



Newsletter

March - April 2010

INTERNATIONAL REGULATORY DEVELOPMENTS

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EUROPE

European Commission Communication on Clean and Efficient Vehicles

On 28 April 2010 the European Commission published an official Communication on Clean and Energy-Efficient Vehicles.

The document provides an 'Action plan for green vehicles'; research and innovation measures; specific actions on CO₂ and on electric vehicles; market uptake and consumer information; employment considerations; global issues including promotion of UN-ECE activities; and governance issues. The latter includes re-launching the CARS21 high level group, implementing the European Climate Change Programme, a white paper on European transport policy and co-ordination of Member States' actions affecting the internal market.

The 'Action plan for green vehicles' covers continuing measures for reducing emissions, including:

- a new Regulation on Type Approval of two- and three-wheelers and quadricycles;
- implementing measures for the car CO₂ Regulation;
- revision of the emissions test cycle, by 2013 at the latest, to ensure the reduction of CO₂ and pollutant emissions under real-world driving conditions. Also a "robust procedure" to measure real-world emissions using PEMS to be developed by 2012;
- preparation of a strategy on fuel consumption and CO₂ emissions from heavy-duty vehicles;
- a proposal (by 2011) to reduce the fuel consumption impacts of mobile air conditioning.

In 2011 the long-term strategy on research is to be outlined in the Strategic Transport Technology Plan and a Communication on Clean Transport Systems. Other actions listed include an amendment to the Car Labelling Directive 1999/94/EC and monitoring the implementation of Directive 2009/33/EC on the promotion of clean and energy-efficient vehicles. A mid-term review of car and van CO₂ emissions legislation is to be undertaken by 2013.

The Commission's Communication is available at http://ec.europa.eu/enterprise/sectors/automotive/competitiveness-cars21/energy-efficient/index_en.htm.

Amending Directives published for NRMM and Tractors

The comitology Directive to implement the provisions necessary to allow Stage IIIB emissions approvals for Non-Road Mobile Machinery (NRMM) was published in the EU's Official Journal on 1 April 2010 as Commission Directive 2010/26/EU.

Gaseous and particulate emissions now have to be measured on both the NRSC and the NRTC tests for

Stages IIIB and IV. Details of the cold-start NRTC procedure are also corrected, as are references to the ISO 8178-4 test cycle, used for inland waterway vessel engines. Measures to ensure the correct operation of NOx control systems such as monitoring of low reagent levels, reagent quality and dosing are incorporated and there is a requirement that ammonia emissions must not exceed a mean of 25 ppm over the test cycle. The density of reference fuel is amended to 833 - 865 kg/m³.

The Directive also extends until 31 July 2013 the Stage II derogation for professional multi-positional, hand-held hedge trimmers and top handle tree service chainsaws using engines of classes SH:2 and SH:3.

On 10 April 2010 Commission Directive 2010/22/EU was published in the Official Journal. This amends the Directives on the Type-Approval of agricultural or forestry tractors. In addition to numerous safety-related amendments, new letters (C, D and E) following the base directive number in the EC Type-Approval number are attributed to emissions Stages IIIA, IIIB and IV engines respectively. In the current emissions Directive (2000/25/EC), only A for Stage I and B for Stage II were originally defined.

European Commission issues Work Plan for 2010

On 31 March 2010 the Commission published its work programme for 2010. Two key areas related to transport and the environment are a white paper on the future of transport and the development of a vision for Europe's transition to "a low carbon, resource efficient and climate resilient economy by 2050".

An Annex lists a number of initiatives, including a new Regulation (including emissions requirements) for mopeds, motorcycles, tricycles and quadricycles and their components; the replacement of 24 Directives on Tractors by one Regulation plus a new Commission Directive; changes to Directive 94/25/EC (recreational craft) to improve noise and exhaust emissions; and changes to Directive 97/68/EC on Non-Road Mobile Machinery (NRMM) emissions.

Commission says Stricter Emissions Limits for Trains are Achievable

The European Commission said on 26 April 2010 that the engine technology to meet the stricter NOx and PM limits for locomotives due to come into force in 2011 can be met. The Commission is due to table detailed proposals for implementing these Stage IIIB standards by the end of this year as part of a revision of the NRMM Directive. However, officials also acknowledged the sector probably needs some flexibility to meet the new requirements, in line with that granted to other sectors.

Review of Environmental Type Approval Legislation and Hydrogen Vehicles

A consortium led by TNO has completed a report for the Commission reviewing environmental Type Approval legislation with a view to amendments needed to accommodate hydrogen-powered vehicles.

The main recommendations are that:

- Compared with the emissions limits of Euro 5 and Euro 6 only NO_x emissions are of interest for hydrogen internal combustion engines. Hydrogen fuel cell vehicles do not emit any of the regulated pollutants, therefore emissions testing for fuel cell vehicles seems unnecessary. It is, nevertheless, proposed to investigate the exact exhaust gas emissions of hydrogen-powered vehicles. The measurement methods for pollutant emissions were identified not to be appropriate for hydrogen powered vehicles due to the lack of carbon atoms. Finally a proposal of hydrogen reference fuels for internal combustion engines and Proton Exchange Membrane fuel cells is included.
- Instead of the declaration of CO₂ emissions, the consortium suggests that the global warming potential of the different GHGs could be taken into account and reported as "equivalent CO₂ emissions per km". Energy consumption, (kWh/km and/or MJ/km) should be used in place of fuel consumption.

Commission Action on PM₁₀ Air Quality and Emissions Non-Compliances

The European Commission is pursuing infringement proceedings against five Member States that have failed to comply with the EU's air quality standards for PM₁₀ under the 2005 Air Quality Directive. Slovenia and Sweden are being referred to the European Court of Justice, while final written warnings have been sent to Cyprus, Portugal and Spain. Bulgaria will receive a final written warning over its failure to control SO₂.

The Commission has, though, granted Germany additional time (to 11 June 2011) to comply with the PM₁₀ legislation in five additional zones in the Länder of North-Rhine Westphalia and Saxony.

Austria's failure to notify national measures on Directive 2008/74/CE (aligning the scope of heavy-duty Euro IV/V with light-duty Euro 5/6) has been referred to the European Court of Justice (ECJ). The national implementation of this Directive should have been published by 2 January 2009.

Austria and Sweden are also being sent final warnings over industrial installations operating without permits that should have been issued by 30 October 2007 under the IPPC directive. Romania will receive a final warning for failing to take action over a formaldehyde plant built in 2007 without an environmental impact

assessment (EIA) and Ireland is being sent two final warnings over its failure to comply with 2008 ECJ rulings on breaches of impact assessment rules.

Council of Ministers' Common Position on Industrial Emissions (IPPC)

The EU's Council of Ministers has reached a Common Position on the proposed revisions to the Integrated Pollution Prevention and Control (IPPC) Directive on emissions from industrial sources. The Council and the European Parliament were unable to reach agreement at the Parliament's first reading last year. The Common Position incorporates some of the amendments proposed by Parliament.

The Common Position does not include the Commission's original proposal to extend the scope of the Directive to 20-50 MW installations. It does, though, bring forward from 2016 the application date of the standards for new large combustion plants. It lays down different emissions limit values for plants operating ≤1500 hours annually and introduces minimum desulfurisation rates for plants which are not able to meet the emissions limit values for SO₂, even when Best Available Techniques (BAT) are applied, "due to the specific characteristic of the indigenous solid fuels being used." The proposal also requires the Commission to review limits and establish new limits for plants not currently subject to minimum standards. If appropriate, the Commission has to make a legislative proposal on this by the end of 2013.

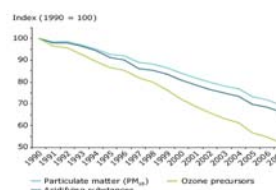
Further changes would exclude small individual units of ≤15 MW from the rules determining the total capacity of a combustion plant composed of several units discharging through a common stack. The Council also proposes two 'flexibilities'. One allows a transitional plan covering a number of installations, and the second offers possible exemption for certain district heating plants, for plants with a limited lifetime and for plants that are part of small isolated systems.

The Council proposal is available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0067:FIN:EN:PDF>.

EEA TERM 2009 Report: Is Europe's Transport getting Greener?

A new report from the European Environment Agency (EEA) says that while technological advances produce cleaner vehicles, increased passenger and goods mileage are offsetting efficiency gains.

Despite recent reductions in air pollutant emissions, EEA says, road transport was the largest emitter of nitrogen oxides and the



Transport Emissions of regulated air pollutants in EEA member countries. Source: EEA TERM 2009

second largest contributor of pollutants forming particulate matter in 2007. Passenger cars are among the top six individual polluting sources for NO_x and particulate matter (PM₁₀, PM_{2.5}), as well as CO and non methane volatile organic compounds (NMVOC) emissions. Heavy-duty vehicles were the most important source of NO_x emissions and are a key source of CO, PM_{2.5}, PM₁₀ and NMVOC.

The EEA report is available from www.eea.europa.eu/publications/towards-a-resource-efficient-transport-system.

DG Environment Project on Industrial Emissions of Nano/Ultrafine Particles

On 17 March 2010, the Commission's Directorate-General for Environment issued a tender notice for work on the industrial emissions of nano- and ultrafine particles with the objective of helping to set priorities for policies directed towards their regulation.

Key objectives of the project are to:

- summarise current knowledge on atmospheric releases of nanomaterials and ultrafine particles;
- analyse the characteristics, dynamics, and health and environmental impact of nanomaterials and ultrafine particles released by industrial processes;
- provide recommendations on how to address identified knowledge gaps;
- review EU legislation on industrial emissions to determine whether it addresses releases of nanomaterials and ultrafine particles appropriately;
- develop policy options for the regulation of nanomaterials and ultrafine particles in EU legislation related to industrial emissions.

EU Ozone Levels were lower in 2009

The European Environment Agency (EEA) report on air pollution across Europe during the summer of 2009 says that levels were amongst the lowest since comprehensive data reporting started in 1997.

For the first time since 1997, no concentration higher than 300 µg/m³ was reported. The highest one-hour ozone concentration (284 µg/m³) was recorded in France. In contrast to previous summers, in 2009 there were no widespread multi-day episodes. As in all previous years, though, the EU Air Quality Directive's long-term objective to protect human health (maximum ozone concentration of 120 µg/m³ over 8 hours) was exceeded in all EU Member States and other European countries. EEA says it seems likely that reductions in anthropogenic ozone precursors in Europe contributed significantly to the general decrease in peak ozone concentrations.

EEA Technical report No. 2/2010, 'Air Pollution by ozone across Europe during summer 2009', is at www.eea.europa.eu/publications/air-pollution-by-ozone-across-europe-during-summer-2009.

UK Budget introduces Euro VI and Low CO₂ Tax Incentives

The UK Budget presented on 24 March 2010 included an announcement that Reduced Pollution Certificates, which provide heavy goods vehicles with a discount of up to £500 (+/- €560) on their annual circulation tax will be available for vehicles that achieve early compliance with the Euro VI standard. This will be awarded for five years only. Details are to follow at a later date.

The budget also halved the company car tax for drivers of company-owned cars with CO₂ emissions of 1 to 75 g/km (when they become available). The benefit-in-kind tax rate for such vehicles will be 5% of the vehicle list price from April 2010. Drivers of zero-emissions cars will pay no benefit-in-kind tax for 5 years, a measure that had already been announced.

UK Reports on Air Quality

A report published on 3 March 2010 by the UK's Environment Department (DEFRA), says that the country could save £24 billion (€26.5 billion) through joint measures on air pollution and climate change. The report says that despite significant improvements in recent years, the effects of air pollution are still costing the UK around £15 billion (€16.5 billion) each year. 'Air Pollution: Action in a Changing Climate' is at www.defra.gov.uk/environment/quality/air/airquality/strategy/documents/air-pollution.PDF.

On 22 March 2010 the UK Parliament's Environmental Audit Committee issued a report on Air Quality saying that air pollution is contributing to tens of thousands of early deaths each year and the Government is not doing enough to tackle the problem. The committee also warns that Britain could face substantial fines if it continues to breach EU air quality targets.

According to evidence presented to the Committee's inquiry, air pollution could be contributing to as many as 50 000 deaths per year through asthma, heart disease and respiratory illness. Averaged across the whole UK population it is estimated that poor air quality is shortening lives by 7-8 months. In pollution hotspots it could be cutting the most vulnerable people's lives short by as much as 9 years. Despite these impacts, very little effort is being put into reducing air pollution, compared with efforts to tackle smoking, alcohol misuse and obesity, the report says.

The Committee says that air pollution from road vehicles causes the most damage to health. A dramatic shift in transport policy is required if air quality is to be improved. This means removing the most polluting vehicles from the road, cleaning up the vehicles that remain and encouraging smarter choices about transport. Many of these policies have the

added benefits of tackling climate change by reducing CO₂ emissions, the Committee says.

The report is available on the Committee's website www.publications.parliament.uk/pa/cm/cmenvaud.htm.

London Mayor launches Plans to Reduce PM₁₀ and NO₂ Hotspots

On 28 March 2010 the Mayor of London launched his strategy to tackle the city's air pollution. The plan, which is open for public consultation, aims to control pollution hotspots to meet EU targets for particulate matter by 2011 and to ensure that 250 km of "the dirtiest roads" meet NO₂ air quality targets by 2015.

The Mayor says that the latest figures show London is on track to meet PM₁₀ legal limits by 2011, but several areas have been identified as being most at risk of breaching limits when weather conditions are poor. Potential solutions that could be applied include deploying the cleanest buses along these routes; no-idling enforcement to stop people leaving their engine running for long periods; power washing or applying dust suppressants on road surfaces; changes to traffic signal timings to smooth the flow of traffic; and planting green walls and trees to absorb particulates.

Measures on NO₂ to enable the 2015 air quality targets to be met include retrofitting older buses with equipment to bring them up to Euro IV standards for NOx and the introduction of a new NOx standard for larger vehicles that have to comply with the Low Emission Zone standards. The Mayor also confirmed that the Low Emission Zone will cover heavier vans and minibuses from January 2012.

In addition, the Mayor proposed to introduce age limits for taxis and minicabs and committed to work with the vehicle manufacturing industry to develop a black cab that emits 60% less pollution by 2015, and a zero-emission black cab by 2020. He is also discussing how the London Lorry Control Scheme can be used to incentivise a cleaner 'London lorry' standard.

The air quality strategy is at www.london.gov.uk/priorities/environment/vision-strategy/air-quality.

Dutch question Benefits of Euro V in Urban Areas

Lorries meeting Euro V pollution standards emit three times more NOx than they are supposed to in urban areas, according to a Dutch note to EU Environment Ministers citing a study by TNO. The study found that Euro V lorries in urban areas are only marginally cleaner than more polluting Euro III vehicles.

The note says that Euro standards are set on the basis of laboratory tests. These appear to correspond well to conditions for motorway driving, but not urban driving. The Netherlands asked EU Environment

Ministers meeting in Brussels on 15 March 2010 to take the findings into account for Euro VI standards and to request the European Commission to include the use of PEMS (Portable Emissions Measurement Systems) in order to reduce effectively NOx emissions under all driving conditions.

The Dutch also suggest the European Commission should negotiate an agreement with lorry manufacturers to modify the calibration software of Euro V vehicles.

Italian Environmental Assessment sees 'Unhealthy Days' Increase

The technical wing of Italy's Ministry of Environment - Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA – formerly APAT) has published Italy's Environmental Data Yearbook for 2009. The organisation said the report *Annuario dei Dati Ambientali 2009* presents the bleakest picture ever. The number of days in which air quality was considered unhealthy in one or more of Italy's 30 largest cities increased to 417 days in 2009, from 279 in 2008 and 249 in 2007. The yearbook is at www.apat.gov.it/site/contentfiles/00158000/158083_temati_che_in_primo_piano2009.pdf.

Austrian Expert Forum on NOx

An Expert Forum on 'technologies to meet future nitrogen oxide limits' was organised on 19 March 2010 by ÖAMTC (Österreichische Automobil-, Motorrad- und Touring Club) and the Institute for Vehicle Propulsion and Automotive Engineering at the Technical University of Vienna.

Participants were told that the feasibility of achieving the EU air quality standards is questionable and that the main cause is traffic, specifically diesel vehicles. NO₂ measurements exceeded annual limits at 21 of Austria's 150 monitoring stations in 2008 and at 20 in 2009. The main problems are at stations close to intense vehicle traffic, especially in larger cities.

Hans Puxbaum of the Technical University of Vienna, said that the introduction of Euro 5 would result in a slight improvement of the NO₂ pollution situation in Austria, with the EU limits exceeded only in highly polluted measuring points. With the effectiveness of Euro 6 in the years after 2015, exceedences of the EU limit values are expected to belong to the past, he said. However, Günter Lichtblau of the Federal Environmental Agency said that without further measures, a reduction of NO₂ is expected only in 2013 and to enforce national air quality limits in 2015 is questionable. Meeting the limits calls for a combination of economic, legal and organisational measures, in addition to technical improvements, he

said. These should include fiscal measures to reduce the number of diesel vehicles in Austria.

Representatives of PSA Peugeot Citroën, Volkswagen and Daimler also saw the current EU standards as a challenge, suggesting that the industry needs to accelerate technical developments that allow for nitrogen reduction while saving fuel. It was also suggested that differences in legislation around the world impede the development of a globally deployable diesel exhaust aftertreatment system.

Russia, Belarus and Kazakhstan push for Zero Import Duty on Euro V Trucks

BelaPAN reports that the Transport Ministries of Belarus, Kazakhstan and Russia intend to petition the Commission of the Customs Union to introduce a zero duty on the import into the three countries of trucks equipped with engines that meet the Euro V and higher emissions standards. Under the proposal, the zero duty would apply only to trucks to be used in international freight transportation.

Russia, Belarus and Kazakhstan launch Joint Project to combat Air Pollution

The Russian Federation with Belarus and Kazakhstan announced on 13 April 2010 the launch of their joint project to implement and ratify the Heavy Metals, POPs, the Gothenburg Protocol and the UN-ECE's Convention on Long-range Transboundary Air Pollution.

The project will assist the countries in developing national strategies to combat some of the most harmful air pollutants. The project aims at the implementation of best available technologies, emissions inventories and a policy framework to guide the reduction of harmful emissions of pollutants such as lead, cadmium, mercury, persistent organic pollutants, sulfur dioxide, and ammonia amongst others. This initiative is part of the Convention's efforts to foster the implementation and ratification of the Convention and its protocols in countries of Eastern Europe, the Caucasus and Central Asia. The Convention is conducting similar projects in South-Eastern Europe: in Albania, Bosnia & Herzegovina, Moldova, Montenegro, Serbia and Macedonia.

Croatia to subsidise Eco-Friendly Trucks and make 10 ppm S Fuel available

The Croatian government has pledged 46 million kunas (€6.3 million) in subsidies to help hauliers buy 639 new Euro V trucks to replace older vehicles. The Association of Croatian Road Hauliers said that companies active in international transport have around 7 000 trucks in operation, "of which 1 500 will no longer comply with EU standards in 2011." A truck

that was allowed to go through Slovenia could be potentially fined between 17 000 and 30 000 Euros if it entered Austria, the association said. Only 28% of the rolling stock in Croatia is less than 10 years old, State Secretary for the Transport Drazen Breglec said.

Meanwhile Croatia's INA (Industrija Nafta d.d.) introduced 10 ppm sulfur 'Euro 5' fuels on 1 April 2010. The company says the new Euro-super BS 95 petrol and Euro-diesel BS diesel fuel fully comply with the requirements of EN 228 and EN 590, respectively. The fuel will initially be available at 40 filling stations and gradually rolled out to others.

NORTH AMERICA

US Greenhouse Gas Rules adopted; Canada proposes Harmonisation

On 1 April 2010, the US Department of Transportation (DOT) and the US Environmental Protection Agency (EPA) jointly established new federal rules setting national greenhouse gas emissions and fuel economy standards. The US has also worked closely with Environment Canada to ensure a common North-American approach, and Canada has also announced Light-duty Vehicle GHG-Emissions regulations.

The new US rules, applicable for all States, establish increasingly stringent fuel economy standards under the Corporate Average Fuel Economy programme and greenhouse gas emissions standards under the Clean Air Act for 2012 to 2016 model-year vehicles. Starting with 2012 model year vehicles, manufacturers must improve fleet-wide fuel economy and reduce fleet-wide greenhouse gas emissions by approximately 5% every year. By the 2016 model-year, manufacturers must achieve a combined average vehicle emission level of 250 g CO₂ per mile.

On 17 April 2010, Environment Canada published draft regulations to harmonise Canada's greenhouse gas emissions standards for new vehicles with those being implemented by EPA. The proposed Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations are open to 60 days of public comment before publication in final form in the Canada Gazette, Part II.

Status Report on US Air Quality

A status report on air quality in the US "Our Nation's Air – Status and Trends through 2008" has been released by the US Environmental Protection Agency (EPA). The report says that since 1990, nationwide air quality has improved significantly for ground-level ozone, PM_{2.5} and PM₁₀ particulates, NO₂, CO, SO₂ and lead. It also comments that cleaner cars, industries, and consumer products have contributed to cleaner air for much of the US.

In addition total emissions of toxic air pollutants such as benzene, 1,3-butadiene, and toluene, decreased by approximately 40% between 1990 and 2005. Despite the progress, though, approximately 127 million people live in areas that exceeded any national ambient air quality standard in 2008. Ground-level ozone and particulate pollution still present challenges in many areas of the country, EPA says.

The report (www.epa.gov/airtrends/2010/index.html) also discusses the effects of international transport on climate change. It notes that Black Carbon has warming effects, while aerosols containing sulfates and organic carbon tend to have cooling effects.

California proposals on Evaporative Emissions from Recreational Vehicles

The California Air Resources Board (CARB) has issued draft proposals to regulate evaporative emissions from Off-Highway Recreational Vehicles (OHRVs) and On-road Motorcycles.

The proposed regulation would set evaporative emissions standards over a 'tip test' (equipment tilted 35 ± 5 degrees in each direction), running loss test, hot soak test and diurnal test. Limits for the sum of these 4 tests would be 1.75 g/test for model years 2014 to 2018 and 1.25 g/test for 2019 and subsequent model years. There would be an on-board refuelling vapour recovery standard of 0.25 g per gallon filled. Gas and electric units with diurnal emissions $\leq 50\%$ of the standard would earn credits, to be used in the same model year. For small volume Sand Car manufacturers there would be design requirements on fuel hose and fuel tank permeation and carbon canister working capacity.

California to ease Requirements on Existing Diesel Emissions

On 22 April 2010, the California Air Resources Board (CARB) decided to ease their regulations designed to reduce diesel emissions from existing trucks and construction equipment. However, full details will not be known until a detailed proposal is released later this year.

With construction activity only half the level it was when CARB adopted the regulations, the expected emissions from these on- and off-road sources of diesel particulates and nitrogen oxides are below targets set in the regulations. Also, CARB's discovery that it overestimated emissions from the off-road category creates an emissions 'cushion' that allows the agency to make the rules less onerous in the early years. The regulations as originally enacted require owners to install diesel exhaust filters and replace engines and/or purchase newer equipment and vehicles on prescribed schedules over several years.

California introduces Ferries with SCR and looks for Demonstration Projects

Two diesel-engined ferries using Selective Catalytic Reduction (SCR) to control NO_x emissions have entered service in California's San Francisco Bay.

The two MTU Series 2000 engines used in each ferry are able to operate on a biodiesel/ultra-low-sulfur diesel fuel blend. The specification for the ferries required emissions to be 85% below the US Environmental Protection Agency's Tier 2 marine emissions requirements at 25 knots and 85% load. Testing results by the ferry operator showed that emissions approximate to EPA's Tier 4 marine requirements, due to go into effect in 2016.

The California Air Resources Board (CARB) has also announced the availability of grants for an Advanced Technology Demonstration Project for demonstration of the hybridisation of an existing marine vessel. In another project, CARB is offering grants for an \$800 000 (€595 000) Advanced Technology Demonstration Project for aftertreatment devices on existing locomotive engines operating in California.

Port of New York/New Jersey launches Clean Truck Programme

The Port Authority of New York and New Jersey and US Environmental Protection Agency have launched a \$28 million (€21 million) programme to replace pre-1994 trucks serving the ports with newer models that generate less pollution and greenhouse gases.

There will also be a truck phase-out plan in which pre-1994 model trucks will be excluded from Port Authority marine terminals from 1 January 2011. From 1 January 2017, trucks not equipped with engines that meet or exceed 2007 federal emissions standards will no longer be able to call on the terminals.

The Port Authority has also begun three other initiatives. The Ocean-Going Vessels Low Sulfur Fuel Program will offer financial incentives to encourage the use of low-sulfur fuel by operators of ocean vessels. The Cargo Handling Equipment Fleet Modernization Program will reimburse port tenants for 20% of the cost of replacing existing cargo handling equipment with new equipment that meets federal on-road emissions standards or the most recent federal off-road emissions standards. In addition two switcher (shunting) locomotives serving the ports will be retrofitted with ultra low-emitting GenSet technology.

New York State developing Clean Construction Equipment Database

The New York State Energy Research and Development Authority has issued a request for proposals to create an internet database intended to

provide information on Best Available emissions control Technology (BAT) for diesel construction equipment used in the state. Proposals for the project are being sought from groups with expertise in both web-based information systems and diesel emissions control technologies. Funding of \$500 000 (€370 000) is expected to cover costs for 2 years.

Texas proposes Funding for NOx-Reduction Technologies

The Texas Commission on Environmental Quality (TCEQ) has announced that it is seeking applications for technology projects focused on reducing air pollutant emissions, primarily NO_x, from mobile and stationary sources in Texas.

The aim of the programme is to aid the development, verification, and commercialisation of technologies to reduce emissions under the Texas Emissions Reduction Plan or State Implementation Plan. This includes retrofit systems and other advanced technologies that reduce NO_x emissions from existing equipment and engines by at least 25% without significantly reducing fuel economy.

Clean Diesel Grants for Kansas City

A grant to fund clean diesel projects within the Kansas City metropolitan area has been announced by the Missouri Department of Natural Resources. The grants will reimburse vehicle owners for the purchase of diesel retrofit or idle reduction technologies, replacement engines and vehicle replacements. It will be applicable to medium- and heavy-duty trucks; buses; construction, mining, cargo handling and agricultural equipment; stationary diesel engines; locomotives; and marine engines.

Energy and Utility Groups challenge EPA Short-Term NO_x Standard

Refiners and utilities are challenging the USA Environmental Protection Agency's recently issued NO₂ standard. Petitions were filed with EPA and the US Court of Appeals for the District of Columbia on 12 April 2010, arguing that the standard is unjustified and could lead to unreasonably stringent permit limits.

EPA retained its existing 53 ppb annual average standard designed to protect human health against long-term exposure, but also established a new one-hour standard of 100 ppb to protect against short-term exposures. The short-term standard is at the less stringent end of the 80 to 100 ppb range EPA had proposed, but is within the range recommended by EPA's Clean Air Scientific Advisory Committee.

The American Petroleum Institute and the Utility Air Regulatory Group say in their petitions that EPA should reconsider the standard due to the agency's

"arbitrary and scientifically unjustified dismissal" of analysis by an industry consultant and the agency's alleged failure to specify implementation provisions.

Lead Emissions from Piston-Engine Aircraft using Leaded Aviation Gasoline

The US Environmental Protection Agency (EPA) has issued an Advance Notice of Proposed Rulemaking (ANPR) in preparation for a decision on whether lead emissions from aircraft using leaded aviation gasoline (avgas) cause or contribute to air pollution which may endanger public health or welfare.

Emissions of lead from piston-engine aircraft using leaded avgas comprise approximately half of the national inventory of lead emitted to air. The ANPR describes and requests comment on the data available for evaluating lead emissions, ambient concentrations and potential exposure to lead from the continued use of leaded avgas in piston-engine aircraft. It has been issued as part of the response to a 2006 petition submitted by Friends of the Earth.

SOUTH AMERICA

Chile acts on Particulate Matter and Pollution in Santiago

On 16 April, the Chilean government published an updated version of its Decontamination Plan to clean up Santiago's polluted air. The plan, which appeared in the country's official gazette, *Diario Oficial*, includes stricter standards for fuels, new emissions standards for light vehicles and motorcycles, more inspections of catalytic converters, obligatory particle filters on buses, and targets for industry to reduce emissions of particulate material, sulfur dioxide, and nitrogen dioxide, among other measures.

The only part of the plan that requires congressional approval is a proposal on breathable particulate matter, which is supported by the Council of Ministers of Chile's National Environment Commission. Under this proposed legislation, levels of PM_{2.5} would have to annually average no more than 25 µg/m³ by 2012, 20 µg/m³ by 2022, and 10 µg/m³ by 2032.

The plan requires diesel and gasoline sold in the Santiago Metropolitan Region starting in 2011 to contain less than 15 parts per million of sulfur, compared to 50 ppm currently. The government also will issue a decree lowering the maximum sulfur content of paraffin, widely used for domestic heating, from 500 ppm to 100 ppm from April 2012.

By 1 September 2012, all buses in the Transantiago public transport system must have particle filters installed. Together with plans to retire the oldest vehicles, this will help make Transantiago the cleanest public transport system in Latin America, Environment

Minister Maria Ignacia Benitez said. The government also will impose stricter emissions standards on new light vehicles and motorcycles from 1 September 2011, and will introduce incentives for the purchase of low- or zero-emission vehicles.

By the end of 2010, major industrial emitters must cut emissions of nitrogen dioxide and particulate matter to half of 1997 levels and must reduce emissions of sulfur dioxide to the equivalent as if they were burning natural gas. The government also plans to introduce a limit for particle emissions from new wood stoves.

ASIA PACIFIC

Bharat Stage IV enters Force in Large Indian Cities

The Bharat Stage IV emissions regulations (equivalent to Euro 4) entered force in 13 Indian metropolitan areas on 1 April 2010. The introduction of Bharat Stage III (Euro 3) to the rest of the country has been postponed until 1 October 2010.

The government has also asked oil companies to sell Bharat Stage III petrol and diesel in Chhattisgarh, Madhya Pradesh and Maharashtra by 1 June 2010. Goa started selling it on 1 April 2010. The Petroleum Ministry has assured the Environment Pollution (Prevention & Control) Authority that oil companies will sell Bharat-III fuel in 17 other states and Union territories by 1 July 2010. By 1 October, Bharat-III fuel will be available in all pumps across the country. The sulfur levels for Bharat Stage III diesel and petrol are 350 ppm and 150 ppm respectively.

Bharat Stage IV (50 ppm S) diesel and petrol are already being sold in 13 cities and is due to go on sale in several other states by July 2010.

Indian Actions to support New National Air Quality Standards

On 20 April 2010 the Indian Minister of State for Environment and Forests, said in a written reply to a question that the Central Government has now undertaken the task of developing protocols for monitoring ambient air for the new National Ambient Air Quality Standards (NAAQS) announced in November 2009. These steps include:

- the notification of emissions standards for various categories of industry under the Environment (Protection) Rules, 1986;
- the implementation of action plans for air quality improvement in 16 cities apart from Delhi;
- the implementation of cleaner fuels for control of vehicular pollution;
- enforcement of the 'Pollution Under Control (PUC)' certificate scheme to check exhaust emissions from in-use vehicles;

- the sale of 2T pre-mix petrol for two stroke two- and three-wheelers;
- the implementation of more stringent emissions norms for generator sets;
- the implementation of the recommendations of the Charter on Corporate Responsibility for Environment Protection (CREP) for seventeen categories of polluting industries; and
- monitoring of air polluting industries for compliance with the emissions norms.

Inventory of NOx and PM due to Diesel Vehicles in Delhi

A new study assessed the impact of diesel vehicles on NOx and PM emissions at various locations in Delhi, using two line source models; the California line source version 4 and the Indian Institute of Technology line Source. The models offer comparable results but both under-predict the observed values, with the Indian Institute of Technology model predictions being slightly better. The analysis also identifies hotspots due to concentrations of NOx and PM and their diurnal variations are found to be greater in night hours.

Source: Goyal et al., Air Quality Impact Assessment of NOx and PM due to Diesel Vehicles in Delhi, *Transportation Research Part D: Transport and Environment*, [doi:10.1016/j.trd.2010.03.002](https://doi.org/10.1016/j.trd.2010.03.002).

Hong Kong proposes SCR Retrofit Trial

Following a question in the Hong Kong Legislative Council, the Secretary for the Environment said that diesel oxidation catalysts have already been installed on all pre-Euro and Euro I franchised buses and, where technically feasible, franchised bus companies are retrofitting their Euro II and III buses with diesel particulate filters. This is expected to be completed within 2010. Franchised bus companies have also fully switched to diesel fuel with sulfur below 10 ppm.

The Secretary for the Environment, Mr. Yau also said that all commercial and public buses in the Hong Kong Special Administrative Region that do not meet any of the Euro emissions standards will be retired by 2012, those that meet only Euro I standards will be retired by 2015, and Euro II buses will be phased out by 2019.

As regards NOx, Mr Yau said, it is now technically feasible to retrofit buses of some newer models (such as Euro II and III) with Selective Catalytic Reduction (SCR). The experiences of London and Belgium show that the devices can reduce NOx emissions by about 60%, enabling them to meet Euro IV or higher emissions standard for NOx. Following a visit to Transport for London (TfL) and a bus operator in Belgium, the Hong Kong SAR Government now plans to conduct an SCR retrofit trial locally, Mr. Yau said.

Hong Kong and Guangdong to work together on Pollution and Clean Cars

On 7 April 2010, the Hong Kong Special Administrative Region and neighbouring Guangdong province signed an agreement to cooperate more closely on planning and development in China's Pearl River Delta, including the alignment of key policies affecting the environment.

The agreement states that Hong Kong and Guangdong should cooperate on creating fuel and emissions standards for vehicles and ships more stringent than the national level. The agreement also states that the partners should jointly foster research and development of electric vehicles, support the growth of a manufacturing and parts industry for electric vehicles, and encourage use of electric vehicles, specifically in major urban areas such as Hong Kong, Shenzhen, and Guangzhou.

MIDDLE EAST

Egypt tackling Air Pollution

An effort to take old vehicles off the road and to switch to natural gas-powered taxis is paying off in improved air quality, an Egyptian Environment Ministry spokesman said on 31 March 2010. The ministry has been documenting concentrations of airborne particles in Cairo. In January 2009, there were nearly 3 000 parts per million in some areas. "Today, however, we have seen this number drop to 2 000 and we believe it is the new laws that have really done well in curtailing this," he said. A report published by the ministry on 24 March 2010 said that Cairo is more than 100 times more polluted than New York City.

UNITED NATIONS & IMO

Global Technical Regulation on Non-Road Emissions published

Global Technical Regulation (gtr) No. 11, 'Engine emissions from agricultural and forestry tractors and from non-road mobile machinery' has now been published. The gtr itself is accompanied by two appendices. One is the normal documentation on the development of the gtr, the second is a guidance document combining the legal text with advice from experts to explain and clarify some procedures.

The gtr is applicable to the determination of gaseous and particulate mass exhaust emissions from compression ignition engines of ≥ 19 kW and ≤ 560 kW to be used in non-road mobile machinery and tractors.

The gtr includes the Non-Road Transient test Cycle (NRTC) with both cold and hot starts and a soak time between the two of 20 ± 1 minutes. The weighting for calculating the NRTC emissions is 10% cold start,

90% hot start. The steady-state cycles are the ISO 8178 C1 8-mode cycle or a ramped version of it for variable speed engines and the D2 5-mode cycle or its ramped variant for constant-speed engines.

Test requirements for both periodically and continuously regenerating aftertreatment systems are incorporated. In the case of infrequent (periodic) regeneration, emissions are measured on at least 3 NRTC hot start tests or ramped modal cycle (RMC) tests, one during and two outside a regeneration event. The regeneration process must occur at least once during the NRTC or RMC test. The regeneration adjustment factor k_r , expressing the average emission rate, may also be a multiplicative or additive factor. The k_r factor is applied to the results of the weighted NRTC test and discrete mode cycle and may be applied to the ramped modal cycles and cold NRTC, if a regeneration occurs during the cycle.

Both full-flow and partial-flow dilution systems are included in the procedures. The PM sampling filter specifications allow use of either PTFE-coated glass fibre or PTFE membranes, both of 47 mm diameter.

No crankcase emissions are allowed to be discharged directly into the atmosphere, except that for engines equipped with turbochargers, pumps, blowers, or superchargers, crankcase emissions can be added to the exhaust emissions (either physically or mathematically) during all emission testing.

Copies of all the gtrs are on the UN-ECE website at www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29registry/gtr11.html.

IMO adopts Proposal for Emission Control Area round North America

The International Maritime Organization (IMO) announced on 26 March 2010 that it has accepted the proposal to designate waters off the North-American coasts as an Emission Control Area (ECA).

Enforcing the ECA standards will ultimately reduce the sulfur content of fuel by 98%, particulate matter emissions by 85% and NO_x emissions by 80%. The maximum fuel sulfur content will be reduced to 10 000 ppm in 2012 and to 1 000 ppm in 2015. New ships must use advanced emission control technologies to reduce NO_x emissions, beginning in 2016.

The ECA extends up to 200 Nautical Miles from the coast of the United States, Canada and French territories. This is the first ECA adopted under amendments to an IMO treaty in 2008 that strengthened and expanded both the ECA emissions standards and the approval criteria. The US EPA is also examining whether Puerto Rico and the US Virgin Islands should also be designated ECAs and will in future consider smaller Hawaiian Islands.

IMO to set up Expert Group on Shipping Greenhouse Gas Emissions

The International Maritime Organisation's Marine Environment Protection Committee (MEPC) meeting in London from 22-26 March 2010, agreed to set up an expert group to assess the feasibility of market-based measures for reducing ship's greenhouse gas emissions. The group will make recommendations at the next meeting of the MEPC in September 2010. Another working group has prepared draft texts on an energy efficiency index and management plans.

At the MEPC meeting, Germany requested an impact assessment for an emissions trading scheme with particular emphasis on developing countries. In March, Dutch consultancy CE Delft released a report stating that an international cap-and-trade scheme for the shipping sector is feasible and would provide environmental certainty over CO₂ emission reductions.

GENERAL

New PM Sensor

Pegasor Ltd. of Tampere, Finland, has introduced a new, compact, continuously operating and real-time particulate matter (PM) sensor, the PPS-M.

The company says the sensor can be installed in the engine exhaust without the need for complex sampling and dilution systems. Potential areas of application include engine test bench monitoring, on-board vehicle monitoring, vehicle inspection, on-board diagnostics, and measurements upstream and downstream of diesel particulate filters.

The PPS-M operates by electrostatically charging particles passing through the sensor and then measuring the current caused by the charged particles leaving the sensor. The sensor reports data on both particle mass and particle number concentrations in real time, at up to 100 Hz.

New Website for Swiss VERT Association

The Swiss association VERT recently launched a new website www.vert-certification.eu that will eventually replace the www.akpf.org website.

The new VERT website provides information on health, air quality and global warming, and provides some details about the VERT certificate. A list of VERT-certified particulate filters is also available.

Cummins confirms 5% Fuel Saving after Field-Tests with Stage IIIB Machines

Achieving a cumulative 20 000 hours of testing with equipment operators, Cummins says that initial results of its Tier 4 interim / Stage IIIB field-test programme

have confirmed up to a 5% higher fuel efficiency over Tier 3-powered commercial equipment.

The programme entailed the replacement of Cummins Tier 3 engines with Tier 4 engines of equivalent power, using a self-regenerating particulate filter, a new direct flow air cleaner, a variable geometry turbocharger and enhanced fuel systems.

Cummins said that "the field-test machines proved that most off-highway equipment operates at a high enough engine load factor for the DPF to self-regenerate almost every time in passive mode." Active regeneration typically occurred less than 1% of operating time, with the machine continuing to operate as normal during the regeneration, said Cummins, adding that the fuel consumed to activate the self-regeneration process was barely measurable.

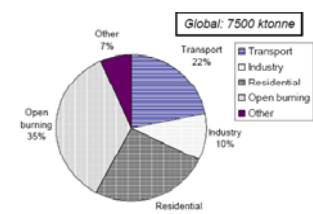
US Congressional Testimony on Black Carbon

Speaking at a US Congressional hearing of the Select Committee on Energy Independence and Global Warming on 16 March 2010, the Clean Air Task Force Advocacy Director, Conrad Schneider, said that "not only must we take action to reduce global greenhouse gas emissions significantly by mid-century, we must quickly reduce several short-lived pollutants, such as black carbon, which can have an immediate impact and slow the rate of warming. Black carbon is an important component of airborne particulate matter, and not only represents a potent climate-forcing agent, but also is a deadly air pollutant."

Mr. Schneider continued that "For diesel engines, filters that are available today can trap up to 90% of the black carbon emissions....For diesels, the needed policies boil down to mandates and money. The US and European Union have adopted emissions standards for new engines that, in essence, require filters on all new engines and that eventually will reduce particulate matter (and black carbon) emissions by 90%.

Michael Walsh, board chair of the International Council on Clean Transportation (ICCT), estimates that adoption of these standards in China, India, and Brazil with lesser standards elsewhere could deliver between 1 and 1½ Socolow climate stabilization wedges (*note*: 8 steps or 'Socolow wedges' have been proposed as being needed to stabilise climate-change emissions). However, because diesels are so durable, it will take decades before the fleet turns over completely to these new, cleaner engines. In the meantime, the focus must be on retrofitting existing engines and accelerating fleet turnover."

Prof. Tami Bond of the University of Illinois also presented testimony on Black Carbon at the hearing, including a slide showing the contribution of transport



(picture). Of the sources discussed, Prof. Bond said, diesel engines are the richest in warming black carbon pollutants.

Prof. V. Ramanathan (University of California,

San Diego) also said that “diesel and cooking stoves are prime targets for mitigation: Black Carbon generated by diesel combustion has greater warming potential than bio-fuel cooking or biomass burning. This is because diesel generates less of the cooling organic aerosols”.

Details of testimonies at the hearing are available at <http://globalwarming.house.gov/pubs?id=0016>.

Particulate Filter for Sea-Going Ships

Mitsui O.S.K. Lines (MOL) has announced the joint development with Akasaka Diesels of a particulate filter for vessels using marine heavy fuel oil.

Mitsui’s statement says that tests showed that the device removed more than 80% of particulate matter from diesel emissions. In the test, a diesel particulate filter (DPF) was installed on the main engine of an MOL group-operated coastal ferry. The vessel has a 9 267 kW main engine. Mitsui says this test marked the first successful use of a self-regenerating DPF on a large vessel using marine heavy fuel oil.

The company’s statement says that the DPF includes filters made of silicon carbide ceramic fibres. An internal heating system automatically burns off accumulated PM, eliminating the necessity for cleaning by seafarers and allowing the filter to be used continuously. Following the success of the experiment, MOL and Akasaka Diesels will further upgrade the DPF to ready the device for practical installation on diesel main engines and auxiliary engines of large-scale ocean-going vessels.

Intel Sensor to measure Air Quality

Intel Labs has developed a new technology to measure air quality. Intel’s device has sensors that measure nitrogen dioxide, carbon monoxide, and ozone. The new Common Sense air-quality sensor has GPS and GSM connections, so it can link the results to a specific place. Once the data have been uploaded to a server, the results can be combined to provide an indication of air quality in a whole region. The device is about the same size as a telephone. The director of Intel Labs says that in future this functionality could be integrated into a smartphone. These already have the necessary connections, so only the sensors would need to be integrated.

ICCT releases Report on Congestion Charging

A new paper from the International Council on Clean Transportation (ICCT) presents a brief overview of several congestion charging systems in use, reviews the benefits and challenges of the strategy and presents best practice recommendations for policy makers and planners globally who are considering congestion charging. It considers congestion charging experiences in London, Singapore and Stockholm, as well as a Hong Kong pilot programme.

The report observes that congestion reductions of 13 to 30%, greenhouse gas reductions of 15 to 20% and significant reductions of ozone and fine particulate pollution have been achieved from implementing congestion charging systems in London, Singapore and Stockholm. Upfront investments in public transit may be necessary to absorb increased ridership and to provide affordable mobility for low-income populations but the net revenue generated by congestion charging can be used for transit enhancements and other benefits.

The report is available at: www.theicct.org/information/reports/congestion_charging_paper

RESEARCH SUMMARY Health Effects of Emissions

Links between Air Pollution and Respiratory Health

This paper compares two estimation approaches to examine variations in urban air pollution levels and respiratory health problems. In the most general specifications they find the observed health effects of air pollution are very small and insignificant, with signs that are typically opposite to conventional expectations, whereas smoking effects are robust across specifications.

Source: Koop, McKittrick and Tole, Air pollution, economic activity and respiratory illness: Evidence from Canadian cities, 1974–1994; *Environmental Modelling & Software*, [doi:10.1016/j.envsoft.2010.01.010](https://doi.org/10.1016/j.envsoft.2010.01.010).

Ozone and Traffic Pollution increase Asthma-Related Hospitalisations in Children

Both ozone and primary pollutants from traffic substantially increase asthma-related emergency department visits in children, especially during the warm season, according to researchers in the US.

Ozone was strongly associated with an increase in paediatric asthma exacerbations during the summer, and there was evidence of a dose-response relationship beginning with concentrations as low as 30 parts per billion. Several markers of pollution from combustion engines were also associated with paediatric emergency department visits for asthma exacerbations during the warm season. When they

analysed the effects of multiple pollutants together, the researchers found evidence that ozone and primary pollutants from traffic sources independently affected paediatric asthma exacerbations.

Source: Strickland et al, Short-term Associations between Ambient Air Pollutants and Pediatric Asthma Emergency Department Visit; *American Journal of Respiratory and Critical Care Medicine*; doi:[10.1164/rccm.200908-1201OC](https://doi.org/10.1164/rccm.200908-1201OC).

Exposure-Response Relationships for Primary PM_{2.5}

A new paper from Finland says that variations in emission-exposure and exposure-response (toxicity) relationships for different emission source categories of anthropogenic primary fine particulate matter (PM_{2.5}) have a potentially crucial importance when determining cost-effective abatement strategies.

Source: Tainio et al, Uncertainty in health risks due to anthropogenic primary fine particulate matter from different source types in Finland; *Atmospheric Environment*, doi:[10.1016/j.atmosenv.2010.02.036](https://doi.org/10.1016/j.atmosenv.2010.02.036).

Global Mortality due to Ozone and Fine Particles

This paper estimates the global burden of mortality due to O₃ and PM_{2.5} from anthropogenic emissions using global atmospheric chemical transport model simulations of pre-industrial and present day (2000) concentrations to derive exposure estimates.

Source: Anenberg SC et al., An Estimate of the Global Burden of Anthropogenic Ozone and Fine Particulate Matter on Premature Human Mortality using Atmospheric Modelling. *Environmental Health Perspectives*, doi:[10.1289/ehp.0901220](https://doi.org/10.1289/ehp.0901220).

Effects of Pollution on the Ocular Surface

A paper from Brazil explores the clinical relevance of chronic exposure to ambient levels of traffic derived air pollution on the ocular surface. There was a significant association between NO₂ quartiles and reported ocular irritation and a significant negative association between tear break-up time and NO₂ exposure. There was a significant increase in the frequency of meibomitis in subjects exposed to higher levels of NO₂.

Source: Novaes et al, The effects of chronic exposure to traffic derived air pollution on the ocular surface; *Environmental Research*, Vol.110 Iss.4 pp.372-374, doi:[10.1016/j.envres.2010.03.003](https://doi.org/10.1016/j.envres.2010.03.003).

Assessment of Exposure

Exposure to Two-stroke Scooter Exhaust

The aim of this study was to develop a system to expose a characterised triple cell co-culture model of the human epithelial airway barrier, to freshly produced and characterised total scooter exhaust emissions. The researchers conclude that the described exposure system can be used to evaluate the toxic potential of total exhaust emissions.

Source: Müller et al, New Exposure System to Evaluate the Toxicity of (Scooter) Exhaust Emissions in Lung Cells in Vitro, *Environ. Sci. Technol.*, Vol.44 No.7, pp.2632-2638, doi:[10.1021/es903146g](https://doi.org/10.1021/es903146g).

Exposure to Particulates whilst Cycling

A paper from researchers in Belgium quantifies the exposure of car passengers and cyclists to Particulate Matter, measured as Particle Number Concentration - PNC, PM_{2.5} and PM₁₀ plus ventilatory parameters such as breathing frequency and tidal volume. Concentrations and lung deposition of PNC and PM mass were compared between biking and car trips. The authors found that increased ventilation in cyclists significantly increases their exposure to traffic exhaust and comment that this aspect has been ignored or severely underestimated in previous studies.

Source: Panis et al, Exposure to particulate matter in traffic: a comparison of cyclists and car passengers; *Atmospheric Environment*, doi:[10.1016/j.atmosenv.2010.04.028](https://doi.org/10.1016/j.atmosenv.2010.04.028).

Air Quality

Satellite Data indicate Global PM_{2.5} Problem

A research study estimating long-term global fine particulate matter (PM_{2.5}) concentrations using satellite data has found that 80% of the global population lives in areas exceeding WHO Air Quality Guideline (AQG) of 10 µg/m³ for PM_{2.5}.

Global estimates of long-term average (2001-2006) PM_{2.5} concentrations at ~10 km × 10 km resolution indicate a global population-weighted geometric mean PM_{2.5} concentration of 20 µg/m³. The World Health Organisation's Interim Target-1 for PM_{2.5} Air Quality (35 µg/m³ annual average) is exceeded over central and eastern Asia for 38% and 50% of the population, respectively. Annual mean PM_{2.5} concentrations exceed 80 µg/m³ over Eastern China.

Source: van Donkelaar et al, Global Estimates of Ambient Fine Particulate Matter Concentrations from Satellite-based Aerosol Optical Depth: Development and Application. *Environmental Health Perspectives*, doi: [10.1289/ehp.0901623](https://doi.org/10.1289/ehp.0901623).

Study on North Sea Ship Emissions

A new study investigates the impact of ship emissions in coastal areas of the North Sea. It was found that northern Germany and Denmark in summer suffer from more than 50% higher sulfate, nitrate and ammonium aerosol concentrations due to contributions from ships. The implementation of a sulfur emission control area (SECA) in the North Sea at the end of 2007 directly results in reduced sulfur dioxide and sulfate aerosol concentrations while nitrate aerosol concentrations are slightly increased.

Source: Matthias, Bewersdorff, Aulinger and Quante, The contribution of ship emissions to air pollution in the North Sea regions, *Environmental Pollution*, doi: [10.1016/j.envpol.2010.02.013](https://doi.org/10.1016/j.envpol.2010.02.013).

External Costs of Emissions from Shipping

The University of Piraeus, Greece, has attempted to produce a ship exhaust emissions inventory for Greece and to assess the resulting external costs. The internalisation of external costs for domestic

shipping was found to produce an increase of €12.96 per passenger and €2.71 per transported ton.

Source: Ernestos Tzannatos, Ship emissions and their externalities for Greece; *Atmospheric Environment*, doi:10.1016/j.atmosenv.2010.03.018.

Characterisation of Particulate

Nanoparticles from Organometallic Fuel Additives

This paper presents the results of particle size measurements performed on the exhaust of a car operating on a chassis dynamometer and fuelled with standard gasoline and gasoline containing low levels of Pb, Fe, and Mn organometallic additives. The authors found that when additives were present there was a distinct nucleation mode consisting primarily of sub-10 nm particles. Most of these solid nanoparticles fall below the 23 nm cut-off of the PMP regulation.

Source: Gidney, Twigg and Kittelson, Effect of organometallic fuel additives on nanoparticle emissions from a gasoline passenger car; *Environmental Science and Technology* Vol.44 Iss.7 pp.2562-2569, doi: 10.1021/es901868c.

Particle Emission Factors for Modelling

A new study from Queensland University, Australia, compiles a set of tailpipe particle emission factors for different vehicle and road type combinations, covering the full size range of particles emitted (particle number, particle volume, PM₁, PM_{2.5} and PM₁₀), and which are suitable for modelling urban fleet emissions.

Source: Keogh et al, Derivation of motor vehicle tailpipe particle emission factors suitable for modelling urban fleet emissions and air quality assessments; *Environmental Science and Pollution Research International*, Vol.17 No.3 pp.724-39.

Engine Development and Emissions Measurement

Effect of Ethanol Blends on a Small Engine Generator

The results of a study from Taipei University suggested that particle number concentration increased as the engine loading increased; however, it decreased as the ethanol content in a gasoline-ethanol blend increased from 0 (E0) to 9% (E9). The E6 fuel gave the best results for gaseous emissions and the E9 fuel gave the best results for particle emissions and engine performance.

Source: Lin et al, Effect of Ethanol-Gasoline Blends on Small Engine Generator Energy Efficiency and Exhaust Emission; *Journal of the Air & Waste Management Association*, Vol.60 No.2 pp.142-148, <http://secure.awma.org/journal/Abstract.aspx?id=2193>.

Effects of Fuel Sulfur and DOC on Particles

This paper investigates the effects of fuel sulfur content and Diesel Oxidation Catalyst on number-size distribution, sulfate and trace metals of particulate matter emitted by a Euro 3 light-duty diesel engine. The results revealed that the presence of the catalyst and variations in fuel sulfur altered the extent to which

hydrocarbons and sulfates condense on soot particles.

Source: Zhao, et al., Effects of fuel sulfur content and diesel oxidation catalyst on PM emitted from light-duty diesel engine, *Energy & Fuels*, doi: 10.1021/ef900982c.

Effect of Non-Edible Oils on Emissions

This article presents the results of tests using three non-edible oils at three different fuel injection temperatures in a small compression ignition engine with EGR. The authors say the results show that oils at preheated temperatures can be a good substitute for conventional diesel fuel with a much smaller decrement in power and thermal efficiency in the case of engines without turbo charging.

Source: Yadav and Singh, A comparative evaluation of compression ignition engine performance using preheated jatropha, karanja, and neem oils. *Proc. IMechE, Part A: J. Power and Energy*, Vol.224 No.1, pp.47-57. doi: 10.1243/09576509JPE770.

Interactions of Emissions

Radiative Forcing of Fine Particles

Airborne fine particles produced by road transport trap more radiation in the earth's atmosphere than previously estimated, and therefore may contribute more than previously thought to global warming, according to new research. In contrast, the impact of particles from shipping appears to reflect more radiation than previously thought.

Source: Balkanski et al, Direct radiative effect of aerosols emitted by transport: from road, shipping and aviation. *Atmospheric Chemistry and Physics Discussions*. Vol. 10, Iss.1 pp.1659-1691, www.atmos-chem-phys-discuss.net/10/1659/2010/acpd-10-1659-2010.html.

Evaluation of the Gothenburg Protocol

Recent research indicates that, although the air pollution ceilings in the UN Gothenburg Protocol to abate acidification, eutrophication and ground-level ozone have been effective, they could benefit from more flexibility to allow for uncertainty in modelling future energy use, technologies and growth.

Source: Kelly et al, Setting national emission ceilings for air pollutants: policy lessons on ex-post evaluation of the Gothenburg Protocol. *Environmental Science & Policy* Vol.13 pp.28-41, doi:10.1016/j.envsci.2009.09.003.

Co-benefits for Air Quality and Climate Policies

A new study presents an analysis of the barriers and opportunities for incorporating air quality co-benefits into climate policy assessments. The assessment finds that full inclusion of co-benefits depends on better valuation of climate damages.

Source: Nemet, Holloway, and Meier, Implications of incorporating air-quality co-benefits into climate change policymaking. *Environmental Research Letters* Vol.5 No.1, 014007 (9pp) doi:10.1088/1748-9326/5/1/014007.

FORTHCOMING CONFERENCES

Leapfrogging Opportunities for Air Quality Improvement

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

Details at www.dri.edu/leapfrogging-opportunities-for-air-quality-improvement

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

Diesel Particulates and NOx Emissions Short Course

17-21 May 2010, Leeds, UK

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

18th International Symposium on Transport and Air Pollution

18-19 May 2010, Dübendorf, Switzerland

Details at www.empa.ch/plugin/template/empa/*//86139/---/l=2

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

3rd Annual China Green Transport Summit

19-20 May 2010, Beijing, China

Details at www.china-gts.com

The conference will focus on emissions reduction technology for cars, buses and trucks. Officials from China's Ministries of Industry and Information Technology; Science and Technology; and Environmental Protection will attend, together with professionals from well-known research institutes.

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

26-27 May 2010, Rouen, France

Details at www.sia.fr/evenement_detail_motorisations_diesel_face_au_1044.htm

The diesel engine is considered as one of the future methods for low CO₂ emissions, but the price of reducing pollutant emissions is one of growing complexity. New approaches will be necessary to continue development of these engines.

33rd FISITA World Automotive Congress

30 May - 4 June 2010, Budapest, Hungary

Details at www.fisita2010.com

Top experts from the automotive community around the world will review the latest technical

breakthroughs and innovations and show the world that our future mobility depends on engineers.

CITEAIR II Air Quality Workshop and Networking Workshop:

1-2 June 2010, Ljubljana,

The conference is intended to address the questions of how can cities efficiently inform the public about air quality; how PM_{2.5} should be taken into account; how air quality can be linked to climate change; and "what about integrating green house gases in air pollutant emission inventories?"

9th International Symposium on Combustion Diagnostics

8-9 June 2010, Baden-Baden, Germany

Details at www.combustion-diagnostics.com

Developers make use of a combination of sophisticated tools from simulation, and from indicating and visual instrumentation. These are not limited to the combustion chamber, but also require verification along the entire gas exchange, fuel mixture generation and exhaust aftertreatment path.

Metrology of Airborne Nanoparticles, Standardisation and Applications (MANSA)

8-9 June 2010, Teddington, UK

Details at www.npl.co.uk/events/mansa

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

5th Emission Control 2010

10-11 June 2010, Dresden, Germany

Details at <http://141.30.185.60/index3.php?SECTION=EC2010&LNG=en>

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

Off Highway Vehicles

14-16 June 2010, Berlin, Germany

Details at www.off-highway-vehicles.com/Event.aspx?id=279994

High-level speakers from companies such as Volvo, John Deere, Caterpillar, FEV Motorentechnik, Hatz Diesel Motorbau, Liebherr, Heinzmann and many more will report about their latest projects and strategies in the fields of new powertrain and engine concepts, enhanced aftertreatment for lower emissions and efficient retrofitting.

CIMAC (International Council on Combustion Engines) Congress 2010

14-17 June 2010, Bergen, Norway

Details at www.cimac.com

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

6th Diesel Emissions Conference & AdBlue Forum Europe 2010

15-17 June 2010, Frankfurt, Germany

Details will be at www.integer-research.com

Engine Emissions Measurement Short Course

21-25 June 2010, Leeds, UK

Details at

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

Passenger car emissions measurements are fully detailed for ultra-low emission SI and diesel vehicles. Heavy-duty diesel emissions legislation measurement methods for on-road and off-road engine uses are fully described, including the latest European proposals for measurement of particle number.

Automotive News Europe Congress

22-23 June 2010, Bilbao, Spain

Details at

www.autonews.com/Assets/html/10_anec/default.htm

The theme of this year's Congress is "Solutions After a Crisis: Navigating Out of a European Downturn." Industry is facing challenges and opportunities that are greater than ever. The conference will address the issues of vehicle emissions, now at the top of the industry's agenda, and capacity adjustments.

Engine Expo 2010

22-24 June 2010, Stuttgart, Germany

Details at www.engine-expo.com

Throughout the Expo an Open Technology Forum will take place. Topics will include engine developments, "what's next for catalytic converter technology", SCR vs. EGR and hybrid technology.

3rd International MinNOx (Minimising NOx emissions through exhaust aftertreatment)

29-30 June 2010, Berlin, Germany

Details at www.iav.com/

us/4_events/iav_conferences.php?we_objectID=16007

Papers will cover emissions control and EGR systems, diagnostics, combustion processes, system integration, fuel and environmental impacts, and practical experience with use in mass production.

Emission Control

30 June - 1 July 2010, London, UK

Details at [www.acius.net/wiki.aspx/](http://www.acius.net/wiki.aspx/Conferences/Upcoming?view=overview&id=173)

[Conferences/Upcoming?view=overview&id=173](http://www.acius.net/wiki.aspx/Conferences/Upcoming?view=overview&id=173)

This event will reveal real solutions towards minimising emissions for the shipping industry through technical, operational and market-based measures. Industry leaders will share their experiences, case-studies and real solutions towards ensuring efficient emissions control. The event will also look at the long term implications of market-based initiatives on CO₂.

Busworld Russia

30 June - 2 July 2010, Nizhny Novogorod, Russia

Details at www.busworldrussia.ru

SCR Systems

5-8 July 2010. Stuttgart, Germany

Details at www.car-training-institute.com/scr

The first day is an introductory seminar 'Basics on SCR systems and the final day is a special day on 'emission-related sensors'. The main forum covers legislation, applications (light-duty diesel and lean petrol, heavy-duty and non-road) and experience of SCR, material innovations, NH₃ storage and dosing.

14th ETH Conference on Combustion Generated Nanoparticles

1-4 August 2010, Zürich, Switzerland

Details at www.lav.ethz.ch/nanoparticle_conf

The conference provides an interdisciplinary forum for experts in various fields to discuss new scientific findings on combustion-generated nanoparticles, methods to characterize such particles for research, type-approval, diagnostics, manufacturing control, and in-use compliance testing. In addition, the progress of internal and external emissions control of internal combustion engines and other combustion technologies, as well as health effects due to combustion-generated nanoparticles and their effects on climate will be discussed.

Deadline for abstracts: 20 May 2010.

VPPC 2010: Vehicle Power and Propulsion Conference

1-3 September 2010, Lille, France

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

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

Diesel Emissions Conference India 2010

8-9 September 2010, New Delhi, India

Details at

www.integer-research.com/conferences/dec-india

Sessions are to include global emissions control technology trends and the application in India market; vehicular emissions reduction policy and the Government's plans for air quality improvement in India; innovative SCR technologies to meet tighter future emissions target in Europe & India; the application of EGR technology for commercial vehicles in India; and further emissions reduction for diesel commercial vehicles and passenger cars.

Details will be at www.integer-research.com

22nd International AVL Conference 'Engine & Environment':

9-10 September 2010, Graz, Austria

Details at www.avl.com

This year's topic is "The Innovative Internal Combustion Engine in the Context of Powertrain Electrification – A Major Key to Long-Term CO₂ Reduction?"

Heavy Duty Diesel Emissions Control Symposium

21-22 September 2010, Gothenburg, Sweden

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

The impact of diesel emissions control affects OEMs and suppliers alike. This technology-focused event will draw leading experts from the global heavy-duty diesel powertrain industry to discuss the pathways to emissions compliance and the solutions that are under investigation. Discussions will include: Euro 6 Light-duty regulation, new Diesel hybrid and clean Diesel technologies, CARB HD OBD 2013 regulation, engine & systems development, aftertreatment, emerging technologies, emissions control strategies, improved fuel economy, and global harmonization of emissions standards.

16th DEER (Directions in Engine-Efficiency and Emissions Research) Conference

27-30 September 2010, Detroit, Michigan, USA

Details at www.orau.gov/deer2010

The conference is sponsored by the US Department of Energy's (DOE) Office of Vehicle Technologies and is DOE's primary mechanism for the public exchange of state-of-the-art combustion engine research and development. DOE will showcase its cooperatively funded R&D with its partners, national laboratories, the passenger and commercial transportation industry, universities and other national and international organisations.

23rd World LP Gas Forum

28 September - 1 October 2010, Madrid, Spain

Details at www.wlpgasforum-aegpl2010.com

IFZ 8th International Motorcycle Conference

4-5 October 2010, Cologne, Germany

Details at www.ifz.de/e-events-conferences-8intmotorcycle.htm

The theme of the conference will be 'Safety – Environment – Future'. Environmental aspects will include motorcycle emissions and standards and measurement procedures. The conference will take place prior to the 7th International Motorcycle and Scooter exhibition INTERMOT Köln 2010.

19th Aachen Colloquium "Automobile and Engine Technology"

4-6 October 2010, Aachen, Germany

Details at www.aachener-kolloquium.de/index_e.htm

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

SAE 2010 Commercial Vehicle Engineering Congress and Exhibition

5-6 October 2010, Rosemont, Illinois, USA

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

13th Annual Central and Eastern European Refining and Petrochemicals Roundtable

12-14 October 2010, Budapest, Hungary

It is planned to include case studies on meeting EU fuel specifications, blending first and second generation biofuels, biofuels production from municipal solid waste, and market trends.

ICAT'10 – International Conference on Energy and Automotive Technologies

5 November 2010, Istanbul, Turkey

The main theme of this conference will be "Fossil Fuels: Today and Tomorrow". In addition to specific fuel issues, topics include vehicles of the future; diesel and gasoline engine development, durability and emissions; alternative drivetrains; and scenarios for the green future.

Deadline for papers: 15 June 2010

MTZ-Konferenz – Heavy-Duty, On- und Off-Highway-Motoren, Euro 6 / Tier IV – und was kommt danach?

23-24 November 2010, Mannheim, Germany

Details at www.atzlive.de/pdf/cfp_heavy_duty_2010.pdf

The conference will cover new engines, emissions, aftertreatment, fuel injection, supercharging and cooling, combustion process, fuels, lubricants and friction and alternative propulsion.

Deadline for abstracts: 10 May 2010