



Newsletter

September - October 2008

INTERNATIONAL REGULATORY DEVELOPMENTS

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EUROPE

Health and Environmental NGOs say tighter CO₂ Targets help NO_x and PM

Europe could significantly cut its pollution-related health bill if it adopts a stricter 30% carbon emission reduction target for 2020, a group of health and environmental NGOs said in a study published on 2 October 2008.

The EU says it will tighten its current 20% target if other industrialised countries commit to similar goals, but the group says it should adopt a stricter target anyway because reducing carbon emissions by 30% would generate additional savings of up to €25bn annually in health costs. The savings would come from further reductions in emissions of PM, NO_x and SO₂. Tougher CO₂ reductions would also further reduce the cost of complying with air pollution legislation, the group says.

The report is at http://assets.panda.org/downloads/co_benefits_to_health_report_september_2008.pdf.

EU Ministers agree Plan to link Truck Tolls to Pollution

The European Union's 27 Transport Ministers have agreed in principle to a European Commission proposal to allow Member States to assess environmental charges and other fees on road-freight traffic. The 'Eurovignette Directive' is to give countries the option of imposing the charges, at least initially.

Under the Commission's proposed revision of the Directive, Member States would be able to include the cost of pollution and other "external factors," including noise pollution, and congestion caused by heavy goods vehicles. The Commission proposed a system to charge vehicles that weigh 12 tonnes or more beginning in 2011 and vehicles exceeding 3.5 tonnes starting in 2012. Revenues raised by the environmental levies must be used for research and development of 'clean' transportation or for cleaning up road transport-related pollution.

European Parliament's Environment Committee vote on Car CO₂

The European Parliament's Environment Committee has voted in favour of supporting the Commission's proposal that average CO₂ emissions from new cars should not exceed 130g/km by 2012. MEPs also demanded a longer term target of 95g/km by 2020, subject to review in 2014. The Environment Committee is the lead committee on this dossier.

The European Parliament's Industry Committee had recommended that the deadline for compliance be

extended to 2015. This approach had been strongly backed by vehicle manufacturers and it is understood that the German and French governments also supported it. Despite a compromise proposal by the rapporteur, the Industry Committee's recommendation was rejected by the Environment Committee. The Environment Committee also agreed with Commission proposals on imposing penalties on vehicle manufacturers that exceed the limits. Penalties would amount to €95 per gram exceeding the limit, multiplied by the number of vehicles sold. Calls had been made to lower the penalty to €50.

"CARS 21" Mid-term Review

The European Commission has published a report on the outcome of the mid-term review of its CARS 21 (Competitive Automotive Regulatory System for the 21st Century) process.

A task force to promote "green" (primarily low-CO₂) cars will be set up to explore technical, regulatory and economic hurdles and suggest ways forward for such vehicles. In addition, revising the New European Drive Cycle in time for the next generation of CO₂ standards is proposed and developing a World Light-duty Test Procedure at the UNECE is supported by stakeholders. Stakeholders agreed that R&D efforts should concentrate on the most promising future technologies: hybrid and electrical vehicles as well as hydrogen (and fuel cell) vehicles. The report is at http://ec.europa.eu/enterprise/automotive/pagesbackground/competitiveness/cars21_mtr_report.pdf.

EEA Report on EU Greenhouse Gas Emissions

New projections of greenhouse gas emissions to 2010 confirm that the EU's fifteen oldest member states remain on track to meet their joint Kyoto protocol greenhouse gas reduction target despite a mixed picture of countries' individual performances. The report, released by the European Environment Agency (EEA), shows that greenhouse gas emissions have been decreasing in all main sectors (except transport) and are projected to further decrease, except in industrial processes. More than 90% of total EU domestic transport emissions are due to road transport. After a decrease in these emissions between 2004 and 2005, they increased very slightly (0.3%) in 2006. The average CO₂ emissions of new passenger cars fell by 14% between 1995 and 2006, but progress has slowed down and if current trends continue, the EU objective of 120g CO₂/km by 2010 will not be met, the report says.

EEA Report No 5/2008, *Greenhouse gas emission trends and projections in Europe 2008* is at http://reports.eea.europa.eu/eea_report_2008_5/en.

Swiss Federal Council approves new Ordinance on Air Quality

The Federal Council in Switzerland has approved amendments to the ordinance on air quality that set requirements to ensure that construction equipment is fitted with particulate filters (DPFs).

The new Ordinance does not specify that DPFs must be fitted, but sets a particle number limit of 10^{12} particles/kWh for machines and equipment from 18kW. Engines must also meet the requirements of the EU's NRMM Directive (97/68/EC) applicable to their year of manufacture. The amendments apply to all new machines of 37kW or more on construction sites from 1 January 2009 and new machines of 18 to 37kW from 1 January 2010. Existing machines of 37kW or over built between 2000 and 2008 must meet the requirements from 1 May 2010. Older machines are exempt until 1 May 2015 and there are no retrofit requirements for engines below 37kW. The particle number requirements for existing machines are deemed to be met by fitting a particulate filter system included on the Swiss OFEV/Suva list. These must:

- retain 97% of 20 to 300nm particles when new and after 1000 hours continuous use;
- retain 90% of solid particles during regeneration;
- operate without additives containing copper or catalytic coatings based on copper;
- limit secondary emissions to the extent allowed by the state of the art and operating conditions;
- be fitted with electronic pressure monitoring;
- not exceed 0.15m^{-1} opacity coefficient;
- be manufactured so that it is impossible to install it in the opposite direction to the direction of flow;
- be provided with instructions for cleaning and maintenance.

Netherlands increases Budget for Cleaner Vehicle Incentives

The Netherlands has increased budgets for two schemes to incentivise cleaner vehicles.

For commercial vehicles, the budget for the scheme to incentivise the purchase of Euro V and EEV trucks is increased by €7 million to €44 million. VROM, the Dutch Environment Ministry, says that in the past year the purchase of trucks and buses that meet these requirements greatly increased, partly as a result of the subsidies. The subsidy has been extended since it is important for the improvement of air quality that this trend continues. Truck and bus owners with a Euro III engine with a capacity below 225kW can still get grants for the installation of a particulate filter so that their vehicle meets the requirements of the environmental zones.

VROM also says that the number of new taxis and vans fitted with original-equipment particulate filters is constantly increasing. In order to continue to encourage purchase of new vehicles with particulate filters, the budget of the system has been increased by €3 million to €16 million.

Czech Environment Agency reports rising Transport Pollution

The Czech Republic's environment agency has identified air pollution from road and air transport as a major growing problem in its latest annual report on the state of the national environment. The agency, Cenia, says particulate emissions from road vehicles have increased consistently since 1993 and reached their highest ever level in 2007, the most recent year for which figures are available.

Austrian Touring Club calls for Earlier Introduction of Euro 6

ÖAMTC - The Austrian Automobile, Motorcycle and Touring Club has issued a list of 26 demands on taxation, environment, safety and social issues for the new Austrian Government.

The club says that the Federal Government should use its influence to argue in the EU's advisory bodies that the Euro 6 emissions limits should be binding from 2012. It also supports the EU's push for a reduction in CO₂ emissions from cars from 2012 but comments that the OEMs' penalties for failing to meet CO₂ targets should not be passed on to purchasers of higher consumption but 'life-essential' vehicles such as 'family vans'. The organisation also argues that environmental protection laws should be 'demand and cause oriented' and that the Federal ambient noise and air pollution protection act (IG-L) should be revised. They call for the cancellation of car-dependent kilometre road pricing and city tolls, for no new taxes "under the pretext of environmental control" or "eco-cladding", and for a guaranteed tax promotion of alternative fuels until at least 2018.

UK Automobile Club calls for Scrappage Incentives

A scheme to encourage the scrapping of old cars to increase the rate at which motorists trade them for newer, more fuel-efficient models, could achieve environmental benefits according to new research by the UK's Royal Automobile Club (RAC) Foundation.

The report, *Car Ownership in Great Britain*, concluded that financial encouragement for car owners to scrap older vehicles could encourage fleet renewal, but intervention must be done carefully if the vehicle market is not to be distorted. The research showed

that in the UK, the ideal age to incentivise car scrappage so as to reduce emissions would be for 17-18 year-old cars. Such a scheme would remove most of the last cars that were not equipped with catalytic converters.

Compromise on German 'MAUT' Truck Tolls agreed

German Ministers of Transport meeting in Dessau have agreed a compromise on the changes to the MAUT road-charging tax for trucks.

The toll to be paid by Euro III trucks from the beginning of 2009 will rise by 2 cents/km less than previously planned. This will be a temporary measure, lasting until the end of 2010. To balance this, the rate for other classes will be 0.1 cents/km more than previously planned. Saxony-Anhalt's Transport Minister Dr. Karl-Heinz Daehre said that the truck operators now know that in two years, at the latest, they must have Euro V trucks. The Ministers made it clear that they favour the toll as a method of encouraging low emissions trucks.

Reports on Irish Air Quality

The Irish Environmental Protection Agency's report on 'Air Quality in Ireland 2007' shows that all monitoring stations throughout the State met EU standards. The Irish EPA said that the results show that there is a strong link between air quality and local emissions. Levels of PM10 were relatively high in smaller towns due to traffic and continued use of bituminous coal. NO₂ levels were highest in the most urbanised areas, mainly due to traffic density. Pollution from NO₂ and fine dust particles could rise in Ireland's urban areas with further increases in traffic, the report says. The findings are repeated in a second report, 'Ireland's Environment 2008' which analyses the last four years of Ireland's environmental performance, the pressures on it and the way society is responding to current and emerging environmental issues.

Denmark delays Air Quality Targets

Denmark has decided to ask the EU for more time to meet the EU's new limits on particles, due to come into effect in 2010. The Danish Environment Ministry is asking for the requirements to be delayed until 2015. This is permitted under the EU legislation but States have to demonstrate that actions are being taken to resolve the problem. It is the first time that Denmark has had to ask for a respite in meeting the EU's environmental requirements.

Sweden ends Subsidy for Low-CO₂ Cars

The Swedish Environment Minister has announced that a subsidy scheme to encourage private motorists to buy low-carbon cars will be phased out next June, six months earlier than planned. In a statement the Minister said the subsidy had achieved its purpose, and that funds would be better allocated to other environmental projects. The scheme has proven so popular that the government has already had to treble the original SKr250m (€27m) funding to SKr815m.

BMW and Volkswagen announce Cars meeting Euro 6 Emissions Limits

Volkswagen has announced that the first of a range of models which it says meet the Euro 6 emissions standard will be available at the beginning of 2009. The VW Passat Blue TDI will use Selective Catalytic Reduction (SCR) with AdBlue[®] urea for control of NOx emissions. VW says other Blue TDI models will follow.

Among BMW's introductions at the 2008 Mondial de l'Automobile in Paris is a new 'BluePerformance' application that will bring diesel emissions to Euro 6 compliance. The new BMW 330d will have an option of a 'BluePerformance' package with a NOx storage catalyst. In this configuration the company says it will meet all the requirements for Euro 6 emissions. In addition the 3.0-litre 6-cylinder 'AdvancedDiesel' featured in both the BMW X5 and 335d will be available in the US with an SCR system for NOx control. BMW's AdvancedDiesel with BMW BluePerformance will sell as a 50-state model.

French Electricity Company orders 54 V-18 Diesel engines with SCR

MAN Diesel has been awarded a major order from the French energy company Electricité de France PEI SAS for the construction of three diesel power stations in its overseas Départements Réunion, Guadeloupe and Martinique, as well as one in French Guyana and two power plants on Corsica.

MAN Diesel will deliver 54 large, 18V48/60 diesel engines with a total power output of 1,025 MW. All of the power stations are designed as baseload power plants, which means that they are the primary source of electrical energy to the local power grid. The 18-cylinder V engines will be assembled in MAN Diesel's French production facility at Saint-Nazaire. All of the engines will be fitted with a urea-SCR (Selective Catalytic Reduction) system for control of NOx emissions. The six turnkey diesel power plants will go on grid between 2010 and 2012.

Bombardier launches SCR Train System

At InnoTrans 2008, the world's largest rail industry fair, Bombardier Transportation launched its ECO4 modular portfolio of 'eco-technologies' and products including NRMM Stage IIIB emissions equipment. All ECO4 products are, says Bombardier, fully operable and can easily be customised to any fleet.

The C.L.E.A.N. Diesel Power Pack, provides a drive system for Diesel Multiple Units in the 660kW class in conformity today with the stage III-B emissions requirements to be implemented in 2012. Bombardier says that the system leads to a reduction in particulate emissions of 87% and is ready to be implemented for a full-production run. The system uses SCR technology (Selective Catalyst Reduction). In 2009, the C.L.E.A.N. Diesel Power Pack will become part of the train sets for the Rhein-Main-Verkehrsverbund (RMV) in Germany and for Vasttrafik in Sweden."

NORTH AMERICA

EPA tightens Emissions Standards for Lawnmowers and Watercraft

The US Environmental Protection Agency (EPA) has announced the final new standards for small gasoline-powered small engines such as lawn and garden equipment and for gasoline-powered boats and personal watercraft.

The Final Rule for **small engines** published on 4 September 2008 covers spark ignition (SI) engines rated below 19kW used in household and commercial applications. It includes not only lawn and garden equipment, but also generators and a variety of construction, farm and industrial equipment. EPA says it will reduce HC+NOx emissions by about 35% and is consistent with California requirements.

HC+NOx exhaust emissions standards will be 10g/kWh for Class I engines starting in the 2012 model year and 8g/kWh for Class II engines starting in the 2011 model year. EPA expects manufacturers to meet these standards by improving fuel systems, engine combustion and in some cases adding catalysts. The exhaust emissions standards for small handheld equipment are unchanged but there are new evaporative emissions standards for all equipment.

For small SI engines used in **marine generators**, EPA is adopting a more stringent Phase 3 CO emission standard of 5g/kWh for all sizes of engine.

The new requirements for **outboard and personal watercraft engines** start with the 2010 model year. The HC+NOx standard for engines producing ≤ 4.3 kW maximum power is 30g/kWh. For engines producing over 4.3kW the standard gradually increases based

on the engine's maximum power. The CO standard for engines producing ≤ 40 kW gradually increases based on the engine's maximum power, whilst that for engines with maximum power greater than 40kW is 300g/kWh. EPA says they expect manufacturers to meet these standards with improved fuelling systems and other in-cylinder controls.

The new standards for **sterndrive and inboard marine engines** are 5g/kWh for HC+NOx and 75g/kWh for CO starting with the 2010 model year. These standards are expected to be met by using three-way catalysts and closed-loop fuel injection. On-board diagnostics will also be required. For sterndrive and inboard marine engines above 373kW with high-performance characteristics ("SD/I high-performance engines"), EPA is adopting a CO standard of 350g/kWh. The HC+NOx standard will be 20g/kWh for high-performance engines producing between 373 and 485kW in 2010 followed by a tightened standard of 16g/kWh in 2011. For high-performance engines producing over 485kW, the HC+NOx standard will be 25g/kWh in 2010 and 22g/kWh in 2011. EPA is also adopting "not-to-exceed" standards for normal speed-load combinations that are not included in the certification duty cycle.

In addition to the exhaust emissions standards there are new evaporative emissions standards for all vessels using marine spark-ignition engines.

California proposes changes to Regulations for Off-Road SI Engines

The California Air Resources Board (CARB) has proposed amendments to the State's Regulation for emissions from small (<50cc) off-road engines (SORE) and large off-road Spark Ignition engines (LSI) of less than 1 litre displacement. The latter class of engines are typically used for portable generators, lawn care equipment and other industrial equipment.

In 2003 CARB adopted 'tier 3' limits for HC+NOx emissions of **small off-road engines (SORE)** engines <50cc, which were expected to require the use of catalysts when they came into force in 2005. However, the regulations included an emissions credit system, as a result of which manufacturers have banked over 10 000 tons worth of HC+NOx credits by the end of the 2007 model year and are building very few engines that meet the tier 3 standards. The expected air quality benefits are thus not being realised. CARB now proposes eliminating new emissions credits after model year 2009; modifying the use of existing credits; and limiting the lifetime of future certification emissions credits to five model years. The proposal also includes an option to accept the use of a certification fuel with up to 10% ethanol.

Regulations for **large SI engines** of >19kW (LSI engines) were first proposed in 1998. The requirements for engines of over 1 litre started with the 2001 model year, but it was agreed that the smaller engines of ≤1 litre would align with the small off-road engine (SORE) requirements. However, when the latter were tightened in 2003, the requirements for LSI engines of ≤1 litre remained unchanged. CARB is therefore proposing a new set of standards for 2011 and subsequent model years. The proposals are shown in the table below.

Model Year	Engine Displacement	Durability Period	HC+NO _x (g/kW-hr)	CO (g/kW-hr)
2002 – 2010 (current requirement)	≤ 1.0 L	1,000 hours or 2 years	12.0	549
2011 and subsequent	≤ 825 cc	1,000 hours or 2 years	8.0	549
2011 - 2014	> 825 cc - ≤ 1.0 L	1,000 hours or 2 years	6.5	375
2015 and subsequent	> 825 cc - ≤ 1.0 L	1,000 hours or 2 years	0.8	20.6

CARB also proposes that from 2011 these engines should meet evaporative emissions limits.

In addition, CARB staff proposes that LSI engines used in vehicles which are “substantially similar to off-highway recreational vehicles” would be required to meet the proposed LSI engine emissions standards but would demonstrate compliance using the off-highway recreational vehicle test procedures. Specifically, LSI engines used in vehicles that meet the “Off-Road Sport Vehicle” or “Off-Road Utility Vehicle” definitions (except for payload capacity) would be subject to the proposed LSI standards for engines ≤1 litre, beginning in 2011.

California publishes Draft Regulations for In-Use Heavy-Duty Trucks

The California Air Resources Board (CARB) has published its latest draft of a new regulation intended to reduce NO_x and PM emissions from the approximately one million in-use heavy-duty diesel trucks that operate in California, beginning in 2010.

The regulation affects heavy-duty diesel-fuelled vehicles with a gross vehicle weight rating greater than 14 000 pounds (6.35 tonnes); “yard trucks” (vehicles used to move trailers and containers around freight terminals, warehouses etc.) fitted with off-road certified engines; and diesel-fuelled shuttle buses of any weight carrying 10 or more passengers on an average of 10 trips per day to or from airport terminals, marine terminals, and rail based stations. “Drayage trucks” - heavy-duty diesel trucks that transport containers and bulk goods to and from ports and rail yards - and vehicles owned by utility companies would be subject to the regulation from 1

January 2021. The regulation would apply regardless of where the vehicle is registered.

If adopted at the Board’s hearing on 11 December 2008, the regulation will require truck owners to install diesel particulate filters starting in 2010, with nearly all vehicles upgraded by 2014. In general, the regulation would require owners to reduce PM and NO_x emissions from their fleet by upgrading the vehicles to meet BACT (Best Available Control Technology) standards for PM and NO_x. The BACT standard for PM is an engine equipped with the highest level verified emission control device for PM or an engine originally equipped with a diesel particulate filter by the engine manufacturer. The BACT standard for NO_x is an engine newly manufactured in 2010 or later or a 2010 emissions equivalent engine. A fleet may meet the requirements by retrofitting, replacing an engine, or replacing a vehicle with a cleaner one.

US plans to introduce Ship Emissions Control Areas round US Ports

Following the adoption by the International Maritime Organization (IMO) of new emissions standards for large diesel ships and their fuels (see International section), the US Environmental Protection Agency (EPA) says that it can now move forward with a domestic rulemaking action under the Clean Air Act. When fully implemented, this will, says EPA, help reduce harmful emissions by 80% or more from large diesel ships. EPA says that without further controls, pollution from ships will increase to 34% of NO_x, 45% of PM, and 94% of SO_x emissions by 2030.

New Study says Air Pollution takes Two Months off Mexicans' Lives

A new study from the Harvard Initiative for Global Health concludes that Mexico's average life expectancy would be longer by 2.4 months if urban air quality were improved. The study used death records and air quality monitoring data to estimate the number of people who died from lung cancer, cardiopulmonary diseases, respiratory infections and other illnesses as a result of breathing heavily polluted air. The authors found that between 2001-2005 some 7600 lives were cut short each year by diseases related to air pollution, representing about 1.6% of annual deaths in Mexico. The highest proportion of those deaths (38%) were in Mexico City, a valley long known for its dense layer of smog.

Source: Gretchen Stevens, Rodrigo Dias and Majid Ezzati, The effects of 3 environmental risks on mortality disparities across Mexican communities; *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* (October 2008) doi: [10.1073/pnas.0808927105](https://doi.org/10.1073/pnas.0808927105).

Senate Legislation introduced to Study Role of Black Carbon in Global Warming

Three US Senators (Hillary Rodham Clinton, Tom Carper and John Kerry) have introduced legislation that, if passed, would direct the US Environmental Protection Agency to study the role of soot in global warming and to identify technologies and strategies to reduce black carbon emissions. Senator Clinton said that "recent scientific evidence indicates that soot emissions may have a powerful warming effect, particularly in the near term. The good news is that we have technology to reduce these emissions, such as retrofitting old school buses and trucks with pollution control equipment."

EPA considers Short-Term NO₂ Standard

The US Environmental Protection Agency's latest risk assessment of nitrogen dioxide suggests that short-term NO₂ exposure is harmful to human health and as a result the agency is considering setting a new standard. Currently EPA sets a 53ppb annual average National Ambient Air Quality Standard (NAAQS) for NO₂ but there is no 1-hour or 24-hour standard.

California introduces Database for Verified Emissions Control Systems

The California Air Resources Board (CARB) has released a searchable database for verified diesel emissions control systems. It can be searched by device name, engine family name, or a less specific search by engine model year, engine manufacturer, and displacement. The database currently covers California-certified 1992 and newer on-road engines, and 1996 and newer off-road engines. Additional model years will continue to be added and the database will be updated regularly. It is at <http://arb.ca.gov/diesel/verdev/vdb/disclaimer.php>.

Voluntary Agreement on PM Emissions of Wood-burning Heaters

Seven key manufacturers of outdoor wood-fired heaters that provide heat and hot water for homes and other buildings have pledged to make units that will emit 90% less PM_{2.5} air pollution, under the second phase of a voluntary partnership with the US Environmental Protection Agency (EPA). Under the agreement, the manufacturers have pledged to make at least one unit emitting no more than 0.32 pounds of particle pollution per million Btu of heat output (approximately 0.5g/kWh). The models must be tested by an EPA-accredited laboratory to verify these emission levels. This phase also covers models that burn other biomass such as corn or wood pellets.

US EPA 2008 Report on the Environment

The US Environmental Protection Agency (EPA) has released the "2008 Report on the Environment: Highlights of National Trends". The report is intended for a general audience to provide a resource for better understanding of the trends in the country's health and environment. It summarises highlights of the more comprehensive "EPA's 2008 Report on the Environment," which was released in May, and provided the scientific and technical information. EPA says the two reports together present national environmental trends and inform EPA's strategic planning process with the best available, scientifically sound information.

Draft US EPA Strategic Plan

The US Environmental protection Agency (EPA) has released the draft for public comment of its Strategic Plan Change Document for the period 2009-2014.

On air quality, the document says that EPA will develop programmes for mobile and stationary sources that achieve large, nationwide, cost-effective reductions in emissions for PM and its contributors, NO_x, and volatile organic compounds. EPA will implement a series of national programmes to reduce emissions from a wide range of mobile sources, including the Tier 2 Vehicle and Gasoline Sulfur Program, Clean Diesel Truck and Bus Programme, and the Clean Air Non-road Diesel Rule.

EPA will work with partners to improve air quality for ozone and PM_{2.5} and will continue to focus on implementing the fine particulate matter standards and 8-hour ozone standards. The plan is available at: www.epa.gov/octo/plan/plan.htm.

California Reports on Benefits of Greenhouse Gas Reduction Plans

The California Air Resources Board (CARB) has released two reports that show how the proposed strategy combining a market-based regulatory approach, voluntary measures, fees, and other policies to reduce greenhouse gas emissions will provide net benefits to both California's economy and to public health.

The economic analysis indicates that the majority of the economic benefits are the result of investments in energy efficiency that more than pay for themselves over time. The public health analysis says that implementing the recommendations to reduce greenhouse gas emissions will build on existing air pollution programmes that reduce ozone-forming pollutants and particulate matter, providing "significant additional public health and environmental benefits".

In 2020 an estimated 300 premature deaths will be avoided across the State and almost 9000 incidences of asthma and lower respiratory symptoms will be avoided as a result of the actions. The reports are at www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.htm.

Preliminary Report Released on Use of Intermediate Ethanol Blends

The US Department of Energy's National Renewable Energy Laboratory (NREL) and Oak Ridge National Laboratory have released a preliminary report on the use of higher ethanol-gasoline blends in on-road and small non-road engines. The test programme focuses on the effects of intermediate blends of E15 and E20 (15% and 20% ethanol respectively) on emissions, catalyst and engine durability, drivability, and materials compatibility. The study found that most of the regulated vehicle emissions from E15 and E20 use were within the normal test-to-test variation. However, engine performance for the small non-road engines was inconsistent, even with traditional gasoline; and the effect on durability of less expensive 'residential' engines was not clear, says the report, given that a number of these engines failed regardless of the fuel type.

SOUTH AMERICA

Peru issues New Air Quality Standards, and Biodiesel Requirement

The Peruvian government has published new air quality standards that set maximum permissible limits on emissions of several gases as well as particulate matter. Supreme Decree 003-2008-MINAM, published by the Environment Ministry, establishes limits on sulfur dioxide (SO₂), benzene, hydrogen sulphide (H₂S), total hydrocarbons (expressed as hexane), and particulate matter.

Of the different compounds listed in the decree, only sulfur dioxide emissions were previously subject to established quality standards. The new limits for SO₂ and H₂S come into force on 1 January 2009 with a further step for SO₂ from 1 January 2014. The limits for hexane (100µg/m³) and benzene (4µg/m³) come into effect from 1 January 2010 with a second step of 2µg/m³ for benzene by the start of 2014. The standard for particulate less than 2.5µm in size (PM_{2.5}) will be 50µg/m³ by 1 January 2010, falling to 25µg/m³.

Law 28054, passed in 2003, requires the use of biodiesel mixture in diesel, but the measure has been postponed repeatedly. The new target date is 1 January 2009, and it appears the government will follow through with the legislation, which initially requires diesel fuel to contain at least 2% biodiesel.

One year later, by 1 January 2010, diesel fuel will have to meet a 5% biodiesel target.

In the meantime, the country's Human Rights Ombudsman's office presented a new report on air quality in the capital, a follow-up to an initial study conducted 18 months ago. The new report, *Air Quality in Lima and its Impact on the Health and Lives of Residents*, says that 86% of the contamination in Lima is caused by public transportation and it called on both the central and city governments to take action.

Brazil to get 50ppm Sulfur Diesel in 2009 and 10ppm from 2012

Petrobrás has now agreed to supply 50ppm sulfur diesel fuel in 2009, after losing a São Paulo State Court battle over diesel desulfurisation deadlines. Six years ago, the National Environmental Council (Conama) issued a norm stating that as of January 2009 the sulfur level in diesel must be cut to 50ppm in major cities, down from the current 500ppm in urban regions and more than 2000ppm in rural areas. Following this, Brazil's Minister of Environment proposed at a meeting of the National Environment Council (Conama) that diesel fuel would have to meet a 10ppm sulfur limit by 2012 rather than by 2017. On 30 October 2008, Petrobras and the government agreed that the 10ppm sulfur fuel standard will take effect in major cities in 2012 and 2000ppm sulfur diesel will be phased out completely by 2014.

In parallel, vehicle standards have also been modified. Previously, Euro IV standards were intended to go into effect in 2009. Now these standards will be skipped and replaced with Euro V standards in 2012.

ASIA-PACIFIC

Pollution Risk is higher for the Poor in Hong Kong

Poor people in Hong Kong have a higher risk of death when air pollution is bad, a seven-year study by the University of Hong Kong's School of Public Health has found. According to the report's authors, people living in highly-deprived areas had higher risk of mortality after bad air pollution days. Most deaths occurred a day after the air pollution index showed a rise.

The researchers examined data on over 200000 deaths in Hong Kong between 1996 to 2002 from respiratory and cardiovascular causes. Data included details on the districts they lived in, their income, whether they were single or married and if they lived alone before they died. The data was compared against air pollution readings in the territory, taking into account four pollutants: nitrogen dioxide, sulfur dioxide, particulate matter less than 10µm in diameter

(PM₁₀) and ozone. The researchers found that more deaths occurred in poor neighbourhoods immediately after air pollution readings increased. Such a phenomenon was not observed in richer neighbourhoods.

Source: Chit-Ming Wong et al, The Effects of Air Pollution on Mortality in Socially Deprived Urban Areas in Hong Kong, China; *Environmental Health Perspectives*, Volume 116, Number 9, September 2008.

Singapore orders 400 EEV Buses

Singapore's public transport company SBS Transit Limited has ordered 400 buses meeting European EEV emissions standards as part of its fleet replacement programme. The Scania buses will use EGR and particulate filters for emissions control. Delivery will start in 2009.

Euro 5 Diesel Fuel in the Philippines

Seaoil Philippines Inc. has announced that it has entered into a supply contract with a South Korean trading house for the sale and distribution of Euro 5 (max. 10ppm sulfur) diesel fuel, making it the first oil firm in the Philippines to comply with this standard. At present, diesel being sold in the Philippines is only at Euro 2 standard.

Indonesia mandates use of Biofuels

In September the Indonesian Government issued a Ministerial Decree that makes the use of biofuel mandatory from 2009.

For biodiesel, the decree states the transport sector must use a blend of 1% palm-based biodiesel with mineral diesel, while industry must use a 2.5% blend and power plants a 0.25% blend, both palm oil-based. By 2010, the palm biodiesel content will be increased to between 2.5 and 3% percent for transportation, 5% for industry, and 1% for power plants.

For bioethanol, the use of a 1 to 5% blend of bioethanol with petrol for transportation will become mandatory in 2009. Industry will have to use a 5% blend of bioethanol (made from cane molasses and cassava) next year, increasing to 7% by 2010.

Australia seeks lower CO₂ Emissions from Cars

The Australian government has issued a discussion paper on reducing automobile carbon emissions, with recommendations such as providing financial incentives for manufacturing low-emission cars.

The vehicle fuel efficiency report released by the Transport and Environment Ministers recognised that there was no straightforward solution for reducing carbon emissions in the transport sector which

accounts for 14% of the nation's emissions. Car makers could be directed to include information about CO₂ emissions and fuel consumption in their advertising. The Federal government also urged an environmental rating scheme for heavy vehicles. The recommendations for reducing emissions in Australia follow the Federal government's promise to cut overall emissions by 60% by 2050. Australia produces about 1.5% of global emissions, but the country is the fourth largest per-capita emitter, with five times more carbon pollution per person than China.

RESEARCH

Air Quality, Emissions and Health

Air pollution and the heart's electrical functioning

PM_{2.5} and black carbon, indicators for traffic exhaust, can adversely affect the heart's ability to conduct electrical signals in people with serious coronary artery disease, according to a new study. The researchers observed changes (not associated with symptoms) that were predicted by an elevation in fine particles and black carbon, even at levels below the US's proposed National Air Quality Standards.

Source: Kai Jen Chuang et al, Particulate Air Pollution as a Risk Factor for ST-Segment Depression in Patients with Coronary Artery Disease. *Circulation*, Sep 2008;

doi: [10.1161/CIRCULATIONAHA.108.765669](https://doi.org/10.1161/CIRCULATIONAHA.108.765669).

Effect of black carbon on lung function

A new paper focuses on the relationship between black carbon (BC), as a surrogate of traffic-related particles, and lung function among women in Boston, Massachusetts. The authors say that BC was associated with a 1.1% decrease in forced expiratory volume in 1 sec, a 0.6% decrease in forced vital capacity, and a 3.0% decrease in forced mid-expiratory flow rate. They noted that former smokers were most affected by BC exposure, whereas current smokers were not affected. They conclude that, in this cohort, exposure to traffic-related BC, independently predicted decreased lung function in urban women, when adjusting for tobacco smoke, asthma diagnosis and socioeconomic status.

Source: Suglia et al, Association between Traffic-Related Black Carbon Exposure and Lung Function among Urban Women; *Environmental Health Perspectives* 116:1333-1337 (October 2008) doi:[10.1289/ehp.11223](https://doi.org/10.1289/ehp.11223).

Young, healthy people show no effect from ambient particle exposure

Although many studies have shown that particulate air pollution is associated with increased risk of cardiovascular events, a new study from researchers in Denmark and Sweden concludes that exposure to air pollution particles at outdoor concentrations for up to 24 hours is not associated with detectable systemic

inflammation, oxidation, or microvascular function in young healthy participants.

Source: Brauner et al, Exposure to ambient concentrations of particulate air pollution does not influence vascular function or inflammatory pathways in young healthy individuals *Particle and Fibre Toxicology* 2008, 5:13 [doi: 10.1186/1743-8977-5-13](https://doi.org/10.1186/1743-8977-5-13)

Review of health effects of NO₂

A new study from the University of Hamburg reports on a systematic review of studies on the health effects in humans caused by environmental NO₂. The authors conclude that there was limited evidence that short-term exposure to a 1-hour mean value below 200µg/m³ NO₂ is associated with adverse health effects. There was moderate evidence that short-term exposure below a 24-hour mean value of 50µg/m³ NO₂ at monitor stations increases hospital admissions and mortality. There was moderate evidence that long-term exposure to an annual mean below 40µg/m³ NO₂ was associated with adverse health effects.

Source: Latza, Gerdes and Baur, Effects of nitrogen dioxide on human health: Systematic review of experimental and epidemiological studies conducted between 2002 and 2006; *International Journal of Hygiene and Environmental Health*, [doi: 10.1016/j.ijheh.2008.06.003](https://doi.org/10.1016/j.ijheh.2008.06.003).

Long-term NO₂ exposure and heart rate variability

Researchers from Switzerland and the US conclude in a new paper that there is some evidence that long-term exposure to NO₂ is associated with cardiac autonomic dysfunction in elderly women and in subjects with cardiovascular disease.

Source: Dietrich et al, Differences in Heart Rate Variability Associated with Long-Term Exposure to NO₂; *Environmental Health Perspectives* 116:1357–1361 (October 2008) [doi:10.1289/ehp.11377](https://doi.org/10.1289/ehp.11377).

Traffic-related air pollution and asthma in children

In a study from American, British and Spanish institutes NO₂ monitors were placed outside the homes of 217 children from participants in the Southern California Children's Health Study and health records, including new asthma incidence (30 cases) were reported annually through questionnaires during 8 years of follow-up. The report concludes that markers of traffic-related air pollution were associated with the onset of asthma.

Source: Jerrett et al, Traffic-Related Air Pollution and Asthma Onset in Children: A Prospective Cohort Study with Individual Exposure Measurement *Environmental Health Perspectives* 116:1433–1438 (October 2008) [doi:10.1289/ehp.10968](https://doi.org/10.1289/ehp.10968).

NO₂ from gas stoves worsens children's asthma

Exposure to high levels of NO₂ emitted from gas stoves can exacerbate asthma symptoms in children, especially preschoolers, say researchers. During the study, the research team compared the frequency and intensity of coughing, wheezing, shortness of breath and chest tightness to NO₂ levels inside the inner-city

homes of 150 Baltimore City children of age 2 to 6 years. They found that NO₂ worsened day and night asthma symptoms in children. Each 20-point increase in NO₂ levels led to 10% more days of cough and 15% more days with limited speech due to wheezing.

Source: Hansel et al, A Longitudinal Study of Indoor Nitrogen Dioxide Levels and Respiratory Symptoms in Inner-City Children with Asthma; *Environmental Health Perspectives*, 116:1428–1432 (October 2008) [doi:10.1289/ehp.11349](https://doi.org/10.1289/ehp.11349).

Study on Lung Cancer in US Trucking Industry

An elevated risk of lung cancer in truck drivers has been attributed to diesel exhaust exposure. A new study from the USA assesses the association of lung cancer mortality and measures of vehicle exhaust exposure up to the year 2000. The results show that, after adjusting for age and a healthy-worker survivor effect, lung cancer hazard ratios were elevated in workers with jobs associated with regular exposure to vehicle exhaust. Mortality risk increased linearly with years of employment and was similar across job categories despite different current and historical patterns of exhaust-related particulate matter from diesel trucks, city and highway traffic, and loading dock operations.

Source: Garshick et al, Lung Cancer and Vehicle Exhaust in Trucking Industry Workers; *Environmental Health Perspectives* 116:1327–1332 (October 2008) [doi:10.1289/ehp.11293](https://doi.org/10.1289/ehp.11293).

Effects of Soot and Aerosols

Black Carbon from Asia could increase Warming

US climate scientists have warned that black carbon, sulfate and ozone from Asia could create summer hot spots in the central United States and southern Europe by mid-century.

The report says that reductions in surface transportation emissions have a net negative radiative forcing from short-lived gases and particles, primarily due to reductions in ozone and black carbon: as these are both pollutants at the surface, reducing emissions transport offers a way to simultaneously improve human health and mitigate climate warming.

Source: US Climate Change Science Program, available online at www.climatechange.gov/Library/sap/sap3-2/final-report/.

Acidification worsens effects of Soot

A paper from American and Swedish institutions shows that soot particles combine with other pollutants in the atmosphere to pick up an acid coating that may worsen their influence on smog and global warming. This atmospheric aging considerably alters the particles properties, morphology, and size. Model calculations have shown that, when associated with other non-absorbing aerosol constituents such as sulfate, soot seems more absorptive and exerts a higher positive direct radiative forcing. The authors

say that this has profound implications on visibility, human health, and direct and indirect climate forcing.

Source: Zhang et al, Variability in morphology, hygroscopicity, and optical properties of soot aerosols during atmospheric processing; *proceedings of the National academy of Sciences*, vol. 105, no.30 10291-10296 (2008) [doi: 10.1073/pnas.0804860105](https://doi.org/10.1073/pnas.0804860105).

Aerosols Pollution can affect Rainfall

An international team of scientists at the Hebrew University of Jerusalem, has concluded that air pollution can either increase or decrease rainfall depending on local environmental conditions. The practical result is that in relatively clean air, adding aerosols up to the amount that releases the maximum of available energy increases precipitation. Beyond that point, increasing the aerosol load even further lessens precipitation. Therefore, in areas with high atmospheric aerosol content, due to natural or human-made conditions, the continuation or even aggravation of those conditions can lead to lower than normal rainfall or even drought.

Source: Rosenfeld et al, Flood or Drought: How Do Aerosols Affect Precipitation? *Science* Vol. 321. no. 5894, pp. 1309 - 1313 (2008). DOI: [10.1126/science.1160606](https://doi.org/10.1126/science.1160606).

Urban Road Transport Emissions Projections to 2020

A paper from LAT, University of Thessaloniki, projects EU road transport emissions to 2020. Emissions were projected following current legislation (CLE) measures and a scenario representing maximum feasible technical reductions (MFR).

Projections to 2020 showed that compared to year 2000 levels, CLE will bring reductions of 89%, 25% and 50% in NO_x from gasoline passenger cars, diesel passenger cars and heavy-duty vehicles, respectively, when comparing average emissions on a per vehicle-km basis. The corresponding reductions in the MFR scenario were 91%, 53% and 67%, respectively. Following the CLE scenario, PM exhaust and non-exhaust emissions will decrease on a per vehicle-km basis by 61% for diesel passenger cars and 63% for heavy-duty vehicles. Reductions by MFR over the reference year are estimated in the order of 77% and 65% respectively.

Source: Kousoulidou, Ntziachristos, Mellios and Samaras, Road-transport emission projections to 2020 in European urban environments; *Atmospheric Environment*, Volume 42, Issue 32, Oct. 2008, Pp 7465-7475. [doi: 10.1016/j.atmosenv.2008.06.002](https://doi.org/10.1016/j.atmosenv.2008.06.002).

Effects of Ethanol-Diesel Fuel Blends on Performance and Emissions

Researchers from the National Technical University of Athens have published a paper on the use of 5% and 10% ethanol-diesel blends in a heavy-duty 6-cylinder Mercedes-Benz DI engine. Engines of this type are

used to power minibuses of the Athens Urban Transport Organisation. Tests were conducted using each of the above fuel blends at two speeds and three loads. Fuel consumption, exhaust smoke and regulated gaseous emissions were measured.

Source: Rakopoulos et al, Effects of ethanol–diesel fuel blends on the performance and exhaust emissions of heavy duty DI diesel engine; *Energy Conversion and Management*, Vol. 49, Issue 11 (Nov. 2008) pp 3155-3162. [doi:10.1016/j.enconman.2008.05.023](https://doi.org/10.1016/j.enconman.2008.05.023).

INTERNATIONAL

New International Limits on Ship Emissions

The Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) met from 6 to 10 October at IMO Headquarters in London. The committee adopted amendments to the MARPOL Annex VI regulations to reduce NO_x, PM and SO_x emissions from ships.

The revised Annex VI will allow for the designation of Emission Control Areas for SO_x and particulate matter, for NO_x, or for all three types of emissions. More stringent controls would apply in these areas. Amendments to the NO_x Technical Code, including a new Chapter on the agreed approach for NO_x regulation of existing (pre-2000) engines was also considered. The revised Code includes provisions for direct measurement and monitoring methods, a certification procedure for existing engines, and test cycles to be applied to specified engines.

From 1 January 2012, the allowable sulfur content in fuel for vessels will fall from the current 4.5% to 3.5% percent, with a further reduction to 0.5% due by 1 January 2020. New limits will also be applied to Sulfur Emission Control Areas, which cover the Baltic Sea and the North Sea area, the IMO said. Limits in those areas would be reduced from the current 1.5% to 0.10%, effective 1 January 2015.

The engine standards will cut NO_x emissions by 20% and will apply to new engines and to existing engines (as certified low-emission kits become available) beginning in 2011.

- For Tier I engines - diesel engines installed on ships constructed between 1/1/2000 and 1/1/2011 – the existing rules would be retained, meaning a NO_x limit of 17g/kWh.
- For Tier II engines - diesel engines installed on ships constructed after 1/1/2011, but before 2016 – NO_x limits would be reduced to 14.4g/kWh.
- For Tier III engines - those installed on ships constructed after 1/1/2016 - limits would be reduced to 3.4g/kWh while ships are operating in designated emission control areas. Outside emission control areas, Tier II limits would apply.

GENERAL

PCFV report shows Unleaded Petrol nearing the End

The Partnership for Clean Fuels and Vehicles shows information on expected dates for the transition to unleaded petrol, for those countries still using leaded fuel.

Using leaded fuel – at beginning 2008	Status September 08	Current estimate Likely to go Unleaded
Afghanistan	On track	2008
Algeria	Revision	2013
Bosnia-Herzegovina	In dialogue	2010
Iraq	To contact	2011
Jordan	Unleaded	
FYR Macedonia (2008)	On track	2009
Lao PDR	Unleaded	
Mongolia	Unleaded	
Montenegro	On track	2009
Morocco	On track	2008
Myanmar	To contact	2010
North Korea	To contact	2010
Palestine	Unleaded	
Serbia	In dialogue	2010/2011
Tajikistan	To contact	2010
Tunisia	On track	2008
Uzbekistan	To contact	2009
Yemen	Revision	2009
18 countries	14 countries	End 2008-11
New Additions		
Bhutan	?? Unleaded?	
Egypt	Added to the list	2010
Total	15	

Source: Partnership for Clean Fuels and Vehicles

Report on reducing Greenhouse Gas Emissions from Ships

Friends of the Earth International submitted a report on greenhouse gases to the IMO's Marine Environmental Protection Committee meeting. The report, 'Opportunities for Reducing Greenhouse Gas Emissions from Ships' prepared by Energy and Environmental Research Associates identifies the direct impacts of both Black Carbon (BC) and CO₂ on climate forcing, together with the indirect effect of NO_x and CO on tropospheric ozone.

The report says that the total warming effect of global BC emissions is estimated to be between 25% and 60% of that of annual CO₂ emissions and that international shipping emits BC at a rate of between 71 000 and 160 000 tonnes of per year. Reviewing

technological options, the report notes that DPF systems are "particularly effective at controlling BC, reducing emissions by 95 to 99.9% by mass."

Contribution of Ships to Pollution

A report issued by the Environmental Defense Fund on 3 October 2008 says that in 2001 ocean-going ships emitted as much nitrogen oxides (about 745000 tons) as that produced by 94 coal-fired power plants and as much particulate matter as 117 power plants.

The report also said emissions of nitrogen oxides from ships in the lower Mississippi Valley in the United States are equivalent to those from 18 million cars; ship emissions in the Seattle-Tacoma area are equivalent to those from 13 million cars; and emissions in the Los Angeles area are equivalent to those from 11 million cars. By 2030, without protective standards, ships will account for 34% of US mobile source NO_x emissions, 45% of mobile source fine particle emissions, and 95% of mobile source sulfur dioxide emissions, the report said. The report *Floating Smokestacks* used US EPA data.

FORTHCOMING CONFERENCES

Course on Ultrafine Diesel Particles and Retrofit Technologies for Diesel Engines

12-14 November 2008, Diamond Bar, California, US

Details at www.arb.cagov/diesel/verdev/wn/courseannouncement_savedate.pdf

The California Air Resources Board and the South Coast Air Quality Management District are co-sponsoring this 3-day course on the successful application of diesel particulate filter systems to diesel engines. The course will also cover research into ultrafine particles and the health risks they pose along with PM₁₀ or PM_{2.5}. There will be a demonstration of retrofit installations on the final day.

Better Air Quality BAQ2008

12-14 November 2008, Bangkok, Thailand

Details at www.baq2008.org

The theme "Air Quality and Climate Change: Scaling up win-win solutions in Asia" relates directly to the IPCC recommendation to integrate air quality management & climate change mitigation strategies.

ICAT-08 International Conference on Automotive Technologies

13-14 November 2008, Istanbul, Turkey

Details at www.icatconf.org

The main theme of this conference will be "Alternative Technologies for the reduction of CO₂ emissions". Topics include diesel engine development, durability and emissions, advanced diesel emissions controls and gasoline DI engines.

MTZ/Ricardo Conference – Heavy-duty On- and Off-Highway Engines

18-19 November 2008, Bonn, Germany

The focal point of this year's conference lies on developing new engines and forward-looking methods for reducing emissions. Key technologies such as fuel injection, turbocharging, innovative combustion processes and exhaust gas recirculation are just as much in the spotlight as hybrids as a drive alternative and investigations on interactions between exhaust gas treatment and diesel engines.

China Green Transport Summit 2008

24-25 November 2008, Beijing, China

Details at www.chinagreentransport.com

The key topics include green transport demands of China and the World, developing cleaner and better vehicles for the future, promoting innovation in environmentally friendly energy technologies and opportunities for engine optimization.

3rd Advanced Powertrain Control Symposium

27 November 2008, Birmingham, UK

Details at www.tic.ac.uk/news/news.asp?id=316

Sessions include one on alternative fuels, powertrains and hybrids and one on diesel emissions aftertreatment.

Diesel Engine Aftertreatment

27 November 2008, Paris, France

Details at www.sia.fr

Today's regulatory requirements impose the use of dedicated aftertreatment systems that are both complex and costly. The technological challenge is to develop systems that are more innovative, less costly, and more fuel efficient.

5th ACEM (Motorcycle) Conference

1 December 2008, Brussels, Belgium

Details at www.acem.eu/cms/2008conference.php

International CTI Forum NOx-Reduction

2-4 December 2008, Detroit, Michigan, USA

Details at www.emission-control-systems.com

Topics to be covered include the possibilities of reducing NOx for light and heavy diesel engines, engine improvements for NOx reduction, technologies, concepts, strategies and solutions for NOx reduction through emission aftertreatment, SCR system components, applications and strategies and urea infrastructure.

Truck & Bus World Forum: Sustainable Transport in the Global Economy

8-9 December 2008, Göteborg, Sweden

Details at www.tnbworldforum.com

Materials in Exhaust Gas Technology

10-11 December 2008, Munich-Freising, Germany,

Details: www.car-training-institute.com/materials-exhaust

16th Annual Handelsblatt Conference 'The Automobile Industry'

15-16 December 2008, Frankfurt/Main, Germany

Details at vhb.handelsblatt.com/automobil

Speakers include Wolfgang Tiefensee (German Federal Minister of Transport, Building and Urban Affairs), Philippe Jean (Head of the Automotive Industry Unit of DG Enterprise), Ivan Hodac (Secretary general of ACEA) and Lars Holmqvist (CEO of CLEPA).

Airborne Particles: Origins, Composition & Effects

16-17 December 2008, London, UK

Details at

www.londonair.org.uk/london/reports/Airborne_Particles_GF.pdf

The conference covers particle composition, optical and physical properties, health effects, sources and legislation, providing a broad and up-to-date survey.

7th International Colloquium Fuels

14-15 January 2009, Stuttgart/Ostfildern, Germany

Details at www.tae.de/fuels

The conference includes four sessions on emissions and their control and two on combustion processes and fuel requirements.

Partikelfilter-Nachrüstung von Dieselmotoren - Particle Filter Retrofitting of Diesel Engines

19-20 January 2009, Munich, Germany

Details at www.hdt-automotive.de

Topics include the morphology, composition and biological attributes of combustion particles, filtration mechanisms and performance, operating conditions, measurement procedures, legislative developments, and Low Emissions Zones,

7th International CTI Forum Exhaust Systems

26-29 January 2009, Düsseldorf, Germany

Details at: www.exhaustsystems-forum.com

Themes will include emission laws in international comparison, alternative fuels and effects on emissions, worldwide emission strategy for diesel engines in passenger cars, and current systems to reduce particulate and NOx.

Greenport 2009

25-26 February 2009, Naples, Italy

Details at www.green-port.net

This conference will provide delegates - tasked with creating or implementing environmental policies, regulations and procedures within Ports, Terminals,

Shipping lines, Transportation and Logistics companies - with a comprehensive and detailed Operational Guide that mixes shared experiences and academic analysis with case studies and innovative proposals.

15th Fuels & Lubes Asia

4-6 March 2009, Hanoi, Vietnam

Details will be at www.fuelsandlubes.asia

International Advanced Mobility Forum 2009 – Energy for Transportation 2050

10-12 March 2009, Geneva, Switzerland

Details at www.iamf.ch

Subject areas to be discussed include fuel strategies for future transport needs; biofuels, natural gas, CTL, & GTL; advanced internal combustion engines; auxiliary systems for improved efficiency; new powertrain concepts; and concepts of multi-modal mobility and options for future cargo transport. The forum will be held during the Geneva Motor Show.

Green Ship Technology 2009

24-25 March 2009, Hamburg, Germany

Details at www.lloydslistevents.com

CAPoC8 Eight International Congress on Catalysis and Automotive Pollution Control

15-17 April 2009, Brussels, Belgium

Details at www.ulb.ac.be/sciences/cpmct/capoc8

The conference covers all topics related to applications and requirements of catalysis in automotive emissions control - catalyst and sorption technologies, particulate emissions control, off-cycle emissions and unregulated pollutants, materials for catalysts, washcoat and fuel-borne catalysts, modelling, on-board reforming of fuels.

SAE 2009 World Congress

20-23 April 2009, Detroit, Michigan, USA

Details at www.sae.org

Challenge Bibendum 2009

26-29 April 2009, Rio de Janeiro, Brazil

Details at www.challengebibendum.com

Challenge Bibendum gathers entrepreneurs, industrialists and scientists, from countries around the globe to share their technologies, visions and roadmaps with policymakers and media.

Additives 2009: Fuels and Lubricants for Energy Efficient and Sustainable Transport

27-30 April 2009, York, UK

Details at www.rsc.org/Additives2009

The meeting aims to provide a multi-disciplinary forum to share ideas for future developments in the science and technology of fuels and lubricants.

5th AVL International Commercial Powertrain Conference

28-29 April 2009, Graz, Austria

Technical sessions will cover emissions compliance, hybrid powertrains, alternative fuels and electronic systems including OBD.

FISITA 2010: Automobiles and Sustainable Mobility

30 May – 4 June 2010, Budapest, Hungary

Details at www.fisita2010.com

The main topics will include environment-friendly vehicles and powertrains, vehicles standards, regulations and legislation and special questions for buses and trucks.

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

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

The main topics will be research and reduction of emissions, development of aftertreatment devices for gaseous emissions and for (nano)particulates, lube oils & fuels, CO₂ 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

13th ETH Conference on Combustion-Generated Nanoparticles

22-24 June 2009, Zurich, Switzerland

PTNSS International Congress on Combustion Engines

22-24 June 2009, Opole, Poland

Details at www.ptnss.pl/kongres

12th EAEC European Automotive Congress

29 June - 1 July 2009, Bratislava, Slovakia

Details at <http://www.eaec2009.com>

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