.pl/kongres.

The Congress covers a wide range of research topics in design, manufacture, research and ecological effect of internal combustion engines and fuel use.

Engine Emissions Measurement Short Course

22-26 June 2009, Leeds UK

Details at:

www.engineering.leeds.ac.uk/cpd/AutoEngineEmissions.shtml.

The course covers both existing instrumentation and new developments in emissions measurement techniques and instruments, and will be of interest to those who wish to learn about the latest developments in emissions measurement.

Diesel Emissions Conference and AdBlue Forum 2009

23-25 June 2009, Brussels, Belgium

With the new Euro VI legislation set to take effect in Europe from 1st Jan 2013, the question is no longer 'which technology' but 'which combination of technologies' to use for emissions reduction.

Emission Reduction Systems for Off-highway Applications

24-25 June 2009, Constance, Germany

Details at www.car-training-institute.com/off-highway.

Topics include DPF regeneration and SCR optimisation for non-road applications, and future emissions legislation for off-road diesel engines.

12th EAEC European Automotive Congress

29 June - 1 July 2009, Bratislava, Slovakia

Details at www.eaec2009.com.

Five parallel sessions allow over 100 presentations and discussions on topics of "Powertrain Efficiency", "Vehicle for the next Decade" and "Production and Transportation Systems".

Stickoxid Reduzierung / NOx Control

1-2 July 2009, Nürnberg, Germany

Details at www.vdi.de/nox.

Topics on the programme (German only) include the current state of legislation in Europe, USA and Asia, NOx reduction for diesel and gasoline engines in on- and off-road use, possibilities of internal engine NOx reduction, and the current status of NOx storage catalysts and SCR systems.

Grundlagen der Abgasnachbehandlung im Verbrennungsmotor

8-9 July 2009, Stuttgart, Germany

Details at www.vdi-wissensforum.de.

42nd IUPAC Congress: Chemistry Solutions

2-7 August 2009, Glasgow, Scotland

Details at www.rsc.org/ConferencesAndEvents/RSCConferences/IUPAC2009/index.asp.

Symposia topics include catalysis for a sustainable future, biofuels, chemistry addressing climate change, and chemistry and the hydrogen economy.

Directions in Engine-Efficiency and Emissions Research (DEER)

3-6 August 2009, Dearborn, Michigan, USA

Details at www1.eere.energy.gov/vehiclesandfuels/resources/conferences/deer.

At DEER 2009, the US Dept. of Energy will showcase its co-operatively funded R&D with its partners, and other national and international organisations. DEER fosters the exchange of information and best practices through presentations and posters from new and on-going engine R&D and networking.

Grundlagenwissen Verbrennungsmotoren

26-27 August 2009, Frankfurt am Main, Germany

Details at www.vdi-wissensforum.de.

World Hydrogen Technologies Convention 2009

26-28 August 2009, New Delhi, India

Details at www.whtc2009.org.

A biennial congress of the International Association for Hydrogen Energy, WHTC-2009 is being hosted by IndianOil and SIAM (Society of Indian Automobile Manufacturers), in association with the Indian Institute of Technology, Delhi and Banaras Hindu University.

AVL Congress Engine and Environment

10-11 September 2009, Graz, Austria

Details at www.avl.com/conferences.

Issues addressed will include powertrain electrification, combustion engines as main propulsion or emergency power supply, and new concepts for combustion engines as range extenders.

9th International Conference on Engines and Vehicles (ICE2009)

13-18 September 2009, Capri, Naples, Italy

Details at www.sae-na.it/iceconf.html.

Conference topics include fuel injection and combustion processes, alternative fuel power systems, powertrain technology, and exhaust aftertreatment and emissions.

MODEGAT – International Symposium on Modelling of Exhaust-Gas Aftertreatment

14-15 September 2009, Bad Herrenalb/Karlsruhe, Germany

Details at modegat.itcp.uni-karlsruhe.de.

Deadline for abstracts is 30 June 2009

This is the first symposium in Europe that specifically focuses on modelling and numerical simulation in automobile exhaust-gas aftertreatment.

SAE Heavy-duty Diesel Emissions Control Symposium

15-17 September 2009, Gothenburg, Sweden

Details at www.sae.org/events/training/symposia/hddec.

18th Aachen Colloquium 'Automobile and Engine Technology'

5-7 October 2009, Aachen, Germany

Details at www.aachener-kolloquium.de.

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 2009 Commercial Vehicle Engineering Congress and Exhibition

6-8 October 2009, Rosemont, Illinois, USA

Details at www.sae.org/events/cve.

AVL Roadshow: Abgasmesstechnik

7 October 2009, Fürth, Germany
14 October 2009, Hannover, Germany

Details at www.avl-abgasmesstechnik.de.

Busworld 2009

16-21 October 2009, Kortrijk, Belgium

Details at www.busworld.org.

Automotive Near Zero Emission Vehicle Technologies 2009 Conference

22 October 2009, Novi, Michigan, USA

Deadline for abstracts is 29 June 2009

Details at www.itbgroup.com/conferences_NZEV.htm.

This event will provide a forum for understanding developments to meet future exhaust emissions regulations and CO_2/fuel economy requirements. It will focus on alternative powertrain technologies such as hybrids and electric vehicles together with developments in exhaust aftertreatment systems.

APAC 15 – Asia-Pacific Automotive Engineering Conference

26-28 October 2009, Hanoi, Vietnam

Details at www.vsae.org.vn.

15th Small Engine Technology Conference

3-5 November 2009, Penang, Malaysia

Details at www.setc2009.com.

The conference will have presentations relating to small power sources and applications such as motorcycles, scooters, marine, agricultural and garden equipment, ATVs and portable generators.

7th FAD Conference: The challenge – exhaust aftertreatment for diesel engines

4-5 November 2009, Dresden, Germany

Details at www.fad-diesel.de.

Ricardo: Use of Biofuels by OEMs

5 November 2009, Shoreham-by-Sea, UK

This seminar will discuss the different types of biofuel and the problems OEMs are experiencing with the use of this fuel.

Reduction of Vehicles Particulates Emission – Experiences and Challenges

18-19 November 2009, Cracow, Poland

Details at www.inig.pl/DEXFIL/index.asp?P=1&L=E.

Planned thematic sessions cover the role of alternative fuels in PM reduction; exhaust aftertreatment systems - technical solutions and future requirements; PM filtration systems for biofuels and alternative fuels application; the development of DPF regeneration methods; and field experiences.

Grundlagen der Abgasnachbehandlung im Verbrennungsmotor

1-2 December 2009, Köln, Germany

Details at www.vdi-wissensforum.de.

The Spark Ignition Engine of the Future

2-3 December 2009, Strasbourg, France

Details at www.sia.fr/files/evenement/onglet/2260/callforpaperSPARKIGNITIONpdf.pdf.

This new SIA international Conference is intended to provide the opportunity for experts from OEMs and their suppliers, the oil industry, 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 combined low CO_2 and electrification challenges of the future.

6th International Exhaust Gas and Particulate Emissions Forum

9-10 March 2010, Ludwigsburg, Germany

33rd FISITA World Automotive Congress

30 May-4 June 2010, Budapest, Hungary

Details at www.fisita2010.com.

Deadline for abstracts is 30 June 2009

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.