

NAECCewsletter

Association for Emissions Control by Catalyst

Av. de Tervueren 100, B-1040 Brussels

Affiliated to CEFIC

September – October 2003

INTERNATIONAL REGULATORY DEVELOPMENTS

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EUROPE

1. Commission starts development of Future Emission Standards

The EU started the process of developing new EU V standards for light duty vehicles and EU VI for heavy duty engines at a September meeting at the Joint Research Centre at Ispra in Italy.

The Commission's intent is to produce a proposal in Spring 2005 for adoption in April 2005 (light duty EU V) and November 2005 (heavy duty EU VI). Some Member States voiced the opinion that a proposal for EU V is needed by the end of this year or the start of next year.

For the European Commission, DG Enterprise stated that EU V Light Duty targets could include:

- a reduction in tailpipe limits,
- diesel & DI petrol engine nanoparticles,
- HC species and limits appropriate to alternative fuels,
- durability beyond 160 000 km,
- in time, additional evaporative controls,
- revisions to test procedures – especially with regard to the contribution of mobile air conditioning to CO₂,
- possibly a role for Environmentally Friendly Vehicles (EFVs)
- better measures on off-cycle emissions.

For EU VI for Heavy Duty, the key issue was seen as NO_x and whether it could be reduced to 1.0g/kWh. Related to this it was suggested that controls may be needed to ensure the correct use of SCR systems.

The group met again in Brussels on 27 October, when the discussion covered initial positions on the Commissions 'key issues' and Member States' positions on whether there should be a 'fast track' approach to enable incentivisation of Diesel Particulate Filters. A number of

Member States favour such an approach, which might set interim limits before the full EU V package is agreed.

There was some discussion as to whether both durability and in-use compliance requirements are necessary. Fuel specifications were discussed briefly and there was a suggestion that if any vehicle recommends or permits running on biodiesel then the directives should require it to be tested on 100% biodiesel as such fuels might increase NO_x emissions.

2. Draft ECE Protocols for Particle Mass and Number Measurement

The PMP working group of the United Nations GRPE has produced its report on the Particulate Measurement Programme. In addition draft protocols for measurement of both particle number and mass have been prepared in the form of draft amendments to the ECE Regulations.

As expected, the PMP report proposes a modified US 2007 procedure as the best option for improved particulate mass measurement and use of a CVS + CPC (Condensation Particle Counter) + thermodiluter system as the best option for particle number measurement.

The drafts for amendments to ECE regulations 83 (light duty vehicle emissions) and 49 (heavy duty engine emissions) do not specify CPC and thermodiluter, but define the performance requirements for a number measurement system. These can currently be met by CPC + thermodiluter. The procedures would, if adopted, apply to all technologies – i.e. gasoline as well as diesel engines.

A 'drafting group' will develop these proposals further, with the objective of reaching an agreed procedure by the January 2004 GRPE meeting. In addition,

the UK will lead planning of a 'round robin' test to examine the capability of advanced technologies and vehicles for use in establishing new limits.

3. Swiss Proposals for Particulate Mass & Number Emission Limits

In a paper at the ETH conference, the Swiss Environment Agency, Bundesamt für Umwelt, Wald und Landschaft (BUWAL) revealed Swiss proposals for lower particulate mass limits and for new limits on particle numbers.

The EU IV limit for PM for diesel cars is 25mg/km, but BUWAL say that an EU IV car with Diesel Particulate Filter (DPF) can achieve <0.5mg/km. BUWAL therefore proposes, for diesel cars only, a PM limit of 5mg/km (0.005g/km). For particle numbers without a DPF typical figures are 10^{14} particles/km, but with a DPF they are 10^{10} particles/km. Therefore BUWAL proposes a limit of 10^{11} particles/km.

BUWAL believes that these limits should be adopted in European standards. However, Switzerland is considering ways to implement these limits, including an obligation for new cars from 2006/7. For heavy goods vehicles, Switzerland say they will negotiate with the EU to ensure that DPF-equipped vehicles go into the lowest long distance tax category.

4. Motorcycle Test Cycle Definition

Directive 2003/77/EC has been published. This directive defines the test cycles for the 2003 and 2006 motorcycle requirements. These were previously only defined by reference to ECE R.40. For 2003 two preconditioning urban cycles are followed by 4 measured urban cycles; for 2006 all 6 urban cycles are measured. In addition there is an extra-urban cycle for machines of over 150cc.

5. Revised Directive on OBD and Replacement Catalysts

Directive 2003/76/EC amends the requirements for OBD for gas-fuelled & bi-fuelled vehicles. It also modifies the requirements for the type-approval of replacement catalytic converters. This will enable a replacement catalytic converter that is already type-approved as original equipment or as an original replacement catalytic converter to be type-approved without repeating the verification tests.

6. Gaseous and Particulate Emissions from Non-Road Mobile Machinery

The European Parliament has reached agreement with the Council on the emission of gaseous and particulate pollutants from non-road mobile machinery (NRMM). As a result Parliament adopted at the first reading a legislative resolution to amend existing legislation on the subject.

The proposal aims to introduce new lower emission standards for NRMM and to extend the scope of the current Directive 97/68 to include engines in inland waterway vessels and trains. The compromise now reached between Parliament and Council provides for a gradual reduction in NOx and PM emissions until 2014 so that in the final step Diesel Particulate Filter technology would be needed.

Stricter emission limits would bring EU legislation into line with that of the United States. Emission limits for locomotives will be subject to a Commission review not later than 31 December 2007 to re-assess non-road emission inventory estimates and specifically examine potential cross-checks and correction factors.

7. New Insights into Health Effects from Air Pollution

The Flemish Scientific Group for Environment and Health, WVMG, organized a round-table 'Health and Environment in Flanders and Europe' in October. The research group around Prof. Benoit Nemery from Leuven University (KUL) reported on new insights on health effects from air pollution.

Prof. Nemery said that recent epidemiological research has demonstrated that health effects from urban air pollution relate not only to respiratory pathology but also, and even more, affect cardiovascular injuries. Experimental research has demonstrated that ultrafine particles (<0.1µm) can reach the bloodstream from the lungs and that Diesel Exhaust Particles (DEP) have prothrombotic effects.

Data was also presented from new research on cardiovascular effects of inhaled particles. This described possible mechanisms on systemic translocation and prothrombotic effects. Results show that DEP produce lung inflammation and aggravate thrombosis, findings that were substantiated in in-vivo, ex-vivo and in-vitro observations. The researchers believe that these observations have contributed to provide long-awaited experimental support and a plausible explanation for epidemiological studies that show that particulate air pollution increases cardiovascular morbidity and mortality.

8. High Ozone Levels in Europe

Record ozone levels were recorded during August's hot, still weather in Europe.

As a result health warnings were issued to asthmatics and the elderly, and speed restrictions were introduced in France and Luxembourg to try to reduce ozone

formation.

The sunshine, the high temperatures, lack of air movement and nitrogen oxides and hydrocarbon emissions from car traffic and industry favour the formation of ozone.

9. Spanish Council sets National Plan for Fighting Pollution

Spain's Council of Ministers (Cabinet) has announced a national plan for fighting air pollution, acid rain, and ozone concentrations and established a national climate change office.

The emissions reduction strategy, with the required reduction target goal of 2010, will focus on transportation, industry, agriculture, and the energy sector. The largest reduction requirement is applied to VOCs; Spain must reduce VOC emissions by 57% to 875 kilotonnes. In addition to placing emissions limits on industrial solvents, the government has said it will promote cleaner fuels and fuel efficiency in the transportation sector - the main source of VOC emissions.

In the area of transportation, the Spanish government said several measures could be used including promoting the purchase of less-polluting vehicles, introducing cleaner fuels, training motorists to have more fuel-efficient driving habits, offering tax incentives for "more environmentally efficient" transportation, and promoting the purchase and maintenance of low-emissions public bus fleets. For transporting goods, the government proposes promoting greater railway usage and improved management of the national highway network.

10. Diesel Particulate Filters at the Frankfurt IAA Motor Show in September

The Frankfurt Motor Show hosted announcements of Diesel Particulate Filter (DPF) fitment from most of the German car manufacturers.

DPFs were shown by Audi, Volkswagen, BMW, Mercedes Benz, Opel, Renault, Ford, Citroën and Peugeot. PSA also showed their well-know DPF system (FAP) on a buggy concept.

Toyota showed their DPNR (Diesel Particulate and NOx Reduction) system on the new Avensis. Some Tier-1 suppliers, notably Bosch and Eberspächer, also showed DPF systems.

11. Switzerland to Introduce 10ppm Sulphur Fuel

Switzerland will introduce a new tax on petrol and diesel fuels containing over 10 parts per million (ppm) sulphur on 1 January 2004.

The Swiss government has expressed confidence that sulphur-free motor fuels will rapidly take over the whole of its market once the new tax is in place.

12. Stakeholder Workshop on Low-Emission Shipping

The European Commission hosted a stakeholder workshop on Low-emission Shipping on 4 and 5 September. The first day covered research, abatement technologies and best practice, and the second covered market-based instruments. The session on technologies for reducing emissions of SO₂, NOx and particulate matter included use of low sulphur fuel, sea water scrubbing, Selective Catalytic Reduction and EGR.

13. France announces 'Clean Vehicle' Programme

The French government has announced a 'clean vehicle' programme, which includes alternative fuels, hybrids and retrofitting for trucks and buses.

The ADEME programme will undertake a 3 year, 3 M€ programme to fit up to 1000 urban trucks of 12 to 16 tonnes and less than 10 years old with particulate filters. ADEME will also oversee an incentives programme in 2004 to fit 350 old generation buses with particulate filters with active regeneration and to use low sulphur diesel at a cost of 1500 €/vehicle. A further programme will encourage the purchase of clean diesel buses with particle filters or natural gas buses.

14. Leaded Petrol has Virtually Disappeared from the EU

Figures from Eurostat show that unleaded petrol accounted for 98.89% of EU deliveries in 2002, up from 95% in 2001. The highest remaining sales volume was in the UK, but even there it amounted to only 0.27% of the UK market.

15. EC releases Report on External Costs of Transport

The European Commission has published a report on the socio-environmental cost of different methods of transport and electricity generation. The results could be used to tax the most damaging fuels and technologies or to encourage those with lower socio-environmental costs.

The external costs take into account tailpipe emissions, pollution from fuel production, and the environmental impacts of vehicle production and infrastructure building. The report concludes that electric trains are by far the most environmentally

friendly option, with the interurban coach second. Diesel cars scored poorly due to high air pollution costs attached to particulate matter emissions. Diesel urban buses had lower cost per passenger per kilometre (pkm) than gasoline cars in all cities except London.

In cities with unfavourable climate conditions (e.g. Athens) the air pollution costs for diesel cars were almost €5 per 100 pkm. Under more favourable conditions of Amsterdam, the costs for diesel and gasoline cars were similar, both below €1 per 100 pkm. In extra-urban driving the costs were from less than €0.2 to about €1.2 per 100 pkm, due to low population exposure to pollution.

In goods transport, the highest external cost was calculated for heavy goods vehicles followed by container ship, barge, and goods train. The pollution component, however, from heavy goods vehicles was actually less than that from the container ship and barge (but higher than from the train). The highest external cost component in heavy-goods vehicles was accidents.

16. Integrating Environment into Transport Policy

The EU's Directorate General for Environment has recently published a 'sourcebook' on the integration of environmental issues into transport policy. The content covers infrastructure, congestion and land use related to transport, but there are also sections directly related to emissions, including issues such as emissions-related charging.

NORTH AMERICA

17. US Smog Levels worsen in 2002

New data show that 2002 was the worst smog season in recent years, according to a

new Clear the Air report released by US Public Interest Research Group (PIRG).

"Danger In The Air: Unhealthy Levels of Smog In 2002" is the fourth annual compilation of data from over 1 000 ozone monitors. There were 8 818 instances in 2002 when ozone exceeded the national standard, a 90% increase over 2001. Ozone monitors in California, Texas, and along the Eastern seaboard recorded 55 exceedences falling within the 'very unhealthy' range. Every region of the country exceeded the standard more often in 2002 than 2001.

18. EPA Study recommends Tightening Airborne Soot Limits

A draft Environmental Protection Agency report says new federal health standards for soot in air should be tightened as they do not adequately protect the elderly and people with respiratory problems.

The draft paper says that since 1997, some scientific studies "have confirmed and strengthened" the association between exposure to microscopic soot and premature deaths, cardiovascular problems, and respiratory illnesses. In many cases these studies showed adverse health effects when airborne soot concentrations were well below the maximum allowed by the 1997 standard ($65\mu\text{g.m}^{-3}$ 24 hour standard; $15\mu\text{g.m}^{-3}$ annual average).

As a result, it is recommended that the allowable concentrations be reduced to 30 - $50\mu\text{g.m}^{-3}$ for the 24 hour standard and $12\mu\text{g.m}^{-3}$ for the annual average.

The findings could become the basis for additional pollution-control requirements to reduce the amount of soot emitted by diesel-burning trucks, cars, factories, and power plants.

19. EPA will not regulate Motor Vehicle Greenhouse Gases

The EPA has issued a notice denying a petition from the International Centre for Technology Assessment and a number of environmental organizations to regulate greenhouse gases from motor vehicles.

EPA says that Congress has not granted EPA authority to regulate greenhouse gases for climate change purposes under the Clean Air Act, and setting greenhouse gas emission standards for motor vehicles "is not appropriate at this time".

20. EPA proposes Tighter Emission Standards for Aircraft

The US Environmental Protection Agency has proposed that by 2004 new commercial aircraft engines used in the United States must comply with international standards for emissions of nitrogen oxides.

The standards will implement the NOx emissions standard of the UN International Civil Aviation Organization (ICAO). It would apply to new US aircraft engines used on commercial aircraft ranging from small regional jets to 747s and other larger aircraft. General aviation and military aircraft using commercial aircraft engines are also subject to this proposal.

21. CARB releases Children's School Bus Exposure Study

Recommendations from a study to assess children's exposure to diesel vehicle pollutants during their journeys to school include replacing conventional diesel school buses with natural gas-powered or particulate trap-equipped buses.

The Children's School Bus Exposure Study measured pollutant concentrations inside and outside five conventional diesel school buses while driving actual school bus

routes in Los Angeles. For comparison, a diesel bus equipped with a particulate trap and a bus powered by natural gas were also included. A tracer gas was used to determine the buses' own contributions to on-board concentrations.

Measurements indicated that for some buses, exposures to vehicle-related pollutants during the journey were significantly higher than roadway pollutant concentrations alone would indicate. Influences included other vehicles being followed and the bus's own emissions. The extent of a bus's own contribution to these appeared to be highest when windows were closed for the older diesel buses, but bus-to-bus variability was high.

Recommendations from the report include:

- assigning the newest and cleanest buses to the longest routes.
- Staggered departure times to avoid convoys.
- Replacing conventional diesel school buses with natural gas-powered or particulate trap-equipped buses.
- Maintaining diesel school buses to reduce visible exhaust.

22. 2002 US Air Quality Trends

The annual air trends report of the US Environmental Protection Agency (EPA) shows a steady and significant air quality improvement.

The report shows that since 1970 emissions of the six principle air pollutants (carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulphur dioxide) have been cut by 48%. During that time, US energy consumption increased by 42%, vehicle miles travelled increased by 155% and gross domestic product increased by 164% percent.

The vast majority of areas that experienced unhealthy air did so because of ozone and/or particulate matter (PM). Of the six tracked pollutants, progress has been slowest for ground-level ozone.

ASIA-PACIFIC

23. South Korea encourages Environment-Friendly Cars

A new draft law would require the South Korean Ministry of Commerce to develop plans to encourage hybrid engine and fuel cell technologies.

It also would set certification criteria for environment-friendly cars including those using electricity, solar power, compressed natural gas and hydrogen. These vehicles would have to meet more stringent emissions and energy efficiency standards than conventional cars.

The draft of the "Law on the Promotion of the Development and Adoption of Environment-Friendly Vehicles" is due to be submitted to the National Assembly for approval during this year. The Ministry will then issue detailed rules and regulations during the first half of 2004.

The central and local governments would provide financial and technical support for the industry and would have the power to impose quotas on government agencies and businesses for purchasing environment-friendly cars, according to the draft legislation. Consumers would be given tax incentives for buying such vehicles.

The planned incentives will be made more effective by disincentives for diesel cars, including higher diesel fuel prices. Currently, diesel fuels are about 40% cheaper than gasoline in South Korea, fuelling the popularity of diesel-powered

sport utility vehicles and minivans. Domestic sales of diesel cars, currently banned for environmental reasons, will be liberalized in 2005.

24. Tokyo Emission Standards for Diesel Trucks go into effect

On 1 October, the Tokyo municipal government and 3 neighbouring prefectures began phasing out diesel-powered commercial motor vehicles that fail to meet tougher new emission standards aimed at reducing suspended particulate matter.

Bus and truck owners will have to either replace their old vehicles with new low-emissions types or fit their old ones with diesel particulate filters and oxidation catalyst devices. The rules apply only to vehicles in use for seven years or more.

25. Japan's Hino markets small Truck with Particulate Filter

Hino Motors Ltd has begun selling a small truck that meets the Japanese 2005 diesel gas emission standards.

Hino combined an advanced diesel particulate filter with a low-emission diesel engine and installed the system in the Dutro two-ton-class light duty truck. Hino say that some 95% of the particulate matter and 100% of the soot is removed in the process. Using the same technology, Hino plans within the year to release a 4 ton standard size truck.

The model is sold for 3.12 million yen, which is 180 000 yen more than a version without the emissions reduction system.

26. China applies EU II Emission Standards on Heavy Trucks

From 1 September 2003 the Chinese Government requires all heavy duty vehicles (>3.5 tonnes) to comply with the

EU II emission standard nationwide before they can be manufactured, imported, sold or registered in China.

EU II for light duty vehicles will be implemented nationwide from 1 July 2004.

27. China working on New Standard for Gasoline Additives

China is drawing up a national standard on "fourth generation" gasoline combustion chamber detergents.

Under the Hazardous Materials Control Standard for Motor Vehicle Gasoline, (GWKB1-1999), all motor vehicle gasoline in China must contain some type of cleaning agent, as locally produced fuel tends to contain a high level of olefins.

The most common additives used in China now are the second or third-generation products, (injector or intake valve cleaners), neither of which are totally effective for Combustion Chamber Deposits (CCDs).

28. Sinopec to offer Lower Sulphur Diesel Fuel in China

The Chinese oil company Sinopec has announced that it will voluntarily make available a lower sulphur (500ppm) diesel fuel for cities starting on 1 October 2003.

29. Indonesia introduces EU II Standards

The Indonesian Minister of Environment has signed a decree requiring all new vehicles to have EU II standard technology by 2005.

It reflects some bargaining with the automotive industry, however, which provides additional flexibility. Specifically, new type models are changed every 5-8 years, and Toyota will introduce a new model this year with technology

geared to leaded gasoline and high sulphur diesel. This means that Toyota - which has 80% of the car market - will not update to the EU II engines until around 2007.

30. New Zealand planning Vehicle Emissions Testing Scheme

New Zealand is to establish regular in-service emissions testing for all road vehicles, and will also require that second-hand imported vehicles be emission screened at the New Zealand border to ensure they meet minimum emissions standards as they enter the country. The government expects the new system to be in place by the latter half of 2006.

31. New Zealand exempts Ethanol Fuel Blends from Tax

Ethanol-gasoline blends in New Zealand are to be free from excise duty for a period of at least two years.

The new measure will contribute to reductions in climate change emissions. It was prompted by the desire to use the 6 to 11 million litres of renewable ethanol produced annually by the New Zealand dairy industry. The Environmental Risk Management Authority approved the use of up to 10% ethanol in gasoline blends in August. The Energy Efficiency and Conservation Authority (EECA) is compiling a list of motor vehicle types that can use the blend.

32. India Decides on National Fuels Policy to Curb Pollution

The Indian government has issued an emissions roadmap with a national policy on fuel.

The policy sets an April 2010 deadline to ban the sale of any vehicle that does not meet EU III emission standards. For 11 major cities, including New Delhi, the

deadline has been accelerated to April 2005. These cities will further be required to meet the higher EU IV standard by 2010.

The proposal will be presented to Parliament in December, where it is likely to be enacted. Current estimates indicate that motor vehicles are the biggest cause of air pollution in most of India's urban centres. For instance, the Central Pollution Control Board has estimated that vehicles contribute about 72% of the ambient air pollution in New Delhi.

GENERAL

33. Catalyst Research Medal

Robbie Burch, a senior professor at Queen's University in Belfast who heads up the Centre for the Theory and Application of Catalysis, has been awarded the Royal Society of Chemistry medal for his research into heterogeneous catalysis. Among the projects Prof. Burch has worked on were the removal of nitrogen oxides from car emissions via a catalytic converter and the development of catalysts for the clean combustion of renewable fuels.

34. Ozone Hole Reaches Record Size, UN Weather Experts Say

The ozone hole over the Antarctic this year has reached the record size of 10.8 million square miles set three years ago, the United Nations' weather organization has announced. Measurements over and near Antarctica show that ozone decreased more rapidly this year than in previous years and that the size of the ozone hole is now as large as it was in September 2000, said the World Meteorological Organization (WMO).

The hole, a thinner-than-normal area in the protective layer of gas high up in the Earth's atmosphere, has started forming at the end of Antarctic winter every year since the mid-1980s. In August, when the sun starts to rise again over Antarctica, it triggers accelerated ozone loss following extremely cold South Pole winters when the area remains in darkness.

This year's phenomenon is in stark contrast to the ozone hole last year, when it was the smallest in more than a decade after splitting in two during late September.

Emissions of chlorofluorocarbons have been curbed under a global accord. As a result, measurements show they are now decreasing in the lower atmosphere and have just peaked and stabilized in the critically important ozone layer in the stratosphere. Scientists predict it will take about 50 years for the ozone hole to close. According to the United Nations Environment Programme, consumption of CFCs, commonly used as propellants in spray cans, dropped from 1.1 million tons in 1986 to 110,000 tons in 2001.

The WMO said that the wider hole in 2003 did not point to any increase in the amount of ozone-depleting chemicals in the atmosphere, but rather was a reflection of changes in weather conditions over the Antarctic.

FORTHCOMING CONFERENCES

Spark Ignition Engine Emissions Short Course

17-21 November 2003, Weetwood Hall Conference Centre, Leeds, UK

Details at

www.leeds.ac.uk/fuel/shortc/sc.htm or

Alison Whiteley, cpd.speme@leeds.ac.uk

This specialist short course aims to review spark ignition engine combustion and emissions. Both 4 and 2 stroke engines are considered. Particular emphasis is placed on engine warm-up and catalyst performance and warm-up, non-regulated emissions and fuel composition influences.

Short courses on Aerosol Properties and Measurement

18-19 November 2003,
University of Birmingham, UK.

More info from
r.p.kinnersley@bham.ac.uk

Covers fundamental properties and behaviour of aerosols, and their size and composition measurement.

Short courses on Atmospheric particles: properties and measurement

20 November 2003, University of
Birmingham, UK.

more info from r.p.kinnersley@bham.ac.uk

Applies the fundamental principles of aerosol science to the study of atmospheric particles, including their origins, composition, measurement and effects.

International Conference on Euro V and Future Worldwide Emission Requirements for Passenger Cars and Light Duty Vehicles

10-11 December 2003, Museum of Science and Technology "Leonardo da Vinci" in Milano, Italy

Details from alouis.krasenbrink@jrc.it

The conference will be held to initiate and stimulate the scientific discussion with all involved parties on the definition of future EU vehicle emission regulations and will discuss the need and opportunities of harmonised emission measurement systems and emission standards.

Better Air Quality (BAQ) 2003 Workshop

17-19 December 2003, Manila, Philippines; details from

<http://adb.org/vehicle-emissions/Articles/baq2003.asp>

Workshop jointly hosted by the Clean Air Initiative for Asian Cities (CAI-Asia) and Air Pollution in Megacities of Asia (APMA) Project. Its objectives are

- *Discuss air quality management and control techniques in Asia and how stakeholders can benefit from worldwide experiences*

- *Expose participants to new technological developments in air quality monitoring, and discuss recommendations on appropriate technical solutions for different countries*

- *Share innovative and effective examples of air quality management, and adopt a strategic framework for air quality management and control in Asia*

Engenex 1 – Environmentally Aware Engineering

2 March 2004, DTI Conference Centre, London

More on www.engenex1.com

This is a new event which will provide a showcase for some of the latest technologies in the UK and Germany, providing opportunities for informal yet focussed partnering meetings.

2004 SAE World Congress

8-11 March 2004, Detroit, USA

Details from:

<http://www.sae.org/congress/index.htm>

3rd International Conference on Children's Health and the Environment

31 March – 2 April 2004, London school of hygiene and Tropical Medicine, London, UK

The conference is meant to be a world-wide platform dealing with health problems of children caused by environmental influences and themes will include Air Pollution, Environmental Smoke, Heavy Metals etc.

25th International Vienna Motor Symposium

29-30 April 2004, Conference Centre Hofburg Vienna

More on <http://www.oevk.at> from mid December 2003; e-mail info@oevk.at

The Symposium will show Latest Results in Worldwide Engine Development, Future Legislation, New Engines and Fuels, Components, Electronics and Drive train. New Engines and Components will be exhibited.

11th Nordic Symposium on Catalysis

23-25 May 2004, Oulu, Finland

Deadline for submission of extended abstracts is 15 December 2003. Details at: <http://cc.oulu.fi/~polamwww/nordic.html>

The aim of this symposium is to bring together all Nordic scientists working in field of catalysis. The symposium is a biennial meeting and the focus is Catalysis for a Sustainable Future. The three-day programme will include plenary lectures by invited plenary speakers, oral presentation of submitted papers, and a poster session.

World Automotive Congress FISITA 2004

23-27 May 2004, Barcelona, Spain

More on www.fisita2004.com

FISITA is a global conference on automotive technology with a session on "vehicles and the environment" dealing with, amongst other topics, emissions.

International Symposium on Internal Combustion Diagnostics

15-16 June 2004, Baden-Baden Kurhaus

Details from:

www.combustion-diagnostics.com

Themes are Pressure Indicating Technology, Visualisation and Simulation. The Symposium will be rounded off with papers on the use of these tools for further development of the HCCI combustion process.

2nd Emission Control 2004

17-18 June 2004, Dresden, Germany

More from the Institute of Internal Combustion Engines and Motor Vehicles (IVK), Dresden University of Technology, 01062 Dresden.

Emphases include: Spark ignition & diesel engines; emissions reducing methods applied within the engine; active and passive exhaust gas aftertreatment; control strategies; sensor technology; diagnostics; exhaust gas test methods; fuels & lubricants.

ISOTOPCAT – Isotopes in Catalytic Studies

7-9 July 2004, Poitiers, France

Abstracts are due 1 December 2003.

Details at: <http://labo.univ-poitiers.fr/umr6503/isotopcat/invitation/index.html>

ISOTOPCAT will deal with isotopes use in catalysis for mechanistic, kinetic and characterisation purposes. Four sessions will be organised covering Isotopic labelling for mechanistic studies; Isotopic exchange with solids (characterisation); Reaction kinetic studies using isotopes; Isotopic effects in heterogeneous catalysis