# Newsletter

**September - October 2006**

# INTERNATIONAL REGULATORY DEVELOPMENTS

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## EUROPE

### Environment Committee Vote on Euro 5

On 13 September 2006 the European Parliament's Environment Committee voted in favour of new emissions standards for passenger cars and light-duty vehicles - Euro 5 - to apply from 1 September 2009. The Committee voted first "en bloc" on 6 compromise amendments that were agreed between the Rapporteur and other political groups. The remaining amendments, those not overruled by the compromise ones, were then voted upon. The Environment Committee's report and proposed amendments will now go to a first-reading vote at a plenary session of the European Parliament. This was originally expected to be at the end of October, but is not now expected before the end of November 2006.

MEPs called for the new Euro 5 standard to apply to new Type Approvals from 1 September 2009 for cars (M1 vehicles). M1 vehicles with a maximum laden weight of more than 2000 kg and designed to meet specific "social needs", e.g. true off-road SUVs, vehicles to take wheelchairs or to seat seven or more people, and light commercial vehicles (N1s) would have until 1 September 2010 to comply. Following transition periods extending up to 1 January 2011 (M1s) and 1 January 2012 (special M1s and N1s) respectively, all registrations would then have to comply with the Euro 5 standards on emissions and fuel consumption.

In addition, MEPs proposed limits and starting dates for the next stage, Euro 6. MEPs agreed that the start dates for new Type Approvals to meet Euro 6 should be 1 September 2014 for cars (M1s) and 1 September 2015 for light commercial vehicles (N1s). Transition periods for existing models would run up to 1 September 2015 and 1 September 2016 respectively. By these dates all new registrations would have to meet the Euro 6 requirements. The derogation for the specific heavy M1 vehicles meeting "social needs" is for the Euro 5 stage only and would drop for Euro 6.

The Euro 5 limits proposed in the compromise amendments would be 70mg/km NOx for positive-ignition (PI) engines instead of the 60mg/km proposed by the Commission, but 180mg/km for compression-ignition (CI) engines instead of 200. There would be a similar 20mg/km reduction in the CI engine HC+NOx limit. In place of a 75mg/km HC limit for PI engines the current 100mg/km limit would be retained as a total HC limit, but with the addition of a 68mg/km non-methane hydrocarbon (NMHC) limit. For Euro 6, the only change would be to the CI limits for NOx and HC+NOx. The 70mg/km NOx limit would apply to both PI and CI engines, with the HC+NOx limit being 170mg/km. (The figures quoted above are for M1 and N1 class I limits. Figures for N1 class II and III are proportionately higher).

Durability testing of pollution control devices undertaken for type approval will cover 160 000km. However, to comply with this, the manufacturers may, under the proposals, choose to make use of test bench ageing which will be subject to the implementing conditions in the Commission Regulation that is currently being discussed with and prepared by DG Enterprise.

### Euro 5 'Comitology' and Euro 6 Impact Assessment

Whilst discussion on the 'political' part of the light-duty Euro 5 and Euro 6 requirements continues in the Parliament and between the EU's three legislative institutions (Parliament, Council of Ministers and Commission), the European Commission has started discussions with stakeholders on the technical contents (test procedures etc.) for the Regulation and on the Impact Assessment to support Euro 6.

The Commission has provided stakeholders in MVEG, the Motor Vehicle Emissions Group, with a draft of the 'comitology' document. This will be published with or immediately after the 'political' part which contains limit values and implementation dates. The comitology gives details of the test methods and other key details necessary to operate the Regulation. It will be published as a Commission Regulation through the process on Adaptation to Technical Progress, thus allowing faster updating of technical issues if necessary, without having to go through the lengthy co-decision procedure with Parliament and Council.

The technical regulation will use references to ECE regulations for much of the content, including test procedures. Several working groups on specific annexes have been set up with stakeholders, and are due to complete the proposals by the end of the year. In addition, the Commission has also held an initial meeting with stakeholders to review their draft Impact Assessment on Euro 6. The original Commission proposal and related Impact Assessment covered only the Euro 5 step, but this is now being extended in light of the calls for a Euro 6 step to be included now.

### PMP Light-Duty and Heavy-Duty Exercises

The European Commission's Joint Research Centre (DG JRC) at Ispra, Italy hosted meetings on the light-duty and heavy-duty PMP (Particulate Measurement Programmes) on 12 and 13 September 2006.

The PMP light-duty validation exercise has tested 16 vehicles; 5 diesels with particulate filter (DPF), plus the 'golden vehicle', 6 conventional diesels, 3 direct injection gasoline engines and 1 conventional

gasoline engine. The results of all the DPF vehicles were statistically similar to the golden vehicle, with direct injection gasoline vehicles and non-DPF diesels differentiated from DPF vehicles and each other. Levels for the conventional gasoline vehicle were similar to the diesels with DPF. Particle numbers were similarly differentiated; the coefficient of variance for the DPF vehicles appears to reflect the fill state of the DPF. The initial conclusions are that the improved mass method is sufficiently sensitive for measurements to below 2.5mg/km; the number method is 20 times more sensitive. Both mass and number are sensitive enough to discriminate between DPF and non-DPF diesels.

The heavy-duty working group agreed a dual approach for validation of the heavy-duty protocol. There will be a validation exercise with 'golden engine' with DPF, 'golden instruments' and 'golden engineer', similar to the light-duty validation. In addition there will be a round-robin using an engine with wall-flow DPF The round-robin will not use 'golden instruments' or the 'golden engineer'. Test work will start with some investigative work at JRC at the start of 2007, with both the validation tests and the round-robin commencing about 3 months later.

## Commission Workshop on $NO_2$

The European Commission's Directorate-General for Environment organised a workshop on "The Impact of Direct Emissions of $NO_2$ from Road Vehicles on $NO_2$ Concentrations" in Brussels on 19 September 2006.

The first part of the workshop addressed direct $NO_2$ emissions and their influence on measured ambient concentrations of $NO_2$. This included reviews of the atmospheric chemistry of $NO_2$ and measurements in Germany, the UK and the Netherlands. Measurement procedures for $NO_2$ were discussed, with experts proposing that $NO_2$ needs to be measured from raw gas with heated sample lines using fast techniques (i.e. not switching chemiluminescence). It was also noted that for vehicles with SCR, ammonia and $NO_2$ can react in the $NO_2$-NO converter of chemiluminescence analysers, leading to incorrect estimates of $NO_2$.

The second part of the programme examined the technologies, with presentations from the motor industry and AECC. The utilisation of $NO_2$ in DPF regeneration and in speeding NOx-removal reactions was discussed, together with the use of SCR and NOx adsorber systems to significantly reduce both total NOx and $NO_2$.

## Motorcycle Directive with WMTC Limits published

The correlated European limit values for the World-harmonised Motorcycle Test Cycle have been published as Commission Directive 2006/72/EC.

The following table shows the existing Euro 3 limits on the ECE cycles (Row B) with the new limits for the WMTC (Row C).

| g/km | Vehicle class | Test cycle | CO | HC | NOx |
|---|---|---|---|---|---|
| B | < 150 cc | Cold, 6*UDC | 2,0 | 0,8 | 0,15 |
| | ≥ 150 cc | Cold, 6*UDC + EUDC | 2,0 | 0,3 | 0,15 |
| C | $V_{max}$ <130km/h | WMTC | 2,62 | 0,75 | 0,17 |
| | $V_{max}$ ≥130km/h | WMTC | 2,62 | 0,33 | 0,22 |

The Commission is now expected to publish an Internet consultation on a draft co-decision Directive on the other motor cycle issues within the next few weeks. The main issues are durability, $CO_2$ requirements, Euro 3 for tricycles and quadricycles, Stage 3 for mopeds, and evaporative emissions.

## Study on Regulatory Measures for Emissions Control of Two-Wheelers

A European Commission-sponsored study on possible regulatory measures for powered two-wheelers has now been published[1]. The study examines the contribution to emissions made by motorcycles and mopeds in Europe over the period 1999-2012 and assesses the environmental benefits and the costs associated with different emissions control measures. These include durability requirements for emissions control, in-use compliance and roadworthiness procedures, on-board diagnosis, control of evaporation emissions, specific measures regarding particulate matter and new steps for emissions standards.

The study finds that, if no additional regulatory measures are taken, motorcycles and mopeds in Europe will emit more than 7% and 20% of total road transport carbon monoxide and unburned hydrocarbons respectively by the year 2012. In order to control rising unburned hydrocarbon emissions, both evaporative emissions control and roadworthiness tests are cost-effective. A further tightening of the emissions standards for mopeds will be the most expensive but also the most effective measure.

[1] Ntziachristos et al (2006); Emission control options for power two wheelers in Europe, Atmospheric Environment 40(24):4547-61

## EU Environment Council agrees Common Position on CAFÉ & Air Quality

The EU's Council of Environmental Ministers has reached political agreement on the draft Directive on ambient air quality and cleaner air for Europe.

The agreement includes a non-binding target value of 25µg/$m^3$ for PM2.5 in 2010, to be replaced by a binding limit value in 2015; the possibility of postponing attainment of the limit value for PM10 until three years after entry into force of the Directive; the possibility of postponing the deadlines for $NO_2$ and benzene by a maximum of five years (until 1 January 2015); and the principle that limit values should apply everywhere, but in certain locations compliance with limit values should not be assessed. The proposals will now be further considered by Parliament.

## European Commission Workplan for 2007

The European Commission has issued its workplan for 2007, comprising 21 strategic initiatives and a list of the main policy actions to be adopted over the next 12-18 months. The top priorities for 2007 include issuing the first Strategic Energy review of Europe, a Green Paper on climate change, a White Paper on health strategy and a Green Paper on urban transport. There will also be a Commission Communication on the implementation of National strategies for Green public procurement based on EU-wide target setting and regular monitoring and benchmarking.

The listing of Priority Initiatives includes:

- A proposal for a co-decision Regulation on heavy-duty engine emissions (Euro VI).
- A legislative initiative to reduce $CO_2$ emissions from light-duty vehicles.
- Revision of Directive 2001/81/EC on national emission ceilings for atmospheric pollutants.
- A review of existing legislation on industrial emissions, including large combustion plants.
- A communication on a European Ports Policy, including environmental issues.

## Dutch Environmental Zones, Grants for Particulate Filter fitment

The Dutch Environment Ministry, VROM, has announced that ten of the largest municipal authorities in the Netherlands, the Dutch Government and the business community have concluded an agreement on environmental zoning. From 1 April 2007 only 'clean trucks' will be allowed to enter the centre of cities that are party to the agreement. Euro II and III trucks will have to be fitted with particulate filters.

From 1 October 2006, the Netherlands will begin providing grants to help cover the cost of fitting DPFs to trucks and buses. The amount of grant depends on engine power and filter type, ranging from €1000 for an open filter fitted to a heavy delivery van (3500 to 5000kg) to €11 000 for both fitting a closed filter and decreasing NOx on a vehicle of over 225kW power.

The government has set up a Type Approval scheme for filters. This was drawn up in cooperation with the German Federal Environment Ministry so that the same filters can be used for both markets. The technical requirements are identical to those expected to be adopted by Germany but the application procedure will be different and the Dutch scheme will include Conformity of Production (CoP) requirements. The Netherlands also intend to encourage systems that limit NOx, e.g. SCR, and say that Type Approval requirements will be announced in the coming months.

## Danish Technical Requirements for Particulate Filters

Denmark has notified the EU of their draft Order on the technical requirements for particulate filters for diesel-powered lorries and buses over 3.5 tonnes. The regulation mainly concerns systems that are intended to be used in one of the environmental zones established in Copenhagen, Frederiksberg, Århus, Aalborg and Odense.

The Order covers the technical requirements and documentation needed for both Danish-registered and foreign vehicles. The filters must reduce particles by at least 80%, measured using recognised EU methods, and have a maximum back pressure of 20kPa at the engine's maximum power. Approvals from schemes in England, Germany (class A), the Netherlands (class A), Italy, France and Sweden will be accepted provided that the approval indicates a particulate emissions reduction of ≥80%.

## Italy to introduce Emissions-based Vehicle Taxes

The Italian press has reported that the government is to introduce vehicle taxes based on both the power output and the emissions level. The tax is designed to produce higher charges for SUVs but will also increase tax rates for higher-powered family cars. The previous proposal envisaged a tax based on weight.

The proposed annual rates (per kW) are reported as:
Euro 0: €3.00 up to 100kW, €4.50 above 100kW
Euro 1: €2.90 up to 100kW, €4.35 above 100kW
Euro 2: €2.80 up to 100kW, €4.20 above 100kW
Euro 3: €2.70 up to 100kW, €4.05 above 100kW
Euro 4/5: €2.58 up to 100kW, €3.87 above 100kW

For buses and special vehicles this will be respectively €2.94 and €0.43 per kW.

## Dutch Investigation of Replacement Automotive Catalysts

The Dutch VROM-Inspection authority is to start an investigation into illegal replacement catalysts, as a result of indications from the market that non-approved replacement catalysts are being sold. VROM says that the consequences of using illegal catalysts could be significant increases in emissions resulting in a worsening of Dutch air quality.

VROM-Inspection wants to check whether replacement catalysts on the Dutch market fulfil European legal requirements and are approved. They will check for the presence of a type approvals marking on the catalyst and that it matches the appropriate vehicle type list and approval certificate. The investigation, which will focus on about ten importers, was to be completed by the end of October.

## Austrian UBA report on 2005 Air Quality

The Austrian Federal Office for Environment Protection has issued a report on air quality for 2005.

Ozone levels were relatively low in the summer 2005 – only the information threshold was crossed, on 18 days. PM10 limits were exceeded at 28 measuring points in 2004 but this rose to 58 in 2005. Limit value exceedances for $NO_2$ were also registered, particularly at measuring stations near traffic. Although $NO_2$ was declining into the late 1990's, there has been a rise in $NO_2$ levels and exceedances since 2000 at some measuring points.

The report says that for the $NO_2$ exceedances, increasing traffic is mainly responsible. For the PM10 exceedances the causes are more varied: apart from traffic, home heating and building activity play a substantial role, along with local industry. Additionally long-distance transport of fine particulate can contribute up to 50% of the measured PM10.

Details of Austrian air quality can be found in the report “Luftgütemessungen in Österreich 2005“ at http://www.umweltbundesamt.at/fileadmin/site/publikationen/REP0065.pdf

## UK Research Project to fit Mobile Pollution Sensors to People and Buses

The UK Department for Transport has announced a research project aimed at reducing traffic pollution through the use of mobile sensors. Small sensors will be fitted to volunteers and public buses with the aim of collecting real time air quality data to show how the weather, street design and driving behaviour affect the build-up of traffic pollution.

## Health Experts urge EU to Tighten Air Pollution Standards

Health experts have called on the European Union to toughen proposals on curbing two forms of air pollution linked to thousands of premature deaths per year. The joint appeal by air pollution scientists and respiratory doctors, attending major conferences in Paris and Munich, coincided with a European Parliament debate on the CAFÉ air quality directive.

The experts' joint statement attacked the CAFÉ proposal for a 30µg/m$^3$ limit for PM10 as “badly weakening current regulations”. CAFÉ's provisions for PM2.5 were also said to be too high and were criticised for being non-binding. The experts also criticised the time given to governments to enforce the limits and a loophole that meant "natural" sources of particulates could be taken into account.

The Paris conference gathered leading experts in pollution and epidemiology; the Munich conference was the annual congress of the European Respiratory Society (ERS). A study presented in Paris calculated the number of premature deaths that would occur in European countries if 2.5-micron particulates were limited to CAFÉ's 25µg/m$^3$ or if, as in the United States, a 15µg/m$^3$ limit was used. The study claimed the former limit would save 4500 lives annually but the latter would save 13300 lives.

## European Parliament attempts to link Car Taxes to $CO_2$ and Pollution

MEPs have adopted by 385 votes to 139 (with 109 abstentions) a report saying annual circulation taxes linked to the level of pollution produced by the car should be used instead of registration taxes.

According to the Commission, the wide variation in registration taxes distorts the internal market, is administratively complex, encourages tax avoidance and can often mean people buying a vehicle in one Member State then moving it to another have to pay twice. The Commission proposed a directive to phase out registration taxes over ten years and replace them by Annual Circulation Taxes linked to $CO_2$ emissions.

Parliament has now approved a report on the subject. This backs the Commission’s general approach, but says that the environmental aspect should be broader, with the level of tax linked to fuel efficiency and to pollutant emissions as well as $CO_2$. As for most taxation issues, Parliament's role is only consultative - the final decision must be taken unanimously by the Council. The requirement for unanimity means that the proposal may not progress further.

## Norwegian Commission Identifies Low Emissions Scenarios

The Norwegian Commission on Low Emissions, which is examining how Norway can reduce its emissions of greenhouse gases by 50-80% by 2050, presented their final report to the Minister of the Environment on 4 October 2006. The report says that the Norwegian government must, during the current parliamentary term, implement a number of measures including investing in low- and zero-[$CO_2$]-emission vehicles. This requires automobile taxation based on environmental incentives, government purchases, government regulation, and ensuring the sale of biofuels in an amount equivalent to at least 5% of the total sales in 2009.

The report projected a reference scenario of about 70 million tons $CO_2$-equivalent by 2050. About three quarters of the emissions in this scenario are distributed fairly evenly between electricity production, the process industry, and transportation. The Norwegian Commission has identified 15 measures, mainly directed at specific and major emissions sources. The measures for transportation include the phasing-in of low- and zero-emission vehicles, such as hybrid cars, light diesel cars, electric cars, and fuel-cell cars; the phasing-in of $CO_2$-neutral fuels, such as bioethanol, biodiesel, biogas and hydrogen; the development of low-emission ships; and a reduction of transportation demands through improved logistics and urban planning.

## France plans E85 Network and Higher Levels of Biofuels

The French Finance Minister has backed plans to develop the large-scale use of 'Flex Fuel E85' (85% ethanol with gasoline). An action plan drafted by ex-Formula One driver Alain Prost will begin in January 2007. It includes stepping up energy-crop production, deploying flex fuel pumps and making sure that carmakers offer flex fuel cars at a cheap enough price. Special tax incentives will be tabled before the end of the year in order for E85 to remain a cheap option for consumers.

France has also notified the European Commission that it intends to increase the permissible oxygenate content of gasoline and FAME (Fatty Acid Methyl Ester, or biodiesel) content in diesel. The amendment to French fuel requirements would increase the maximum ethanol content from 5% to 10% by volume, the maximum oxygen content from 2.7% to 3.7% by mass and allow 20% by volume of ETBE. The content for other ethers such as MTBE remains unchanged at 15%. The draft Order would also amend the maximum FAME content of diesel fuel from 5% by volume to 10% by volume. The proposed biofuel levels are higher than those permitted under the currently EU fuels directive, but would align with levels widely expected to be proposed from the Commission's review of that directive.

# NORTH AMERICA

## Canada to adopt California Emissions Standards

The Canadian Government has released details of a proposed Clean Air Act covering greenhouse gases, ozone-forming gases, and other air pollutants.

The proposals aim to harmonise Canadian vehicle emissions standards with those of the US over the next 12 months and to align regulations on volatile organic compound emissions with those of the US. The plan also aims to cut greenhouse gas emissions from 2003 levels by 45 to 65% by 2050. This will be achieved by introducing new regulations for vehicle fuel consumption (by 2011) and by setting targets for industry to reduce the amount of energy used per unit of production. By 2025, federal targets for smog and ozone levels will be set. The Act will redefine a number of substances, previously labelled as toxic, as air pollutants.

## Quebec introduces Heavy-Duty Vehicle In-Use Inspection Programme

The Canadian province of Quebec has commenced their PIEVAL (Programme d'Inspection et d'Entretien des Véhicules Automobiles Lourds) inspection and maintenance programme for heavy-duty vehicles. Roadside tests will measure the opacity of exhaust smoke using a snap acceleration test. For the first two years of the programme, acceptable opacity rates will be 45% for 1991 or newer trucks, and 60% for 1990 models and older. After two years, these limits will be reduced to 40% and 55% respectively.

## EPA Strengthens US Air Quality Standards for Particulate Matter

The US Environmental Protection Agency has issued its final rule on new national PM standards. States must meet the revised standards by 2015, with a possible extension to 2020, depending on local conditions and the availability of controls.

The standards address both fine particles (PM2.5) and inhalable coarse particles (PM10). The previous daily fine particle standard is reduced by nearly 50% from 65µg/$m^3$ to 35µg/$m^3$. EPA is also retaining the current annual standard for long-term exposure to fine particles at 15ug/$m^3$. EPA is retaining the existing daily PM10 standard of 150µg/$m^3$ but is revoking the annual coarse particle standard because the available evidence does not suggest an association between

long-term exposure to coarse particles at current ambient levels and health effects. Based on recently updated benefits estimates, meeting this standard will result in benefits ranging from $20 billion to $160 billion a year.

## California Truck Idling Requirements

The California Air Resources Board has adopted new requirements to reduce idling emissions from new and in-use diesel trucks. The new rule becomes effective on 15 November 2006.

All new 2008 and subsequent model-year heavy-duty diesel engines must be equipped with a tamper-resistant system that automatically shuts down the engine after 300 seconds (5 minutes) of continuous idling operation once the vehicle is stopped, the transmission is set to "neutral" or "park", and the parking brake is engaged; or after 15 minutes if the parking brake is not engaged. Over-ride systems are allowed if the engine is operating in power take-off mode, if the coolant is below 60°F (15.5°C), during maintenance, or if an emission control device is regenerating. Heavy-duty diesel engines to be used in buses, school buses, medium-duty vehicles and military tactical vehicles are exempt. There is also an optional alternative to meet a NOx idling emission standard of 30g per hour or to fit an idling emission reduction device meeting specific requirements.

Auxiliary diesel engines used to comply with the idling requirements must either be equipped with a verified Level 3 in-use strategy for particulate matter control; or have their exhaust routed directly into the vehicle's exhaust pipe, upstream of the diesel particulate filter; or, with prior approval, use an alternate particulate matter control strategy.

## California proposes Emissions Limits for Stationary Agricultural Diesels

Califonia Air Resources Board (ARB) has proposed amendments to the Airborne Toxic Control Measures (ATCM) for in-use stationary diesel engines used in agriculture. The proposals, which ARB expects to be met through engine replacement, repowering or by retrofitting of wall-flow filters (ARB-verified Level 3 technology), will be based on off-road PM standards and will be phased in between 2011 and 2016.

## New Data Show a decline in Children's Exposure to Pollutants

New data released by the US Environmental Protection Agency (EPA) show that the percentage of children living in American counties that do not meet the air quality standard for fine particulate matter has declined from 24% to 16% between 1999 and 2004. The data come from an update to America's Children and the Environment, a compilation of information from federal databases.

## Vancouver orders Buses with Diesel Particulate Filters

TransLink, the public transportation authority for the Greater Vancouver area in Canada has ordered 126 city buses from Volvo Bus Corporation's subsidiary Nova Bus. The Nova LFS buses will be equipped with a particulate trap and are scheduled for delivery during 2007.

## US proposes Renewable Fuels Strategy

The US Environmental Protection Agency has proposed a Renewable Fuels Standard (RFS) Programme designed to double the use of renewable fuels such as ethanol and biodiesel. The programme will promote use of fuels largely produced by American crops, to reduce dependence on foreign oil.

The new regulation proposes that 3.71% of all gasoline sold or dispensed in 2007 be must renewable fuel. The default standard for 2006 under the Energy Policy Act is 2.78%. In 2006, there will be about 4.5 billion gallons of renewable fuel consumed as motor vehicle fuel in the United States. The RFS programme requires that this volume increase to at least 7.5 billion gallons by 2012. In addition to a preliminary analysis of the economic and environmental impacts, the proposal explains how industry is likely to comply with the RFS for 2007 and beyond. The system allows renewable fuels to be used where they are most economical, while providing a flexible means for industry to comply with the standard. Various renewable fuels can be used, including ethanol and biodiesel.

## Ultra-Low Sulfur Diesel is now widely Available in the US

From 15 October 2006 ultra-low sulfur diesel (ULSD) fuel has been widely available in the US. From that date 80% of highway diesel must meet the requirement of a maximum sulfur content of 15 ppm and refiners say that production levels are now at the level that will support 90% of current consumption. The date supports the introduction of new engine and emissions control technologies for 2007 model year trucks and has allowed some European light-duty vehicle manufacturers to launch diesel-powered vehicles meeting US Tier II Bin 8 requirements. These are expected to be followed for 2008 by vehicles meeting Tier 2 Bin 5.

## MIDDLE EAST

### Israel introduces Euro IV emissions limits

Press reports from Israel say that new regulations issued by the Israeli Transport Ministry call for diesel vehicles to meet the Euro IV standards. Based on the newly published regulation, the Ministry will only permit import of diesel commercial vehicles weighing 3.5 tonnes and over provided they meet the Euro IV emissions standards.

### Cairo's 'Black Cloud'

For the seventh year running, a black cloud has appeared over Cairo and emissions of $NO_2$ have reached record levels in the city triggering serious health concerns for the city's 16 million residents.

Cairo has one of the world's highest rates of pollution, ten times higher than global indicators defined by the WHO in October. NOx levels have reached 1.5 times the WHO-recommended maximum level in the Cairo district of Qolali; nearly 2.5 times the limit in Giza and even 3.5 times the WHO level in the northern city of Qaha, in the industrial zone of Qaliubiyah. Exhaust fumes from 1.6 million cars are suggested by authorities as one of the causes for the cloud, together with industrial pollution and burning of stubble to clear fields for new crops.

## ASIA-PACIFIC

### Asian Vehicle Emission Control Conference AVECC 2006 in Jaipur, India

The 3rd Asian Vehicle Emission Control Conference AVECC 2006 was held in Jaipur, India from 20 to 22 September 2006. Over 200 delegates attended the conference, with key-delegates from the Indian Ministries and research and industry organisations.

ECMA, AECCs sister organisation in India, did an excellent job in organising the conference, with assistance from MECA and AECC. Speakers included representatives from Indian legislative bodies as well as from ECMA, AECC and MECA members. Data was presented on Indian air quality needs and the technologies that help reduce emissions from mobile sources. The closing panel discussion with Indian policy makers indicated that low sulfur fuel is needed for the future to enable emissions control technologies. The Indian Bharat Stage IV (Euro 4) that is now scheduled to enter into force in major Indian cities in 2010 was discussed and it was noted that this BS IV could possibly be applied country-wide in 2010.

### Chinese Emissions Standards for 2007

The Chinese State Environment Protection Administration (SEPA) has confirmed the new vehicle emissions standards for 2007. The standard for light-duty vehicles will be equivalent to Euro 3 (including 0.5g/km of NOx and 0.05g/km PM for diesel cars; 0.15g/km NOx for petrol cars) and for heavy-duty the Euro III standard (including 5g/kwh NOx and 0.1g/kwh PM) will have to be met. SEPA plans to institute the Euro IV standard by 2010.

### Indian NGO criticises Vehicles and Fuels Road Map

The Indian Centre for Science and the Environment (CSE) has said that the inability of the Union government to decide the date for the early enforcement of tighter emissions restricts the scope of what cities can do to reduce pollution. The Centre says that the rationale for limiting the tighter standards to only a few big cities, set out in the Auto Fuel Policy roadmap, does not stand the test of reason any more.

CSE says that as many as 57% of the Indian cities monitored have critical PM10 levels (more than 1.5 times the standards). Newer and smaller cities are scaling the pollution peak and are more polluted than the big metros. These cities have rapidly growing vehicle populations but do not have the means to address the pollution challenge as a result of the roadmap. Keeping emissions standards lenient for the countryside is flooding smaller cities with outdated polluting technologies and fuels.

CSE notes that the Cabinet-approved Auto Fuel Policy had promised a review in 2006 to fix the date for the introduction of Euro IV emissions standards, but by October there was still no sign of a review.

### Concerns over night-time Truck Pollution in Calcutta

Litigation in the Calcutta High Court has brought into focus emissions from trucks entering the city during the night. A writ petition filed by an environmentalist claims that nearly 40 000 trucks enter the city every night. An expert committee had submitted a report on the issue to the Green Bench of the High Court stating that air pollution during the night is much higher than in day. The committee quoted a World Health Organization (WHO) report of 1995, which stated that the city had recorded 5726 cases of air pollution related premature deaths. The figure for hospitalisation of air pollution-related cases was 3 million in 1991-92.

### China reports Cities suffering from Severe Air Pollution

More than half of Chinese cities suffer from air pollution according to a report by the State Environmental Protection Administration (SEPA).

The report rated air pollution the major environmental problem for urban areas after assessing last year's

environmental conditions in 509 cities. According to the report, air quality in only 44.9% of cities was above Grade II, a national standard indicating a clean and healthy air environment. However, the figure was 12.6% higher than that for 2004. Forty-three cities, down by 9.9 percentage points, were put on SEPA's black list, with air quality below Grade III, meaning they suffered serious to very serious air pollution.

The report called for local governments to play a leading role in improving urban environment with officials' evaluation closely linked to their performance in pollution control. It said that local governments should also pay more attention to problems like floating dust and vehicle emissions, which the public has complained about a lot.

## South Korea to revise Air Quality Standards

South Korea is planning to bring its environmental standards for air quality more in line with US and European standards.

According to a proposal made public by the Environment Ministry, the enforcement decree of the Basic Environment Policy Act will be amended to raise air quality standards starting in January 2007. Cabinet approval was expected in September 2006. The changes to the air quality standards will include new restrictions on benzene levels in air. The air quality standard for particulate matter smaller than 10 microns in diameter (PM10), will be lowered from the current 70μg/m$^3$ to 50μg/m$^3$, matching the US standard. The standard for nitrogen dioxide ($NO_2$) will be lowered from 0.05ppm to 0.03ppm, approximating to the US standard.

According to the ministry's data, PM10 pollution in Seoul averaged 58μg/m$^3$ in 2005, while $NO_2$ content in the capital city averaged 0.034ppm.

## Study links Hong Kong Air Pollution to Childhood Asthma

Hong Kong's air quality may be responsible for a significant jump in children being admitted to hospital for asthma, a six-year study has found. The study was published in the June issue of the medical journal Clinical and Experimental Allergy.

Using hospital admission records in the years 1997 to 2002, researchers at the University of Hong Kong found that a total of 26 663 children were admitted to hospital for asthma during the six-year period. After days when pollutants such as nitrogen dioxide, ozone and respirable suspended particulates were especially high, the numbers of children admitted for asthma would rise by 13% on average, according to the study.

## Australian study links Sydney Air Pollution to Hospital Admissions of Elderly People

According to research published in the Journal of Exposure Science and Environmental Epidemiology[2], emergency department (ED) admissions for cardiovascular disease in the elderly are linked to ambient air pollution in Sydney, Australia.

The study aimed to determine associations between ambient air pollutants and ED attendances for cardiovascular disease (CVD) in those aged 65+ years. The researchers constructed daily time series of ED attendances, air pollutants and meteorological factors for Sydney metropolitan area from 1 January 1997 to 31 December 2001. They used generalised linear models to determine associations between daily air pollution and daily ED attendances and controlled for the effects of long-term trends, seasonality, weather and other potential confounders.

Increased ED attendances for all cardiovascular disease, cardiac disease and ischemic heart disease were seen with 24-hour particulate pollution, 1-hour $NO_2$, 8-hour CO and 24-hour $SO_2$. The effects of air pollutants on CVD, cardiac disease and stroke attendances were generally greater in the cool period compared to the warm period. The single-pollutant effects were essentially unchanged in two-pollutant models. The authors concluded that although air pollution levels in Sydney are relatively low compared to similar cities, they have demonstrated associations between ambient air pollutants and ED attendances for CVD in people aged 65+ years.

[2] Jalaludin et al, Associations between ambient air pollution and daily emergency department attendances for cardiovascular disease in the elderly (65+years); Journal of Exposure Science and Environmental Epidemiology, 2006;16(3):225-237.

## Taipei Study links Cerebrovascular Hospital Admissions to Air Pollution

An investigation recently published in the European Heart Journal[3] reports that emergency admissions for cerebrovascular diseases among adults were positively associated with increasing urban air pollution levels in Taipei.

Daily emergency admissions for cerebrovascular diseases were compared with daily concentrations of CO, $NO_2$, $SO_2$, ozone, PM2.5 and PM10 in Taipei metropolitan areas from 12 April 1997 to 31 December 2002. Single-pollutant models showed that ozone on the day of admission (i.e. lagged by 0 days), CO lagged by 2 days, and PM2.5 and PM10 lagged by 3 days, were significantly associated with increasing emergency admissions for cerebrovascular diseases; CO lagged by 2 days was significantly associated with increasing emergency admissions for

strokes. The association remained significant for ozone, CO, and cerebrovascular admissions after adjusting for PM2.5 and PM10 in two-pollutant models, but only CO was significantly associated with emergency admissions for stroke in the three-pollutant models with CO, ozone and PM2.5 or PM10.

[3] Chan et al., Urban air pollution and emergency admissions for cerebrovascular diseases in Taipei, Taiwan; European Heart Journal, 2006;27(10):1238-1244.

## Chinese Government outlines Greener Transport Fuels Policy

Half of China's cars will use fuels other than petrol including diesel, hydrogen and bio-fuels by 2025, according to the director of the industrial economics research department with the Development Research Centre of China's State Council.

Speaking at a recent seminar, he dismissed diesel refined from coal as a major alternative to petrol, due to its low energy efficiency and high $CO_2$ emissions in the production process. 3 to 5 tonnes of coal is needed to produce 1 tonne of diesel, bringing overall energy consumption to 2-3 times that of petrol cars.

# GENERAL

## German Study links Cardiovascular Effects with Vehicle Pollution

A study published in the journal Epidemiology[4], has analysed the effects of particulate air pollution on the cardio-vascular condition of older women living near busy roads in North Rhine-Westphalia in Germany.

The researchers, from Germany's National Research Centre for Environment and Health and Environmental Health Research Institute, concluded that women living within 100 metres of highly frequented roads are 79% more likely to develop chronic obstructive pulmonary diseases (COPD). This is the first time there has been a long-term, statistical analysis in Germany of such a relationship between disease and air pollution from vehicles.

From 1985 to 1994, the scientists studied the effects of air pollution on the health of women aged 55. Then, between 2002 and 2005 researchers reviewed the data from 4800 of the subjects for details on mortality, on chronic respiratory diseases and on their pulmonary function. They discovered that 3% of the study group died from cardiopulmonary causes. Associations were found between cardiopulmonary mortality and living within a 50 metres distance from busy roads, where the mortality was 70% higher. With respect to the PM10 annual mean, cardiopulmonary mortality rose by 34% per 7µg/m³. For $NO_2$ the increase was 57% per 16µg/m³. All results were statistically significant. Respiratory diseases and reduced pulmonary function were most strongly associated with PM10 and traffic-related pollution. An increase of PM10 by 7µg/m³ was associated with an increase in the prevalence of COPD by 33% and living within a 100m distance from highly frequented roads with an increase by 79%.

The researchers argue that between 4500 and 22000 premature deaths per year could be avoided if air quality legislation was tightened. They are amongst the signatories of a declaration calling for strong EU legislation to limit concentration of particles in the air.

[4] Gehring et al: Long-term exposure to ambient air pollution and cardiopulmonary mortality in women. Epidemiology, 2006 Sept 17(5): 545-51

## WHO sets Global Air Quality Standards

The World Health Organisation has published the first ever global air quality guideline standards for PM, ozone, $NO_2$ and $SO_2$ and has called for worldwide action to reduce air pollution.

In addition to guideline values, interim targets are given for each pollutant. These are proposed as steps in a progressive reduction of air pollution, intended for use in areas where pollution is high. WHO says that progress towards the guideline values should, however, be the ultimate objective of air quality management and health risk reduction in all areas.

Several of the guideline standards are stricter than similar WHO guidelines for Europe published in 2000. The recommendations include an annual PM10 standard of 20µg/m$^3$ – WHO says that in many cities, the average annual levels exceed 70µg/m$^3$, but reducing levels of PM10 could reduce deaths in polluted cities by as much as 15% every year. Other guidelines for particulate matter are a 50µg/m$^3$ 24-hour mean for PM10 and a 10µg/m$^3$ annual mean and 25µg/m$^3$ 24-hour mean for PM2.5. The table below shows the interim targets for 24-hour PM standards.

**WHO air quality guidelines and interim targets for particulate matter: 24-hour concentrations[a]**

| | $PM_{10}$ (µg/m³) | $PM_{2.5}$ (µg/m³) | Basis for the selected level |
|---|---|---|---|
| Interim target-1 (IT-1) | 150 | 75 | Based on published risk coefficients from multi-centre studies and meta-analyses (about 5% increase of short-term mortality over the AQG value). |
| Interim target-2 (IT-2) | 100 | 50 | Based on published risk coefficients from multi-centre studies and meta-analyses (about 2.5% increase of short-term mortality over the AQG value). |
| Interim target-3 (IT-3)* | 75 | 37.5 | Based on published risk coefficients from multi-centre studies and meta-analyses (about 1.2% increase in short-term mortality over the AQG value). |
| Air quality guideline (AQG) | **50** | **25** | Based on relationship between 24-hour and annual PM levels. |

Other standards include $NO_2$ guidelines of 40µg/m$^3$ annual mean and 200µg/m$^3$ 1-hour mean, an eight-hour mean ozone limit of 100 µg/m$^3$, (compared with 120 µg/m$^3$ in the European guidelines) and a 24-hour $SO_2$ standard of 20µg/m$^3$ maximum, compared with 125ug/m$^3$ in the 2000 standards.

## Declaration on Manganese in Fuel

Following an International Workshop on Neurotoxic Metals held in June by the Scientific Committee on Neurotoxicology and Psychophysiology and the Scientific Committee on the Toxicology of Metals of the International Commission on Occupational Health (ICOH) a declaration on the prevention of the neurotoxicity of metals (The Brescia Declaration) is to be published in a special edition of the American Journal of Industrial Medicine.

The declaration deals with lead, mercury and manganese. On leaded petrol, the declaration says that tetraalkyllead must be eliminated "without delay" from the gasoline supplies of all nations. The removal of lead from gasoline has produced declines in population mean blood lead levels of over 90% in industrially developed nations. This action represents one of the great public health triumphs of the late 20th century and urgently needs extending to all nations.

The declaration then goes on to deal with manganese, where it says that "the addition of organic manganese compounds to gasoline should be halted immediately in all nations. The data presented at the Brescia Workshop raise grave concerns about the likelihood that addition of manganese to gasoline could cause widespread developmental toxicity similar to that caused by the worldwide addition of tetraalkyllead to gasoline. In light of this information, it would be extremely unwise to add manganese to gasoline".

## Honda launches new Diesel NOx System

Honda says it has developed a next generation diesel engine that could reduce emissions to gasoline engine levels and meet US Tier 2, Bin 5 without using urea.

Honda's system is described as a three stage technology using a two-layer catalytic converter. In the lean-burn mode, NOx is absorbed by platinum in the lower layer of the catalytic converter then, when needed, the engine management system briefly switches the air-fuel ratio (AFR) to rich mode, producing more hydrogen in the exhaust. The absorbed NOx then reacts with the hydrogen to form ammonia. The converter's upper layer temporarily absorbs the ammonia so that when, after a few seconds, the engine returns to lean-burn mode, the ammonia reacts with NOx to reduce it to nitrogen. Honda has said it will launch clean diesels in the United States and Japan within three years.

## Asthma Symptoms linked to Soot Particles from Diesel Trucks

Soot particles from the exhaust of diesel trucks constitute a major contributor to the alarmingly high rates of asthma symptoms among school-aged children in the South Bronx, according to the results from a study by researchers at New York University's School of Medicine and Robert F. Wagner Graduate School of Public Service.

Ten elementary school children with asthma from each of four schools were followed for a month. Data on respiratory symptoms, lung function, activity patterns, as well as personal air pollution exposures were collected at the same time. As part of the investigation, a mobile lab was used to assess ground-level pollution and a "Backpack Study" was conducted to monitor carbon concentrations taken from air samples collected by commuting students. The researchers say that the findings have shown that high concentrations of air pollution worsen asthma problems among elementary school children.

According to the study, among all of the children the daily average exposure to particulate matter smaller than 2.5 microns (PM2.5) ranged from 20 to 50µg/m$^3$. In addition, the US Environmental Protection Agency's proposed daily limit of 35µg/m$^3$ was exceeded on about one-third of the study days. The researchers say that only about 10% of the total mass of tiny particles was diesel soot, but it was this portion that was most closely related to children's adverse health effects. They report that the major type of air pollutant that was associated with symptoms of asthma was elemental carbon, which is found in diesel exhaust and is a component of PM2.5 particulate matter. This type of carbon has been cited as a causal agent in asthma in a number of other controlled-exposure studies in the laboratory.

Further details are given at:
http://www.med.nyu.edu/communications/news/pr_204.html

## Vehicle Pollution linked with Increased Risk of Heart Attacks

Pollution from automobile traffic is linked with a significantly increased risk of heart attacks, according to a study[5] published by researchers from the Harvard School of Public Health, Beth Israel Deaconess Medical Center, and University of Massachusetts Medical School. According to the study, an increase in traffic near the home was associated with a 4% increase in the risk of having a heart attack, and living near a major road was associated with a 5% increase.

The research team analysed estimated pollution levels near the homes of 5049 people who had heart attacks between 1995 and 2003 and compared that information to pollution levels experienced by 10 277 people who did not have a heart attack.

[5] Tonne et al, A Case-control Analysis of Exposure to Traffic and Acute Myocardial Infarction; Environmental Health Perspectives, doi:10.1289/ehp.9587

## FORTHCOMING CONFERENCES

**Small Engine Technology Conference**

13-16 November 2006, San Antonio, Texas, USA

*The conference theme is Future Trends in Small Engine Technology to Satisfy Long-Term Demands and topics include advanced combustion, environmental impacts and HCCI. There are three sessions on emissions.*

**IFQC Technology & Policy Briefing**

16 November 2006, Paris, France

**Spark Ignition Engine Emissions (short course)**

20-24 November 2006, Leeds, UK

Details at http://www.engineering.leeds.ac.uk/cpd

*The course covers emissions and combustion fundamentals; sources of emissions in SI engines; catalytic control of emissions; fuel composition effects; and future engine design for low emissions.*

**Reducing Transport's Energy Use**

21 November 2006, London, UK

Details at http://www.thewaterfront.co.uk/conferences/conf_calendar%20trans%20energy.php

*This one-day conference will focus on the transport proposals put forward in the UK Government's Energy Review, looking at the developments and partnerships needed in order for the Government to meet its targets.*

**Global Harmonisation of Motor Vehicle Regulation - a major opportunity?**

28 November 2006, Brussels, Belgium

More from: Forum for the Automobile & Society at www.autoandsociety.com

**Symposium on International Automotive Technology (SIAT2007)**

17-20 January 2007, Pune, India

Details at: http://www.araiindia.com/html/SIAT2007.jsp

*Topics include engine and powertrain, emissions (Euro 3 and beyond), emissions inventory and ambient air quality, inspection and maintenance programmes and global harmonisation of standards.*

**SAE Fuels and Emissions Conference**

23-25 January 2007, Cape Town, South Africa

Details at http://www.sae.org/events/sfl/cfp.htm

**5th International CTI Forum Exhaust Systems**

29-31 January 2007, Nürtingen, Germany

Details at www.abgastechnik-forum.com

*The forum will cover exhaust aftertreatment for diesel engines and spark ignition, future emissions legislation, liquid and solid urea SCR-systems, diesel particulate filters, in-engine emissions reduction and particulate and soot measurement technology.*

**MinNOx - Minimization of NOx Emissions through Exhaust Aftertreatment**

1-2 February, 2007, Berlin, Germany

Details at http://www.iav.de/eng/4_events/iav_conferences.php

*A significant reduction in NOx emissions from light and heavy-duty diesel engines will be mandatory as a result of upcoming emissions limits in Europe, the US and Japan. The conference committee calls for papers focused on SCR for passenger cars and heavy-duty, Lean NOx traps; Diagnostics and Simulation of DeNOx systems.*

**8th International Congress on Engine Combustion Process**

15-16 March 2007, Munich, Germany

*Topics include HCCI, innovative engine combustion concepts, injection systems, alternative engine concepts, fuels and exhaust gas aftertreatment plus topics in modern experimental techniques and simulation.*

**International Conference on Transport and Environment: a global challenge, Technological and Policy Solutions**

19-21 March 2007, Milan, Italy

*First announcement of a conference that DG JRC and Regione Lombardia are jointly organising, on the issue of Transport and Environment and as a follow-up of the successful EURO-V Conference, which took place in Milan in December 2003. Themes that will be treated relate to environmental impact of transport, such as the Euro 5 and Euro VI emissions standards for LD and HD vehicles, the new Directives on fuels and air quality standards, the biofuels promotion strategy.*

**VDA Technical Congress 2007**

28-29 March 2007, Sindelfingen, Germany

*The congress will deal with the topics of 'Environment and Energy' and 'Vehicle Safety & Electronics'.*

**FINE! Dust-free into the future: International Final Congress on the EU-LIFE-Environment Project KAPA GS**

29-30 March 2007, Klagenfurt am Wörthersee, Austria

More info from http://www.feinstaubfrei.at

*KAPA GS is a PM10 Action Programme co-financed by the EU. Initiatives to reduce particulate emissions at a local level are simulated in a computer model, tested on site and then adapted for permanent application. Measures that have been evaluated in the course of the project will be presented.*

**SAE 2007 World Congress**

16-19 April 2007, Detroit, Michigan, USA

Details at http://www.sae.org/congress/techprogram/cfp.htm

**Additives 2007: Applications for Future Transport**

17-19 April 2007, London, UK

Details at http://www.rsc.org/ConferencesAndEvents/RSCConferences/Additives2007/index.asp

*Targets for exhaust emissions, fuel economy and vehicle recyclability have to be accompanied by increased engine durability, extended lubricant drain intervals and improvements in vehicle performance and refinement. This conference will focus on the developments of fuel and lubricant additive technology in meeting these challenges.*

**Dustconf 2007, How to improve air quality**

23-24 April 2007, Maastricht, the Netherlands

*The conference will address practical approaches to tackle emissions of particulate matter from industrial, agricultural and domestic stationary sources. DustConf 2007 focuses on reduction technologies and practical reduction policies and EU-directive implementation methods for stationary sources in industry and agriculture. The conference will primarily focus on PM10/2.5 or the respiratory aerosols. It will aim at providing information about practical approaches to tackle emissions of fine particles to improve local air quality.*

**28. Internationales Wiener Motorensymposium**

26-27 April 2007, Vienna, Austria

**4th AVL International Commercial Powertrain Conference**

9-10 May 2007, Graz, Austria

*The conference program includes a technical session on Exhaust Gas Aftertreatment.*

**EAEC 2007: 11th European Automotive Congress**

30 May - 1 June 2007, Budapest, Hungary

Details at http://www.fisita.com

*The conference will include themes on powertrain technology, vehicle and laboratory procedures, homologation/regulation and harmonisation in Europe.*

**9th VDI International Forum Trucks and Buses:** Solutions of Transport Efficiency, Reliability and Sustainable Environment

14-15 June 2007, Munich, Germany

Announcement and call for papers; abstracts due by 17 November 2006.

*Details at:* www.vdi.de/trucks-buses

**GPC 2007 World Powertrain Expo and Congress**

17-19 June 2007, Berlin, Germany

Details at http://www.gpc-icpem.org

**JSAE / SAE Fuels and Lubricants meeting**

23-27July 2007, Kyoto, Japan

Details at http://www.jsae.or.jp/2007fl/

*Sessions are planned on combustion, emissions, fuels, lubricants, and measurements and testing.*

**11th ETH Particles Conference**

20-22 August 2007, Zurich, Switzerland