

# N AECC Newsletter

Association for Emissions Control by Catalyst

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Affiliated to CEFIC

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## July – August 2004

### INTERNATIONAL REGULATORY DEVELOPMENTS

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## **EUROPE**

### **1. German Car Makers agree to fit Particulate Filters**

Following a meeting with Chancellor Gerhard Schröder, the German motor manufacturers' association VDA has announced an agreement to fit particulate filters to diesel cars sold in Germany. For its part, the government will go ahead with a plan to provide tax incentives of €600 from 2005 for diesel cars with filters. Having repeatedly urged German car makers to install filters, environment minister Jürgen Trittin welcomed their agreement.

VDA said that with the incentives it expected a quarter of new diesel cars sold in Germany to be fitted with filters by the end of 2006. The proportion should reach 75% by the end of 2007 and 100% by the end of 2008.

Germany, with some other EU countries, is pressing the European Commission to bring forward plans for Euro 5 emission limits that would force fitment of filters.

### **2. Austrian call for Particle Filters**

The new Austrian SPÖ (Sozialdemokratische Partei Österreichs) environment spokesman Kai Jan Krainer has called for higher taxes on diesel cars without particle filters. He said that a particle filter would raise the price of a new car by about €60 but would help save some of the 2400 Austrians who died each year as a result of the ingestion of micro-particles.

### **3. Russian Carmakers to meet Euro 2 emissions Standard**

The deputy director of the industrial board at the Russian Industry and Energy Ministry, Nikolai Sorokin, has told a news conference that by 2005 all Russian carmakers will be ready to manufacture cars that meet the Euro 2 emissions standard. Simultaneously, factories that make export automobiles will

have to change to the Euro 3 standard. Mr. Sorokin said that the ministry expects every Russian carmaker to be ready to change to Euro 3 by 2006 and Euro 4 by 2008-2010. Within a month, the ministry will submit to the government a draft resolution on carmakers' change to international ecological standards.

### **4. Commission approves Aid for Filters in Denmark**

The European Commission has decided to approve aid to alleviate the cost of retrofitting Danish trucks with particulate filters. The Commission said that such filters will reduce the pollution level of mainly old lorries and so contribute to the protection of human health and the environment, in particular in bigger cities. Danish State aid will cover 30% of the additional costs for retrofitting Danish registered lorries of more than 3.5 tonnes with particulate filters. Beneficiaries of the measure are national and foreign operators of trucks.

### **5. Italian Programme to subsidize 'Green Vehicles'**

Three Italian city governments have signed up for a Ministry of Environment programme that will reimburse them for up to 65% of the cost of adding environmentally friendly vehicles to each city's fleet.

This is part of a wider effort by the Italian government to focus on vehicle emissions as a way to reduce its overall greenhouse gas emissions. Another 74 cities are reported to be studying the plan, which has a budget of €8 million this year, and a total of €90 million over the next three years.

### **6. Mercedes-Benz launches BlueTec Diesel-Engine Technology**

Mercedes-Benz has launched its BlueTec diesel-engine technology for commercial vehicles, which ensures up to 80% less harmful emissions in exhaust gases than the

levels under the Euro 3 standard. BlueTec has been produced in accordance with the Euro 4 standard, which will come into force in October 2005 (new models) and October 2006 (all registrations), and the Euro 5 standard, which will be effective from October 2008/09. BlueTec technology improves engines' efficiency (reduced fuel consumption) and treats exhaust gases using the Selective Catalytic Reduction (SCR) technology. Mercedes-Benz will deploy BlueTec in its Actros series trucks in early 2005. They will be followed by the trucks with engines above 235 kW and the long-distance road haulage Actros and Axor trucks. Further plans for introduction of BlueTec are related to models with engines between 235kW to 440 kW and a nominal torque of 1650 N/m to 2800 N/m. The BlueTec diesel engine technology is said not to require shorter periods of lubricant changes and more frequent maintenance, nor does it require low-sulphur fuel.

## **7. SCR Press Release**

Vehicle manufacturers DAF Trucks, DaimlerChrysler, Iveco, Renault Trucks, Volvo Trucks; Oil companies CEPSA, OMV & Total; and AdBlue producers AMI, BASF, SKW Piesteritz and Yara International have issued a Joint Press Release on the introduction of Urea SCR systems.

They say that the vast majority of western European heavy truck manufacturers, representing about 80% of the European truck market, have decided in favour of emission control using SCR technology to meet Euro 4 and Euro 5 emission standards. Supplies of the DIN 70070 AdBlue are assured by leading European urea producers, able to manufacture AdBlue in six European countries. Together with their distribution partners, they are currently establishing a Europe-wide network to supply their customers. Oil companies OMV and Total are already developing their strategy for the

implementation of SCR technology for commercial vehicles; other companies are in intensive discussions. This includes equipping public filling stations and refuelling stations operated by the European haulage industry with SCR fuelling systems, covering a wide range from combined diesel/AdBlue pumps with separate counter mechanisms and a single receipt for both products to small filling stations on company premises and fleet packages consisting of tanks and canisters.

## **8. Volvo launches 'World's Cleanest Diesel Bus Fleet'**

For operation between cities along the west coast of Sweden, Volvo Bus AB has provided Sweden's largest bus operator, Swebus, with a fleet of 27 buses that are claimed to be the world's cleanest diesel buses. They are powered by Euro 3-compliant diesel engines equipped with advanced emission control systems that include a diesel particulate filter and a urea-SCR system for NOx emission control. As a result, these diesel buses comply with the 2008 Euro 5 heavy-duty emission standards of 2 g/kWh NOx four years before Euro 5 standards are in force. Swebus has installed its own facilities to re-fuel the buses with ultra-low sulphur diesel fuel and urea on a daily basis.

## **9. Small Petrol-Fuelled Machinery Emissions Directive enters force**

Directive 2002/88/EC came into force on 1 August. It covers small petrol-fuelled non-road mobile machinery such as lawn mowers, chainsaws and hedge trimmers.

The Commission says that the Directive is expected to significantly reduce air pollution. One hour use of a normal chainsaw equipped with a two-stroke engine emits as much hydrocarbons as driving a modern passenger car for 2000km. In total, hydrocarbon emissions from these engines amount to

nearly 1 million tonnes in the EU25 every year. Small petrol-fuelled machines also produce significant NOx emissions. The Directive differentiates between seven types of machinery - handheld and non-handheld, and depending on engine size and sets different deadlines from 1 August 2004 to 1 February 2009.

## **10. Danish Ecological Council Leaflet on Diesel Particles**

The Danish Ecological Council has published a 20 page leaflet "Diesel particles – a health hazard".

The leaflet says that Danish researchers concluded that particles appear to cause approximately 5000 deaths annually in Danish Cities, and that a quarter of these could be avoided if heavy diesel vehicles were fitted with particle filters. It is also estimated that particles are implicated in 3300 additional cases of chronic bronchitis, 11 600 new cases of acute bronchitis in children under 15, and 160 000 additional asthma attacks. It says that now is the time to concentrate on diesel-powered private cars because of the increase in their sales, and that filters need to be promoted through legislation, green taxes and subsidies.

## **11. Toyota and Shell launch Trial of D-Cat and GTL Fuel**

Toyota and Shell are launching a 3 month trial of GTL (Gas to Liquids) diesel fuel in a fleet of 10 Toyota Avensis cars with D-CAT emission reduction technology as part of a joint research programme. The 'Driving Tomorrow's Clean Technology' trial is intended to demonstrate that low-emission GTL can be used in current diesel engines without any conversion or investment. In addition, when utilised in clean diesel vehicles such as the Avensis D-CAT, emissions are vastly improved without sacrificing performance.

## **NORTH AMERICA**

### **12. California ARB releases Draft Greenhouse Gas Proposal**

The California Air Resources Board (ARB) has released its draft proposal to reduce greenhouse gas emissions from passenger cars and light trucks by nearly 30%.

The proposal analyses a series of technology packages that automakers could use to reduce Greenhouse Gas emissions. The technology packages are aligned in sets that best take advantage of the natural synergy that exists between some technologies.

ARB estimates the average costs of packages for the regulation's first phase, scheduled for model years 2009 to 2011, to range from \$241 for light-duty passenger cars to \$326 for big pickups and SUVs. Average costs for the rule's second phase for model years between 2012 and 2014 are expected to be \$539 for light-duty passenger cars to \$851 for heavier vehicles.

The final staff proposal will be released in early August.

### **13. EPA and CARB reach Agreement on Retrofits**

The California Air Resources Board has announced an agreement with the US Environmental Protection Agency's Voluntary Diesel Retrofit Programme for the coordination of Diesel Retrofit Verification.

The agreement establishes reciprocity in verifications of hardware or device-based retrofits. The agreement commits ARB and EPA to work towards accepting particulate matter (PM) and oxides of nitrogen (NOx) verification levels assigned by the other's verification programmes. Additionally, as retrofit manufacturers initiate and conduct in-use testing, ARB and EPA agree to coordinate this testing so data generated may satisfy the requirements of each programme.

## **14. California to tighten Ozone Standard**

California Air Resources Board (ARB) and the Office of Environmental Health Hazard Assessment (OEHHA) have recommended tough new Ambient Air Quality Standards for ozone to protect the health of infants, children, and other at risk populations.

The state is proposing to retain its 0.09ppm 1-hour standard and establish a new 8-hour standard of 0.07ppm - substantially more stringent than the federal 8-hour standard of 0.08ppm because of the way compliance will be measured. These recommended standards are based on studies that clearly show adverse health effects at levels of 0.08ppm over several hours, and that more stringent standards are needed to protect the health of children and others.

## **15. Caterpillar Diesel Engines meet new EPA Off-Road Standards**

Caterpillar has become the first company to have a full line of diesel engines certified by the US Environmental Protection Agency to the off-road emission standards for 2005 and 2006. The company said that certification of seven Caterpillar engine models allows early production of the cleaner diesel engines. It also enables Caterpillar to offer customers a full line of engines featuring its ACERT technology in the 175 to 750 horsepower range. Machines powered by the engines will reach the market in October.

## **16. Mexico City Diesel Retrofit Project**

The launch of the Mexico City Diesel Retrofit Project has been announced by EMBARQ, the World Resources Institute's Centre for Transport and the Environment, the US Environmental Protection Agency, the Mexico City government, the Mexican Ministry for Environment and Natural Resources (SEMARNAT), and the Center for Sustainable Transport in Mexico City.

This is a pilot project to retrofit a limited number of Mexico City buses with advanced emissions control technology to reduce emissions of particulates and other pollutants from diesel engines. In Mexico City mobile sources, especially older diesel-powered trucks and buses, are a major cause of air pollution.

The project is designed to demonstrate how the combined use of cleaner fuels and diesel retrofit technologies can perform when applied to diesel engines operating under Mexico City's conditions. The project is similar to diesel retrofit projects now underway in several US cities where fleet owners and operators have committed to retrofit more than 150,000 diesel powered trucks, buses, and non-road equipment. Retrofit technologies can reduce diesel particulate emissions by 90% or more. To implement the project EPA and EMBARQ are awarding grants totalling \$511,000 to the Center for Sustainable Transport, a Mexico City-based non-governmental organization.

When completed, the project is expected to demonstrate that significant reductions in harmful emissions from older, heavy-duty diesel engines can be achieved cost effectively through a combination of tailpipe control technologies and a new generation of clean (ultra-low sulphur) diesel fuel.

## **ASIA-PACIFIC**

### **17. China introduces Nationwide 'Euro 2' Standards**

China has announced that it will impose nationwide automobile emission limits based on the EU's Euro 2 standards. These standards were first introduced in the Beijing and Shanghai metropolitan areas one year ago.

Manufacturing, importation, and sales of cars that fail to meet the new standards will be banned within one year. China will then

move to standards equivalent to the EU's Euro 3 by 2008.

Shanghai is now considering even stricter emissions controls and financial incentives to encourage use of natural-gas-powered cars and hybrid buses. Shanghai will ban oil-burning motorcycles and scooters from the city's main highways by 2008. The city is increasingly concerned about automobile emissions, since the number of vehicles on the road is increasing by 10 to 15% each year. Beijing is also looking to tighten standards next year.

### **18. South Korea issues detailed Emissions Rules**

South Korea's Ministry of Environment has unveiled detailed regulations to implement last December's legislation to improve air quality in Seoul and the capital city region.

The rules would set tougher emissions limits for vehicles and factories in Seoul and 25 surrounding cities. Two pieces of legislation, including a decree and a set of enforcement rules (Notice No. 2004-74 and 2004-75), provide numerical criteria and standards. According to a ministry announcement, the package of rules and regulations now needs parliamentary approval and should go into effect by January 2005.

From January 2005, carmakers selling at least 3000 cars every year and large suppliers of commercial vehicles in the region must include low emission vehicles (LEVs) in their sales inventory up to a percentage set annually by the ministry. These LEVs must meet the ministry's new LEV emissions standards, which will be toughened further in January 2006. Government agencies and other public institutions operating 10 or more vehicles will be required to purchase LEVs for at least 20% of their vehicle needs.

### **19. Australia adopts Low sulphur Fuels**

The Australian Minister for the Environment and Heritage has announced new fuel standards that will make Australian transport fuels among the cleanest in the world.

Sulphur in premium unleaded petrol will be limited to 50ppm from 1 January 2008, down from 150ppm now. Sulphur in diesel (currently 500ppm), will be cut to 50ppm on 1 January 2006 and capped at 10ppm from 1 January 2009.

The government estimates that by 2020, cleaner fuel initiatives will have saved \$3.4 billion in hospital and medical costs. They say that "These reductions will have an immediate impact on particle emissions from the existing vehicle fleet and, just as importantly, will hasten the introduction of the next generation of cleaner vehicle engines and emission controls. Pollution from particulate matter will be immediately reduced by 5% nationally with the introduction of 10ppm diesel. Reductions will increase as new vehicle technologies come on stream".

Regular unleaded petrol will contain maximum 150ppm sulphur from 1 January 2005, down from the current 500ppm maximum mandated since 1 January 2002.

### **GENERAL**

### **20. MARPOL Marine Emission Standards introduction**

The International Maritime Organization (IMO) has announced that their MARPOL Annex VI emission regulations for commercial, international marine vessels will come into force in May 2005.

They include:

- NOx emission limits ranging from 9.9 to 17g/kWh depending on engine speed.
- A global cap of 4.5 wt.% sulphur on

commercial marine diesel fuel.

- Provision for special SO<sub>x</sub> Emission Control Areas (SECA), including the Baltic and North Seas, where fuel must not exceed 1.5 wt.% sulphur or ships must have emission controls to limit SO<sub>x</sub> emissions.

These regulations will apply retroactively to new marine engines greater than 130kW installed on vessels constructed on or after January 1, 2000 or which undergo a major conversion after this date.

## **21. Link between Traffic and Respiratory Effects in Children**

Recent studies, primarily in Europe, have reported associations between respiratory symptoms and residential proximity to traffic, however few have measured traffic pollutants or provided information about local air quality.

In a new study published in the American Journal of Respiratory and Critical Care Medicine information on current bronchitis symptoms and asthma, home environment, and demographics were obtained by parental questionnaire and concentrations of traffic pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, black carbon, NO<sub>x</sub> and NO<sub>2</sub>) were measured at ten school sites during several seasons.

Although pollutant concentrations were relatively low, the authors observed differences in concentrations between schools near major roads versus those more distant (or upwind). They found associations between respiratory symptoms and traffic-related pollutants. Thus, they found spatial variability in traffic pollutants and associated differences in respiratory symptoms in a region with good air quality. The authors concluded that the findings support the hypothesis that traffic-related pollution is associated with respiratory symptoms in children.

## **22. Sustainable Mobility Report sets Seven Goals**

"Mobility 2030: Meeting the Challenges to Sustainability", is a report released by the World Business Council for Sustainable Development (WBCSD). The report was developed by 12 global automotive and energy companies to assess the sustainability of their products and to envision the future of mobility, especially road transport.

The report says that if current mobility trends continue, the social, economic and environmental costs worldwide will be unacceptably high. However, those costs can be avoided if society as a whole focuses on the achievement of seven goals. These include: ensuring conventional emissions from transport are not a significant health concern anywhere; limiting greenhouse gas emissions from transport to sustainable levels; and mitigating traffic congestion. The Mobility challenges will take up to half a century to resolve, requiring cooperation and effort from every level of society.

The report emphasises that "the key to sustainable mobility on a global basis will be achieving it in the developing world. Fundamental to achieving this is the need to narrow the mobility opportunity divides that exist within countries as well as between the world's poorest countries and the developed world".

## **23. California ARB Completes 10-Year Children's Health Study**

The landmark Children's Health Study, funded by the California Air Resources Board (ARB), followed more than 5500 children at 52 schools in Southern California from elementary through to high school to track how different outdoor air pollution exposures affect respiratory health.

The major findings of the study were:

- Significant lung function deficits are most

closely associated with exposure to nitrogen dioxide, atmospheric acidity, PM2.5 and PM10. This may have permanent adverse effects in adulthood;

- Children living in high ozone communities, who are especially active, are up to three times more likely to develop asthma;
- Children living near roadways with high traffic experienced an increased risk for having been diagnosed with asthma;
- Short-term exposures to elevated ozone levels are associated with a significant increase in school absences from both upper respiratory and lower respiratory illnesses such as asthma attacks;
- Children who move to cleaner communities with lower levels of PM have improvements in lung function growth rates. This means that even small reductions in air pollution can have immediate benefits to the long-term respiratory health of children living in polluted communities;
- Bronchitic symptoms are associated with exposure to nitrogen dioxide and the organic carbon fraction of PM2.5 in asthmatic children.

## **FORTHCOMING CONFERENCES**

### **Small Engine Technology Conference (SETC)**

27-30 September, 2004, Graz, Austria

Details at <http://www.sae.org/events/set>

*Sponsored by SAE and JSAE. Presentations will focus on innovative combustion technologies, emissions control, NVH, vehicle dynamics, safety and human factors. The effect of various regulatory actions and cost considerations on these technologies will be highlighted.*

### **13. Aachener Kolloquium "Automobile and Engine Technology"**

4-6 October 2004, Aachen, Germany

details from [www.rwth-aachen.de/ac-kolloquium](http://www.rwth-aachen.de/ac-kolloquium)

*The congress will provide a wide range of technical presentations addressing current challenges of the vehicle and powertrain industry. Programme-related test vehicles, prototypes and aggregates from participating companies and institutions will be presented on ika's test track. 82 exhibitors will present their products and services on an exhibition area of more than 1600 m<sup>2</sup>.*

### **Filtration in Transportation – 4<sup>th</sup> International Conference**

5-6 October 2004, Stuttgart, Germany

*There will be papers on Diesel Soot Filtration, Fuel Cell High-End Filtration, cabin air filtration and other related topics.*

### **Alternative Fuels and their Powertrain**

5-6 October 2004, IMechE, London, UK

Details at

<http://www.imeche.org.uk/conferencesandevents/event.asp?id=276&year=2004&type=>

*This seminar will address the current status of alternative and renewable fuels and address questions such the changes needed in powertrain technology to optimise performance on alternative and renewable fuels and the performance of emerging hybrids and HCCI combustion systems on future fuels.*

### **PM Emission Inventories**

18 October 2004, Milan, Italy

Details at <http://tfeip-secretariat.org/unece.htm>

*The workshop is specifically addressing the need of improving national PM emission inventories. The meeting is focused on new emission factor development, including measurement programmes, national programmes and new estimation methods for improving the PM emission inventories and to improve the exchange of information between the measurement, modelling and inventory scientific communities. Combustion, industrial, transport and agricultural sources will be addressed.*



## **Short Course on Diesel Particulates and NOx Emissions**

18-22 October 2004, Sacramento, USA

Details at

[http://www.leeds.ac.uk/fuel/shortc/diesel\\_usa.htm](http://www.leeds.ac.uk/fuel/shortc/diesel_usa.htm)

## **International Rare Earths Conference**

24-26 October 2004, Hong Kong

Details at [www.metalevents.com](http://www.metalevents.com)

*The programme is structured to cover all the main aspects of the rare earths industry, including an overview of the global rare earths; trends in rare earths demand; potential constraints on supply; the impact of the restructuring China's rare earths sector, and new sources of supply.*

## **SAE Powertrain & Fluid Systems Conference & Exhibition**

25-28 October, 2004, Tampa, Florida, USA

Abstracts are due 15 March 2004

Details at <http://www.sae.org/calendar/pfs/>

## **SAE Commercial Vehicle Engineering Congress and Exhibition**

26-28 October, 2004, Chicago, USA

Details at <http://www.sae.org/events/cve/>

*This new event will cover critical industry topics ranging from emissions and reliability to powertrain and engines across the diesel engine, construction, truck, and agricultural engineering industries.*

## **World Fuels Conference - Asia 2004**

8-10 November 2004, Singapore

Details at

<http://www.cwacts.com/hart/pdf/wfcas04.pdf>

*Demand for personal transportation in the Asian region is predicted to double over the next decade. Continued pressure from regional and international authorities to reduce pollution and control greenhouse gas emissions presents a significant challenge to produce clean, efficient, safe and affordable vehicles and fuels. Both energy and environmental issues and agendas are furthering the alternative fuels market.*

## **Innovative Powertrain Systems**

11-12 November 2004, Dresden, Germany

Details at <http://www.vdi.de/fvt>

*The conference will deal with improvements of today's gasoline and diesel engines; new fuels; hybrids; new solutions for transmissions; energy storage and management; and fuel cell technology.*

## **International Fuel quality Center's Automotive & Marine Fuels Technology & Policy Briefing**

18 November 2004, Prague, Czech Republic.

Details at

<http://www.worldfuels.com/pdf/ifqcprague.pdf>

*Topics include Russian and East European fuel quality developments including the role of bio fuels; how will the enlarged Europe meet current and future conventional and alternative fuel quality requirements? the effect of emerging global heavy fuel oil, marine and bunker fuel markets.*

## **Internal Combustion Engine Performance & Emissions Conference**

7-8 December 2004, IMechE, London, UK

*This Conference will address the on-going need for emissions reduction strategies and technologies in automotive, truck, off highway, industrial, marine and locomotive market sectors.*

## **Symposium on International Automotive Technology**

19-22 January 2005, Pune, India

Details at

<http://www.araiindia.com/html/siat2005/siatindex.htm>

*Topics will include Durability evaluation techniques, Power train, Engine, Emissions (EU3 and beyond), Fuel, Inspection & Maintenance Programmes, Global Harmonisation of Standards, Off-road vehicles, and Emissions inventory and ambient air quality.*

## **International Conference on Sustainable Transportation in Developing Countries (ENVIRONMENT 2005 Exhibition & Conference)**

30 January-2 February 2005, Abu Dhabi International Exhibition Centre, United Arab Emirates. Details at: [www.ee-uae.com](http://www.ee-uae.com).

*Organized by the Environmental Research & Wildlife Development Agency (ERWDA) and the General Exhibitions Corporation (GEC). The conference marks the first part of a chain of international activities to promote sustainable transportation in developing countries. It will address policy issues related to sustainable transportation and the long term objective is to contribute to the promotion of awareness of environmentally sustainable transportation (EST) and its linkages to the socio-economic, health and environment issues.*

## **Additives 2005**

5-7 April 2005, Dublin, Ireland

*This meeting will put future developments of fuel and lubricant additive technology in the context of the challenge in simultaneously meeting the needs of vehicle owners and of government legislators on targets for exhaust emissions, fuel economy and vehicle recyclability.*

## **SAE 2005 World Congress**

11-14 April 2005, Detroit, USA

Details at [www.sae.org/congress](http://www.sae.org/congress)

## **SAE Fuels and Lubricants Conference**

11-13 May 2005, Rio de Janeiro, Brazil

Details at <http://www.sae.org/>

*Topics will include Combustion & Emission Formation Processes in SI and Diesel Engines; Large Stationary Diesel Engines; In-Use Emissions Performance and Technology Trends; Automotive Catalyst and Converter Technologies for LEV and Beyond; Aftertreatment for Gas Direct Injection and Diesel; Lubricants and Fuels.*

## **Beograd 2005 EAEC European Automotive Congress**

30 May-1 June 2005, Belgrade, Serbia & Montenegro

Details at

[www.jumv.org.yu/eaec2005/prog2.html](http://www.jumv.org.yu/eaec2005/prog2.html)

*Main topics include advanced propulsion and powertrain, energy, emissions, ecology, environment; safety; automotive logistics; and advanced engineering technics and tools.*

## **VDI Congress Trucks and Buses – Solutions of reliability, sustainable environment and transport efficiency**

9-10 June 2005, Böblingen, Germany

*In 2005 the first vehicles that satisfy Euro 4 exhaust gas regulations will come to the market, but what solutions are being offered for regulations after that? In addition there are requirements on safety, and the introduction of toll systems.*

Deadline for abstracts: 22 October 2004.

## **Non-CO2 Greenhouse Gases (NCGG-4) Science, Control, Policy, Implementation**

4-6 July 2005, Utrecht, The Netherlands

Details at [www.ncgg4.nl](http://www.ncgg4.nl)

*The symposium will focus on the non-CO2 greenhouse gases. The symposium will be conducted in parallel sessions, focussing on the main themes: sources, sinks and inventories, monitoring and modelling and control and policy implementation.*