



Newsletter

May-June 2008

INTERNATIONAL REGULATORY DEVELOPMENTS

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EUROPE

EU Environment Council accepts Euro 5 and Euro 6 Implementing Measures

The EU's Environment Council meeting held on 5 June 2008 accepted the proposed Regulation and Directive implementing Euro 5 and Euro 6 for light-duty vehicles. The 'political' Regulation, containing limit values, durability requirements etc., has already been published as (EC) 715/2007. The proposed implementing Regulation contains all the technical detail needed to apply Euro 5 & 6 and the Directive makes necessary modifications to the existing heavy-duty engine emissions Directive.

The Council represents the Member States in the EU. The documents have still to go through the 'scrutiny' procedure which allows the European Parliament to review the content. The Council decision implies that, unless the Parliament opposes them, the Commission may adopt the proposed legal acts. Publication is expected in July.

European Economic Area adopts Euro 5 and Euro 6 Regulation

The agreement between the EU and the European Economic Area (EEA) has been amended to include EU Regulation (EC) 715/2007 – the published part of Euro 5 and Euro 6. The agreement extends the operation of the regulation to Iceland, Liechtenstein and Norway and the text will now be published in Icelandic and Norwegian languages in the EEA Supplement to the EU's Official Journal.

EU Air Quality Directive published

The revised EU Directive on Ambient Air Quality and Cleaner Air for Europe has been published as Directive 2008/50/EC. Member States must now transpose the Directive into national law by 11 June 2010. The Commission has also to finalise the implementing measures by amending some annexes to the Directive, but these amendments cannot affect limit values, targets or thresholds, or dates.

The new Directive sets requirements for the assessment of air quality in Member States with regard to NO₂ and NO_x, PM₁₀ and PM_{2.5}, ozone, benzene, lead, CO and SO₂. It defines that Member States must "take all necessary measures not entailing disproportionate costs" to reduce exposure to meet the air quality target values and long-term objectives, but allows Member States to postpone the deadlines for NO₂, benzene or PM₁₀ in a particular area for a maximum of 5 years providing they

establish an air quality plan supported by information to show how they will ensure conformity.

The Directive sets limit and target values including an 8-hour mean of 120µg/m³ for ozone by 1/1/2010; a 1-hour limit of 200µg/m³ for NO₂ and an annual limit of 40µg/m³ by 1/1/2010; confirmation of the existing PM₁₀ daily limit of 50µg/m³ not to be exceeded more than 35 times per year and annual limit of 40µg/m³; and a new PM_{2.5} annual target value of 25µg/m³ by 1/1/2010, to become a limit value from 1/1/2015 (subject to review in 2013) with an indicative target of 20µg/m³ from 1/1/2020.

European Summer 2007 Ozone Levels lowest in a Decade

High concentrations of ozone in Europe were lower during the summer of 2007 than any other year in the past decade, according to the latest data unveiled by the European Environment Agency. The highest one-hour ozone concentration of 479µg/m³ was observed in Sicily. France, Greece, Italy and Romania also reported high hourly ozone concentrations at least six times last summer. A high proportion of exceedances were observed during a single episode from 14-21 July 2007. The report is available at reports.eea.europa.eu/technical_report_2008_5/en.

EU to propose Green Road Tolling Rules

The European Commission is proposing to revise the "Eurovignette" road charging rules for heavy goods vehicles to encourage Member States to take greater account of transport's environmental costs. Under the new proposal, charges would cover pollution and congestion costs and vary by road type, vehicle emission class and driving time. National authorities would set the overall charge according to formulas specified in the proposal. Member States would have until 2010 to implement the rules. The Commission foresees a first review in 2013, when it will also assess whether the charges should be mandatory.

European Parliament urges Action on Maritime Pollution

In a resolution adopted on the first European Maritime Day, the European Parliament has called for closer cooperation with the International Maritime Organisation (IMO), particularly on the introduction of nitrogen oxide emission standards for ships using EU ports; the quality and sulfur content of marine fuels; the designation of the Mediterranean Sea, Black Sea and the North-East Atlantic as Sulfur Emission Control Areas (SECAs); and fiscal measures, such as differentiated harbour and waterway charges to favour ships with low SO₂ and NO_x emissions.

High Potential to cut Air Pollution from Europe's Power Plants

A report from the European Environment Agency says that improving the environmental performance of Large Combustion Plants (LCPs) by applying the best available techniques could have reduced NO_x emissions by up to 59% and SO₂ by as much as 80% in 2004. The report, 'Air Pollution from Electricity-Generating Large Combustion Plants' is based on data from 450 electricity-generating LCPs that account for more than 70% of the NO_x and SO₂ emissions from this sector. Large combustion facilities are responsible for 54% and 18% of reported SO₂ and NO_x emissions respectively in the EU. The report is at reports.eea.europa.eu/technical_report_2008_4/en.

Health Benefits of reducing Power Plant Emissions

A statement from the European Environmental Bureau and the Swedish NGO secretariat on acid rain says that reducing emissions of SO₂ and NO_x from Europe's largest power plants would deliver "very significant" health benefits. The comments came alongside a new study showing that the health gains generated by achieving the pollution cuts are three times higher than the costs of reducing emissions. It also shows that applying best available techniques (BAT) to Europe's dirtiest plants would dramatically reduce pollution. The study was released ahead of discussions due in the European Parliament's Environment Committee on plans to revise the 1996 Integrated Pollution Prevention and Control (IPPC) Directive. It reflects the findings of an earlier European Environment Agency report issued in May.

Greece plans Low Emissions Zones, Incentives and Revised Vehicle Taxes

The Environment Minister of Greece has presented a 'National Plan for Combating Air Pollution', outlining a series of measures providing financial and other incentives, as well as the introduction of "green zones" with restricted access to vehicles.

The measures include financial incentives for withdrawing non-catalyst vehicles, changes to road taxes to incorporate environmental criteria, and allowing local authorities to impose tolls for entry into city centres. The incentives will be decided by the Finance Ministry based on the country's financial capacity, while the rest of the measures could begin to be implemented between 2009 and 2010 after consultation with the various bodies involved. The new road tax system would have four 'classes' based on the amount of emissions produced, so that

vehicles with no or low emissions will not have to pay road tax. The next three categories (medium, high and very high emissions vehicles) will pay increasing amounts and receive colour-coded tax disks to display on their vehicles. They will be required to produce their exhaust emissions control cards during regular police checks. The 'Green zone' measure will allow local authorities to prevent certain of these categories of vehicles from entering their central areas.

Glasgow plans Low Emissions Zones, Retrofits, Idling Restrictions

Glasgow, Scotland's largest city, is to publish a draft plan to improve air quality in the city. It could see Low Emissions Zones (LEZ) introduced to parts of the city centre. Proposals will also be considered to tackle vehicles idling by the roadside and to reduce emissions from taxis and private hire cars by bringing them up to at least Euro 3 standards by 2010. The proposals include reducing emissions from the Council's own vehicle fleet by using vehicles with Euro IV or Euro V engines. Following discussion by Glasgow City Council the proposals will go out to public consultation.

Germany boosts Clean Truck Subsidies

Germany's Transport Ministry (BMVBS) has announced further subsidies to encourage a shift to the use of cleaner vehicles in the heavy goods transport sector. A support fund of €100m launched last year has been topped up with a further €85m. Vehicle buyers can choose between cheaper loans or direct grants of up to €4250 per truck. Vehicles must meet the EU's Euro V or EEV Class 1 emissions standards. So far some 25 000 grants have been given for the purchase of new vehicles. The government says it intends to promote vehicles meeting Euro VI as soon as the requirements are agreed at EU level and become German law.

Belgian Deputy Secretary of State proposes Euro 5 Incentives

The Belgian Deputy Secretary of State for Finance, has said that he wishes to set up a Commission on "green taxes" to rethink taxation involving the Belgian regions. He wants to further encourage those who opt for less polluting vehicles. He hopes to quickly give a tax advantage for the purchasers of Euro 5 cars and will require the installation of a particulate filter on all new models of diesel cars. An online survey of 1200 motorists conducted by the Belgian automobile club VAB showed that nine out of ten Belgian motorists want each new diesel car to be equipped with a filter.

Commission approves Czech Aid for Inland Waterway Emissions

The European Commission has authorised a Czech state aid scheme to operators of inland waterway freight transport vessels. The aid has a total budget of CZK 443.5 million (€17.33 million) and will be co-financed from the European Regional Development Fund. The scheme includes aid for purchase of low-emissions engines, which will incentivise companies to upgrade to ships to the latest EU standards.

Montenegro to launch Green Tax for Foreign Vehicles

Montenegro will launch a new 'green tax' this summer for all foreign cars, buses and trucks entering the Adriatic state. The tax, which will start on 15 June 2008, will be €10 for cars and mini-buses and between €30 and €150 for trucks, buses and other larger vehicles depending on their size and power. Drivers can pay at the border and will get a sticker for their cars as proof of payment, valid for one year. Montenegrins already pay an annual eco-tax of €5 for their cars, which will be now raised. The government foresees total revenue of €20 million, with which it plans to improve environmental protection.

NORTH AMERICA

Canada to regulate Locomotive Emissions from 2011

Delegates at the 2008 Rail Conference held in Toronto on 6-7 May 2008 were told by Transport Canada that locomotive emissions regulations will be introduced from 2011. The pollutant emission requirements are expected to be harmonised with those of the US Environmental Protection Agency, but the Canadian regulations will also control greenhouse gas (GHG) emissions. The 2011 regulation will be a part of the Transport Canada's Railway Safety Act.

California proposes amendments to SI Marine Engine and Boat Regulations

The California Air Resources Board (CARB) has issued proposals for amendments to the California regulations and test procedures for new spark-ignition marine engines and boats and to the related regulations on in-use compliance and for add-on and modified parts. The amendments are intended to provide greater compliance flexibility to the industry, particularly to manufacturers of high performance sterndrive/inboard engines, and to enhance alignment with proposed US EPA regulations.

California Regulations for In-Use Diesel Trucks and Buses

The California Air Resources Board (CARB) has released an updated version of proposed regulations on emissions requirements for diesel trucks and buses, due to become effective in 2010. The latest proposal offers three compliance options: use of best available control technology (BACT), an option covering retrofit for particulate matter reduction combined with a fleet turnover requirement, and a fleet average emissions option. All three require PM reductions from 2010-2012 and some NOx reductions beginning in 2012. There are special provisions for low-use vehicles, very small fleets and school buses.

New California Requirements for Replacement Catalytic Converters

On 10 June 2008, California's Office of Administrative Law approved amendments to the regulations and test procedures governing replacement catalytic converters for California's vehicles. The requirements apply to all new aftermarket converters produced for sale or sold in California after 1 January 2009. Key requirements are that the replacement catalytic converters must enable the vehicle to meet the relevant emissions standard for 5 years or 50 000 miles (with a warranty) and be compatible with OBD II monitors where the vehicle has such a system. The requirements also mean that no used converter can be legally advertised for sale, sold, or installed in California after 10 July 2008.

Car Scrappage Incentives for Canada

The Canadian Government has announced a scheme whereby Canadians will be offered rebates on a new vehicle, public transit passes, bicycles, or cash if they agree to scrap pre-1996 vehicles. The government says tougher emissions standards were introduced in 1996 and the older vehicles produce about 19 times more pollutants than newer models. 5 million of Canada's 18 million cars and trucks were made before 1996. The 'National Vehicle Scrappage Programme' will start by January 2009.

Port of San Diego launches Clean Truck Programme

The Port of San Diego is launching a clean truck programme, in line with those at other major California ports. Truck owners who voluntarily participate in the retrofit or replacement programme will receive a range of subsidies funded by a combination of State grants and money provided by the Port.

US Federal Authorities agree Port Ban on Older Trucks

The US Federal Maritime Commission has announced it will allow port authorities in Los Angeles, California, to proceed with a ban on older diesel trucks from 1 October 2008. The ban will prohibit pre-1989 trucks from operating in the port. From 1 January 2012, only trucks meeting the 2007 emissions standards will be allowed. The commission agreed to grant the ports an exemption to federal anti-trust laws (designed to prevent price-fixing in the shipping industry) so they can work out implementation of the truck ban with marine terminal operators. Under the plans, the ports will use container fees, bond money, grants and Harbour Department revenues to heavily subsidise the replacement or retrofit of some 17 000 trucks hauling goods to and from the waterfront. The initiative is expected to cost \$2.4 billion up to 2012, but regulators estimate the initiative will cut diesel pollution from trucks by 80%.

Massachusetts plans School Bus Retrofit Programme

The Governor of the US State of Massachusetts has announced the launch of the first fully funded State-wide programme to reduce air pollution from school buses. All eligible diesel-powered school buses in the State (around 5 500 vehicles) will be retrofitted with emissions control devices by 2010 at no expense to bus owners. The retrofit devices will be installed using \$16.5 million in State and Federal funds.

Study on Light-duty Vehicle Particulate Emissions

The US Environmental Protection Agency has released a summary of a study on light-duty gasoline vehicle particulate matter (PM) conducted in Kansas City during 2004 and 2005. The data suggest that the current EPA inventory model significantly underestimates PM emissions from light-duty gasoline vehicles, especially in areas with colder winters.

The analysis shows that half of the PM emissions measured came from 13% of the vehicles that were tested. Light-duty trucks were found to have slightly higher PM emissions compared to cars. PM emission levels were lower for newer vehicles, but it is not clear whether this is due to changes in vehicle technology or ageing of vehicles. Emissions results were measured for some vehicles under a range of ambient temperature conditions. PM emissions were found to increase exponentially as ambient temperature decreases. Elemental carbon (EC) accounts for roughly 20% of the PM emitted from light-duty

vehicles, with the balance being organic carbon. EC emissions roughly double during engine starts compared to hot running operation. The report is at www.epa.gov/otaq/emission-factors-research/index.htm.

Pollution Costs California \$70 Billion and Thousands of Lives Each Year

Up to 24 000 deaths a year among Californians are linked to air pollution, according to a California Air Resources Board draft report on premature deaths associated with dangerous air particles. That is triple the previous estimate and may be reducing the life expectancy of residents by up to 10 years.

The process that produced the draft report began in 2006 when CARB staff was directed by the board to update the health impacts methodology to reflect recent health information on PM_{2.5} exposures and premature death. A formal review of the updated methodology and analysis was conducted by a peer review committee formed by the University of California and composed of experts in the fields of epidemiology, air quality measurement, risk management, health effects, and biostatistics.

The draft staff report is now available for public comment. Public input will be considered in drafting the final report, due for release in August.

Source: Hien T. Tran et al, Methodology for Estimating Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California; CARB 22 May 2008, www.arb.ca.gov/research/health/pm-mort/pm-mortdraft.pdf.

British Columbia Pushing For Tougher Vehicle Emissions Standards

The Canadian province of British Columbia has proposed legislation to adopt California's tailpipe emissions standards, including greenhouse gas emissions. The proposed legislation would require automobile manufacturers' fleets to meet average greenhouse gas emissions standards. The legislation would also give the provincial government the authority to require larger vehicle manufacturers to include in their fleets a percentage, or set number, of zero-emission vehicles each year.

US Senate Committee wants to Control Ship Pollution

The US Senate's Environment and Public Works Committee has voted to regulate emissions from large ocean-going vessels. The Marine Vessel Emissions Reduction Act of 2008 (S.1499) would require use of lower sulfur fuels in all ocean-going vessels calling at US ports. The same legislation has been introduced in the House of Representatives as HR 2548. As emissions from other engines have been regulated,

ships are becoming a major source of PM and NOx. EPA has been delaying their new regulations on emissions from large (Category 3) ship engines of over 30 litres per cylinder, in order to harmonise them with the requirements set by the International Maritime Organization (IMO), but the slow IMO process creates pressures to adopt unique US-based regulations.

California proposal on Low Sulfur Fuels for Ocean-going Ships

The California Air Resources Board (CARB) has proposed two regulations to reduce particulate matter, oxides of nitrogen (NOx), and sulfur oxides (SOx) by extending the use of low sulfur marine fuels in ocean-going ships. The proposal would require the use of low-sulfur distillate fuels in auxiliary diesel and diesel-electric engines, main propulsion diesel engines, and auxiliary boilers in ocean-going vessels operating within regulated California waters – essentially those within 24 nautical miles of the coast. From the implementation date, auxiliary engines would be required to use either marine fuel oil with a maximum sulfur content of 1.5% or marine diesel with a maximum sulfur content of 0.5%. Main engines and auxiliary boilers would have to use the same fuels from 1 July 2009. From 1 January 2012, fuel with 0.1% sulfur would be required for all these applications. Under limited circumstances, operators would be allowed to pay a fee instead of complying with these requirements. The fee would increase with each subsequent port visit.

US EPA's 2008 Report on the Environment

The US Environmental Protection Agency (EPA) has released its 2008 Report on the Environment. EPA says the report is an important resource that citizens can use to better understand trends in the condition of the air, water, and land and related changes in human health and the environment in the United States.

The report uses scientifically sound, quantifiable indicators to measure and report on overall progress toward protecting the environment and human health, says EPA. The purpose is to create a reliable set of information that can be used for year-to-year comparisons as well as planning. It is hoped that in the future, EPA will be able to look at the trends of the environmental indicators over a span of years. It could lead to the development of new indicators, new monitoring strategies, and new programmes and policies in areas EPA determines to be highly important based on measured environmental trends. EPA's 2008 Report on the Environment is available at <http://www.epa.gov/roe>.

US 'State of the Air' Report

The American Lung Association has released its annual *State of the Air* report covering ozone and short-term and annual particulate pollution. Cities with the worst ozone pollution improved significantly during the past three years, but other cities are getting worse and the reduction in ozone levels across the country appears to be levelling off. Overall, ozone levels are not improving as fast or as much as they did between 1998 and 2002. The report (www.stateoftheair.org) provides trend charts showing ozone and year-round particulate pollution in each of the 25 most polluted cities. The report also incorporates the EPA analyses of ozone trend data to 2006 and particle pollution trend data for 2000 to 2006.

ASTM approves Biodiesel Specification

ASTM has approved changes to standard D975, the specification for conventional petroleum diesel, to allow up to 5% biodiesel. It has also approved a new specification for blends of 6-20% biodiesel (B6 to B20) for on- and off-road diesel.

Fuel Changes could affect Vehicle Benzene Emissions

Several Northeast US States have raised concerns that the US Environmental Protection Agency's rule on benzene alkylation at refineries could eventually lead to increased benzene emissions from vehicles.

EPA is requiring that gasoline must have a maximum benzene level of 0.62% by volume starting in 2011. The proposal recommends allowing refiners to use benzene alkylation as one possible process. The New York State Department of Environmental Conservation argues that alkyl benzenes can be air toxics themselves, can be dealkylated back to benzene in an engine, and can be transformed in the atmosphere into more toxic compounds. The Northeast States for Coordinated Air Use Management (NESCAUM) agrees, saying that the majority of the public's exposure to fuel-borne benzene occurs when gasoline and its combustion by-products are emitted from motor vehicles.

SOUTH AMERICA

Colombia to reduce Diesel Sulfur Levels

The Colombian Congress has approved a bill requiring the state oil company to progressively lower concentrations of sulfur in diesel fuel, in order to reduce air pollution. It requires state oil company Ecopetrol to reduce the sulfur content of diesel fuel sold nationally to no more than 50 parts per million by 2013 and would prohibit the distribution and

consumption of diesel fuel containing more than 50ppm sulfur.

In the interim, the law requires Ecopetrol to provide diesel with sulfur concentrations of no more than 500 ppm for public transport vehicles in the capital, Bogota, by 1 July 2008, and no more than 50ppm by 1 July 2010. Diesel sold in the capital for other vehicles must meet the standard of 50ppm by 1 July 2012. Outside the capital, the sulfur content of diesel fuel for use in vehicles must be reduced to 3000ppm by 1 July 2008, 2500ppm by 1 January 2009, 500 ppm by 1 January 2010; and 50ppm from 1 January 2013. Fuel used by the public Organised Systems of Mass Transit (SITMs), however, must contain no more than 50ppm of sulfur by 1 January 2010. Currently, diesel fuel sold in Bogota contains roughly 1200ppm of sulfur, while diesel sold in the rest of the country has a sulfur content of 4500 parts per million.

Chile to establish Environment Ministry

The Chilean government has sent a bill to the country's Congress that would create the nation's first Environment Ministry and a new regulatory body to enforce environmental norms. Environmental standards for air pollution are currently handled by a range of government bodies, including regional health services, with the existing national environment Commission (CONAMA) and its regional counterparts acting as coordinators. CONAMA will continue to run Chile's environmental approval system, established under the country's first environment legislation in the early 1990s. Renamed Servicio de Evaluación Ambiental, the body will seek "to simplify processes as well as improve the effectiveness and transparency of the evaluation".

ASIA-PACIFIC

Tokyo plans to Regulate Emissions of Fine Particulate Matter

The city of Tokyo has initiated a scientific study into PM_{2.5} in the city. The research will examine direct emissions from diesel vehicles, factories, and other sources as well as emissions from chemical reactions of sulfur and nitrogen oxides and other substances. Based on the findings, the city's Environmental Standards Division expects to set tolerance levels for PM_{2.5}, a process that could take up to three years. Tokyo successfully used regulations in 2003 to reduce the amount of suspended particulate matter released from diesel engines (see next item).

Air Quality Impacts of Diesel Emissions Regulations in Tokyo

In October 2003, the Tokyo Metropolitan Government began regulating emissions from diesel-powered trucks and buses under a local in-use particulate emission standard. A new paper from ICCT and Stanford University uses an empirically based emissions modelling approach to estimate the effect of these regulations on emissions of particulate matter and nitrogen oxides. Results indicate that Tokyo's regulations cut exhaust particulate emissions from diesel-powered trucks and buses registered in Tokyo by 17% and 31% in 2003 and 2004 through the promotion of diesel particulate filters and oxidation catalysts and by accelerating fleet turnover. Modest emissions reductions were also observed for nitrogen oxides. The model suggests that the bulk of emissions reductions – 70% for PM and 30% for NOx – made after 2002 and directly tied to environmental policies are attributable to Tokyo's local regulations rather than national emission control policies.

Source: Rutherford and Ortolano, Air quality impacts of Tokyo's on-road diesel emission regulations; Transportation Research Part D: Transport and Environment, [doi:10.1016/j.trd.2008.02.004](https://doi.org/10.1016/j.trd.2008.02.004).

Vehicles Pollution Increases in Madras

Central Pollution Control Board statistics show that the quality of air in the Madras Medical College campus has slowly deteriorated over the years, particularly with respect to respirable dust particulate matter (RSPM) and suspended particulate matter (SPM). The data show a high level of pollution with violations occurring 24% of the time for SPM and 19% for RSPM in the campus after monitoring for 91 days.

The average level of pollution with respect to RSPM has gone up from 42µg/m³ in 2005 to 71µg/m³ in 2006. Similarly, the SPM has increased from 121µg/m³ to 171µg/m³ in a year. The Tamil Nadu Pollution Control Board (TNPCB) said that the main cause is vehicular pollution at the junction of Central Railway Station and the college.

Singapore orders Euro V SCR Buses

Singapore Mass Rapid Transit has become the first bus operator in South-East Asia to use BlueTec[®] 5 buses to provide local public transport services. The company has ordered 66 Mercedes-Benz Euro V city buses and announced the initiative at the recent presentation of its 'SMRT is green' campaign.

MIDDLE EAST

Israeli Refinery promotes Euro 5

Israel's Oil Refineries Limited is launching a campaign to raise public awareness of the need to advance the use of Euro 5 vehicle emissions standards planned for 1 January 2009. At present, though, Euro 5 diesel is only available at a limited number of filling stations and only the 98 octane gasoline, accounting for just 2% of the market, meets the Euro 5 standard. The company says it wants to begin marketing 95 octane Euro 5 gasoline immediately but this depends on consumer demand. It says that Egged, Israel's largest bus cooperative, has already switched to Euro 5 diesel and others are expected to do so soon.

RESEARCH SUMMARY

Health Effects Research

Short Term Links between Air Pollution and Mortality

A new study from the French Institute for Public Health confirms significant relationships between the levels of air pollution commonly observed in nine French cities and mortality, especially for cardiovascular causes. Over the nine participating cities, significant associations were found between every air pollutant and mortality indicators studied. The relative risk of death (excluding external causes) increased significantly following a $10\mu\text{g}/\text{m}^3$ increase in the levels of air pollution indicators on the day of the event and the previous day.

Source: Programme de surveillance air et santé: Analyse des liens à court terme entre pollution atmosphérique urbaine et mortalité dans neuf villes françaises, Institut de Veille Sanitaire. www.invs.sante.fr/publications/2008/psas_mortalite/psas_mortalite.pdf.

Effects of Long-term Exposure to Traffic Pollution

Long-term exposure to air pollution from traffic emissions is associated with higher rates of mortality than previously thought, according to a new paper. The researchers calculated exposure to NO_2 , SO_2 , $\text{PM}_{2.5}$ and black smoke at the homes of 120 852 participants, aged between 55 and 69, across the Netherlands. The participants' mortality was assessed over a 10-year period and the cause of death was noted. The findings show that long-term exposure to traffic-related air pollution is associated with an increase in risk of dying from respiratory-related conditions, such as lung cancer. These associations were most notable for NO_2 and black smoke.

Source: Beelen et al., Long-Term Effects of Traffic-Related Air Pollution on Mortality in a Dutch Cohort (NLCS-Air Study). *Environmental Health Perspectives* 116, 196-202, (2008). www.ehponline.org/members/2007/10767/10767.html.

Bronchial Response to Diesel Exhaust

A paper from University Hospital of Umeå, Sweden with Kings College London, UK and the University of Southampton, UK, reports in-vivo test results used to examine inflammatory responses in the airways on exposure to diesel exhaust. The authors found that exposure to diesel exhaust with PM_{10} levels of $300\mu\text{g}/\text{m}^3$ caused enhanced epidermal growth factor receptor (EGFR) expression and phosphorylation of the tyrosine residue, suggesting these have a key role in the bronchial response to diesel exhaust.

Source: Pourazar et al, Diesel exhaust increases EGFR and phosphorylated C-terminal Tyr 1173 in the bronchial epithelium; *Particle & Fibre Toxicology* 2008, 5:8, [doi: 10.1186/1743-8977-5-8](https://doi.org/10.1186/1743-8977-5-8)

Study in Italy links PM_{10} to Deep Vein Thrombosis

Researchers at the Harvard School of Public Health in Boston, USA say they have found that air pollution with high concentrations of small particles (PM_{10}) may cause blood clots in the legs. The researchers found the link after looking at 870 people in the Lombardy region of Italy who had developed deep vein thrombosis (DVT) between 1995 and 2005. When compared with 1210 others living in the same region who did not have the problem, they found that for every increase in particulate matter of $10\mu\text{g}/\text{m}^3$ the previous year, the risk of deep vein thrombosis increased by 70%. In addition the blood of those with higher levels of exposure to particulate matter was quicker to clot when tested at a clinic.

Source: Baccarelli et al, Exposure to Particulate Air Pollution and Risk of Deep Vein Thrombosis; *Archives of Internal Medicine*, Vol. 168 No.9, 12 May 2008, p.920-927. archinte.ama-assn.org/cgi/content/full/168/9/920.

New Findings link Pollution to Childhood Allergies

Researchers from Helmholtz Research Centre for Environment and Health in Munich say that the risk of developing asthma, hay fever, eczema or other allergies is about 50% higher for children living 50 metres from a busy road than for those living 1000 metres away. The study followed 3000 healthy children from all over Munich for six years from birth. The researchers assessed long-term exposure to $\text{PM}_{2.5}$ and NO_2 and mapped each residential address and the distance to busy roads (>10000 vehicles/day). They then developed a model to calculate exposure to pollution at birth and ages 2, 3 and 6. The authors say that they consistently found strong associations between the distance to the nearest main road and the allergic disease outcomes. They will continue monitoring the children over the next few years to determine whether moving to a less-polluted area can reverse any of the traffic pollution-related problems.

Source: Heinrich et al, Atopic Diseases, Allergic Sensitization, and Exposure to Traffic-related Air Pollution in Children; *American Journal of Respiratory and Critical Care Medicine* Vol 177. pp1331-1337, (2008). [doi:10.1164/rccm.200701-036OC](https://doi.org/10.1164/rccm.200701-036OC).

Asthmatic Children and 'safe' Levels of Pollution

Researchers examined the relationship between daily concentrations of air pollutants and the prevalence of respiratory problems in a large sample of children with asthma living in seven inner-cities across America. Levels of NO₂, PM_{2.5}, SO₂, ozone (O₃) and CO were compared with lung function tests and respiratory symptoms. Despite the fact that the measured concentrations of air pollutants were almost all consistently below the limits set by US air quality regulations, the study found significant relationships between the incidence of breathing problems in children and their exposure to pollutants in the air. Children had considerably lower lung function tests when exposed to higher concentrations of NO₂, PM_{2.5} and SO₂, when these pollutants were measured as five-day averages, while raised levels of NO₂ and PM_{2.5} were associated with missed school days as a result of asthma. Raised NO₂ levels were also associated with respiratory symptoms.

Source: O'Connor et al, Acute respiratory health effects of air pollution on children with asthma in US inner cities. *Journal of Allergy and Clinical Immunology*. 121(5), 1133-1139 (2008).

Particulate may raise Risk of Stroke

Short-term exposure to low levels of particulate air pollution may increase the risk of stroke or mini-stroke, according to new research that examined particulate air pollution in the southeast Texas community of Corpus Christi. The results showed what the researchers called "borderline significant associations" between same day and previous day exposures to fine particulate matter and risk of ischemic strokes. Ischemic stroke occurs when an artery to the brain is blocked.

Source: Ambient Air Pollution and Risk of Ischemic Stroke and TIA; *Annals of Neurology*, Vol. 63 Issue 7, July 2008, www3.interscience.wiley.com/journal/76507645/home.

Variation in PM Composition with Area

As part of an ongoing epidemiological study to investigate the effects that pollutants have on the health of pregnant women and their unborn children, Spanish researchers selected four monitoring sites across Valencia, Spain, to represent urban, metropolitan, suburban and rural areas. Air samples were taken between 2004 and 2005, at three different times during the participants' pregnancies. The chemical composition and concentrations of PM_{2.5} and PM₁₀ were identified for organic, man-made and mineral sources. For man-made particulate matter, there was a clear gradient from urban to regional areas, suggesting that roughly half the air pollutants in cities have a local origin. For particulate matter of mineral origin, there was no such gradient. However, in winter these levels of PM_{2.5} were higher in the cities and the researchers suggest this is caused by re-

suspension of dust created by traffic. The study also showed that the levels of fifteen PAHs found in particulate matter were similar to, or slightly higher than, levels reported from other Spanish sites.

Source: Viana et al., Characterising exposure to PM aerosols for an epidemiological study; *Atmospheric Environment*. 42: 1552-1568, (2008).

Pollution from Residential Wood Burning

In Northern Europe, wood-burning to heat homes in residential areas may be the main source of a number of harmful pollutants in local air, new research has shown. Finnish researchers identified the exact compounds released by wood combustion, and measured the proportion of pollutants in the air produced by burning wood. Measurements were taken during winter in a residential area of Finland, selected for its isolation from other major sources of air pollution, such as main roads and local power stations. The main sources of the pollutants were found to be from wood burning and traffic emissions, but wood smoke was the biggest contributor of many organic compounds. Up to 70% of benzene detected in the air was from wood smoke. The association between the levels of PM_{2.5} and PM₁₀ and wood combustion in this study was less definite, but the study suggested that peaks in the levels of particles were linked to the increase of local wood burning.

Source: Hellén et al., Influence of residential wood combustion on local air quality; *Science of the Total Environment*, 393 (2-3), 283-290, (2008).

Emissions Study on Biodiesel Blends with Methanol

An new paper from Tianjin University and Hong Kong Polytechnic University compares the effect of applying a biodiesel converted from waste cooking oil with either 10% blended methanol or 10% 'fumigation' methanol. Experiments were performed on a 4-cylinder naturally aspirated DI diesel engine operating at a constant speed of 1800 rev/min with five different engine loads. The authors say that the results indicate a reduction of CO₂, NO_x and particulate mass emissions and a reduction in mean particle diameter, for both fuels compared with diesel fuel. In the 'fumigation' mode, an extra fuel injection control system is required, and there is also an increase in CO, HC and NO₂ and particulate emissions in the engine exhaust, which are disadvantages compared with the blended mode.

Source: Cheng et al, Comparison of emissions of a direct injection diesel engine operating on biodiesel with emulsified and fumigated methanol; *Fuel*, 2008, 87(10-11):1870-1879. [doi: 10.1016/j.fuel.2008.01.002](https://doi.org/10.1016/j.fuel.2008.01.002).

Air Pollution and Plants

Effect of Trees on Air Pollution-related Asthma

Roadside trees may help reduce childhood asthma related to air pollution, according to a new study conducted in New York City by Columbia University. As the density of trees in a neighbourhood rose, asthma prevalence fell, even after the researchers accounted for the percentage of residents living below the poverty line, proximity to pollution sources such as busy truck routes, and other relevant factors. The report follows a UK paper (McDonald et al) which concluded that planting trees in urban areas could cut PM₁₀ pollution by as much as a quarter as trees are particularly good at capturing PM₁₀ on leaf surfaces.

Source: Lovasi et al, Children living in areas with more street trees have lower asthma prevalence; *J. Epidemiol. Community Health*, May 2008; [doi:10.1136/jech.2007.071894](https://doi.org/10.1136/jech.2007.071894).

Using Plants to monitor Air Pollution

Researchers from Banaras Hindu University, Varanasi, India have used a plant micronucleus bioassay to assess the genotoxicity of air. Four sites were selected, three in the city having different traffic characteristics and one control site virtually free from traffic intervention. Twenty young *Tradescantia pallida* inflorescences were collected and examined from each sampling site during the study period and the concentration of different air pollutants were also measured. The *Tradescantia* micronucleus bioassay showed that the plants kept in areas having higher traffic emissions showed higher micronuclei frequencies than samples kept at the control site. The authors say that the study indicates that in situ biomonitoring using higher plants may be useful for characterizing genotoxic air pollutants in areas even without any sophisticated instrument.

Source: Prajapati & Tripathi, Assessing the genotoxicity of urban air pollutants in Varanasi City using *Tradescantia* micronucleus (Trad-MCN) bioassay; *Environment International* (2008), [doi:10.1016/j.envint.2008.03.009](https://doi.org/10.1016/j.envint.2008.03.009).

Innovation Award for Particulates Project

The Dutch Technical University Delft and construction company BAM have won the Dutch 'Intertraffic Innovation Award 2008' for a novel way to tackle fine dust from traffic. Fine dust particles suspended in the air above the road surface are captured by an electrostatic field created by electric wires high above the road. The particles are given an electrostatic positive charge and are then attracted by the road. The system is claimed to reduce fine particles by dozens of percents. Discussions for conducting a real-world test of the system seem to be ongoing with the Amstelveen and Delft municipalities.

GENERAL

50 Years of UN-ECE Regulations

On 26 June 2008, the United Nations offices in Geneva celebrated the 50th anniversary of the International Agreement on motor vehicle regulations. The 1958 Agreement set down the basic rules that motor vehicles and their components must meet to conform to international legislation. Currently, almost 130 regulations annexed to the agreement govern safety, environmental and security issues. These include regulations 49 (heavy-duty engine emissions) and 83 (light-duty vehicle emissions). Originally focussed on the European market, the agreement and its separate regulations now reach into Asia, Oceania and Africa.

IFQC Ranking for Low-sulfur Diesel

The International Fuel Quality Center (IFQC) has ranked 100 countries for sulfur levels in diesel, based on national and local/regional standards, year of implementation, and actual market sulfur levels.

The IFQC found Sweden to be at the top of the ranking with the earliest implementation of the lowest sulfur limits, followed by Germany and Japan. All EU countries are within the top 50; nearly 100% market penetration of 10ppm diesel is expected in the EU in 2009. IFQC says that the majority of countries around the world are moving toward low sulfur fuels. Sulfur levels of both gasoline and diesel can vary greatly in countries such as Brazil, Malaysia and Saudi Arabia. The range of sulfur content also varied dramatically between those nations that topped this ranking and those that did not – countries at the bottom of the ranking allow for as much as 5000ppm sulfur in their diesel. The complete tables can be found on the IFQC's website at www.ifqc.org/NM_Top5.aspx.

Updated ISO Emissions Standard

An updated version of ISO 8178-2 (Measurement of gaseous and particulate exhaust emissions under field conditions) has been issued as ISO 8178-2:2008. This standard, together with ISO 8178-1 and ISO 8178-11, specifies the measurement and evaluation methods for gaseous and particulate exhaust emissions from reciprocating internal combustion engines under steady-state and transient conditions for field testing.

ISO 8178-2:2008 is applied when engines used in off-road vehicles, marine installations, generating sets, diesel rail traction or similar applications must be measured under field conditions or at site in order to determine the in-use compliance or when it is not possible to take the measurements under test-bed conditions or use the test-bed measurement results.

FORTHCOMING CONFERENCES

Diesel Engine Efficiency & Emissions Research Conference (DEER2008)

4-7 August 2008, Dearborn, Michigan, USA

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

The US Department of Energy will showcase its cooperatively funded R&D with its partners, national laboratories, automotive industry, universities, and other national and international organisations.

European Aerosol Conference

24-29 August 2008, Thessaloniki, Greece

Details at www.eac2008.org

5th International Conference on Environmental Catalysis

31 August - 3 September 2008, Belfast, N. Ireland

Details at www.qub.ac.uk/centacat/5icec/

Sessions cover automotive emissions control, catalysis for the production of clean fuels, catalysis for sustainable energy conversion and greener process intensification.

Materials Science and Engineering

1-4 September 2008, Nürnberg, Germany

Details at www.mse-congress.de/index.php?lg=en

Topic areas include nanostructured materials, functional and structural ceramics, functional microporous materials, advanced surface engineering, characterisation and processing,

Ricardo seminar: Diesel particulates and NOx control

2 September 2008, Shoreham-by-Sea, UK

Details at www.ricardo.com/seminars

The agenda covers legislative requirements, fundamentals of NOx and PM formation, engine and aftertreatment systems, particle measurement and the formation and control of non-regulated NOx species.

2nd Annual Congress: Selective Catalytic Reduction

2-4 September 2008, Frankfurt a.M., Germany

Details at www.iqpc.com/de/SCR-Systems

The congress will explore challenges for SCR systems like engine performance, packaging and low temperatures, discuss alternative reducing agents and analyse the opportunities for combining SCR with EGR or DPF to meet future standards.

European KONES 2008: International Scientific Congress on Powertrain and Transport Means

7-10 September 2008, Warsaw, Poland

Details at www.ilot.edu.pl/STRANG/kones2008.html

The conference will cover the latest achievements in research, development and design of compression-ignition and spark-ignition engines and hybrids, with special attention to issues such as bio-fuels, combustion processes and exhaust aftertreatment.

SAE Small Engine Technology Conference

9-11 September 2008, Milwaukee, USA

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

20th International AVL Conference "Engine & Environment"

11-12 September 2008, Graz, Austria

The theme for this year's conference is "120g CO₂/km – what about driving fun and costs? Engine & Environment 2008 will invite authorities from industry, academia and the political world to discuss solutions and strategies.

FISITA 2008 World Automotive Congress

14-19 September 2008, Munich Germany

Details at www.fisita2008.com

The topic area on future powertrain solutions includes strategies for future ultra-low exhaust emissions limits and strategies and engines for future fuels. The simulation and testing topic includes harmonisation of international legislation.

The 2008 European Transport Forum

16-18 September 2008, Brussels, Belgium

Details at www.europeantransportforum.eu/

A series of 3 high level seminars, focusing on urban mobility, road safety and transport & the environment.

7th International Motorcycle Conference 2008

6-7 October 2008, Cologne, Germany

See www.ifz.de/e-events-conferences-7intmotorcycle.htm

Environmental aspects to be covered are motorcycle emissions, standards and measurement procedures.

17th Aachen Colloquium "Automobile and Engine Technology"

6-8 October 2008, 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.

SAE 2008 Commercial Vehicle Engineering Congress and Exhibition

7-9 October 2008, Rosemont, Illinois, USA

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

This event will cover all on- and off-road applications for commercial vehicles and include alternative fuels, emissions and global harmonisation.

International conference 'Environment & Transport in different contexts'

27-29 October 2008, Ghardaïa, Algeria

Details at www.inrets.fr/nojs/services/manif/ghardaia-oct08/index.html

The conference deals with the environment issues related to transport in different areas with a particular focus on the Southern countries. The main topics to be dealt with are transportation systems and environmental impacts, evaluation methodology, control technology and transportation policy.

Near Zero Emission Vehicle Technologies Conference

30 October 2008, Dearborn, Michigan, USA

Details at www.itbgroup.com/conferences_NZEV.htm

Proposed topics include EGR systems, strategies for reducing CO₂, nitrous oxide reduction approaches including SCR, and Diesel particulate filters.

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 direct injection engines.

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.

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 emissions aftertreatment, SCR

system components, applications and strategies and urea infrastructure.

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.

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 controls - 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.

Deadline for abstracts is 15 October 2008

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.

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.

Deadline for proposed papers is 12 September 2008

13th ETH Conference on Combustion-Generated Nanoparticles

22-24 June 2009, Zurich, Switzerland