



Newsletter

May - June 2010

INTERNATIONAL REGULATORY DEVELOPMENTS

Table of Contents

EUROPE	2
Implementing Regulation on Hydrogen-Powered Vehicles	2
Commission Study on New Diesel Roadworthiness Test using NO/NO ₂	2
European Parliament Seminar on Black Carbon	2
Council Conclusions on the Action Plan on Urban Mobility	2
EEA says Europe will Exceed National Emissions Ceilings in 2010	2
Commission Communication on EU Greenhouse Gas Target	3
Report on EU Greenhouse Gas Emissions	3
EU Parliament and Member States reach Agreement on Industrial Emissions	3
Energy and Transport Figures Pocketbook 2010	3
ECJ Advocate General's Opinion on MMT	4
Commission sends Italy a Final Warning on PM ₁₀	4
Final UK Air Quality Indicators for 2009	4
Campaign for Clean Air in London calls for Retrofit and Scrappage Subsidies	4
Germany to Extend MAUT	4
Milan extends Ecopass to Euro 4 Diesels without DPFS	5
Swiss Proposal on Differentiated Fees for Heavy-duty Vehicles	5
Czech Regulation on Stationary Source VOC Emissions	5
Germany updates Fuel Quality Order	5
Sweden adopts Stricter Sulfur Limit for Ships	5
NORTH AMERICA	6
Future US Pollutant and Greenhouse Gas Emissions Standards	6
CARB discusses Limits on Black Carbon	6
US-EPA proposed Revised Emissions Standards for Stationary Engines	6
CARB extends Harbour Craft Regulation	7
California publishes Draft Test Procedures for SI Marine Vessels	7
Technical Bulletins on Diesel Retrofit	7
Vancouver proposes Emissions Standards for Off-road Equipment	7
Ontario to offer Subsidies for Hybrids	7
EPA seeks Input on Particulate Standards for Residential Wood Heaters	7
US-EPA says only 19% of Trucks have been 'Reflashed' to Lower NOx Emissions	8
US-EPA proposes Amendments to Fuel Conversion Regulations	8
US-EPA delays decision on Ethanol Blends in Gasoline	8
SOUTH AMERICA	8
Brazilian Truckers sign Emissions Monitoring Accord	8
Colombia to eliminate Import Fees on Clean Vehicles	9
ASIA PACIFIC	9
Japan considers Stricter NOx Standards for Diesel Trucks and Buses	9
China's Pearl Delta Cities Implement China IV Emissions Standards	9
China requiring NO ₂ Measurement	9
China announces Subsidies for Plug-In Hybrids and Electric Cars	9
China announces Guidelines for Alternative-Fuelled Vehicles	10
Beijing Environmental Statement for 2009	10
Hong Kong, China, targets Emissions from Off-Road Vehicles	10
Speech by the Transport Commissioner for Hong Kong, China	10
Hong Kong, China, publishes 10 ppm Fuel Regulation	11
Rising Number of Motor Vehicles in India contributes to Poorer Air Quality	11
Delhi to increase Vehicle Road Tax	11
International Centre for Automotive Technology in India	11
Indonesian Air Quality worsens	11
New Zealand Government proposes to Relax PM ₁₀ Air Quality Standards	12
AFRICA	12
Unleaded Fuel for Tunisia, Lower Sulfur in Tunisia, Kenya and Tanzania	12
UNITED NATIONS	12
Retirement of GRPE Chairman	12
GENERAL	12
Global NGO on Shipping launched	12
RESEARCH SUMMARY	13
FORTHCOMING CONFERENCES	15

EUROPE

Implementing Regulation on Hydrogen-Powered Vehicles

Commission Regulation (EU) No. 406/2010 was published in the EU's Official Journal on 18 May 2010. This is an implementing Regulation for the type approval of hydrogen-powered vehicles to Regulation (EC) No. 79/2009. The document includes the administrative documents for EC Type Approval of components and systems; the construction-related requirements for components and systems; vehicle identification requirements; and safety requirements.

Commission Study on New Diesel Roadworthiness Test using NO/NO₂

The European Commission's Directorate General for Transport (DG-MOVE) has issued a tender notice for a study on a new diesel emissions test for roadworthiness, to use NO/NO₂.

One purpose of the study is stated to be to "carry out NO/NO₂ laboratory measurements on different new vehicles (including passenger cars, light-duty vehicles and heavy-duty vehicles, or engines with different exhaust aftertreatment systems under simulated failure conditions) with the aim of defining a practical and reliable test procedure useful for PTI purposes. This measurement should be done under different conditions as well as simulated defects. The measurement results shall be compared with the measurement results at type approval."

The study will also evaluate the correlation between the existing measurement devices (opacity meter) and new devices, "as e.g. a scattered light measurement for PM measurement, with different other high-quality devices as used for type approval and system development, to elaborate the possibility for its use for the existing vehicle fleet."

European Parliament Seminar on Black Carbon

The European Parliament hosted a roundtable discussion on Black Carbon on 22 June 2010. The debate, entitled "Small Particle, Big Problem: The emerging link between black carbon and climate change" involved MEP Graham Watson (Liberal Democrat, UK); Dr. Frank Raes, head of the Climate Change Unit at the EU's Joint Research Centre (JRC); Dr. Werner Reh, head of transport policy for BUND/Friends of the Earth Germany; Niels Ladefoged, a Member of the Climate Action Commissioner's cabinet; and Nick Nuttall of the UN Environment Programme.

Ladefoged, the Climate Commissioner's representative, told participants that reducing emissions of Black Carbon should be pursued as a 'no-regret' policy benefiting climate and health, but it must not distract from cutting CO₂. Studies have suggested it is second only to CO₂ as a contributor to global warming, but with an atmospheric lifespan of weeks rather than years.

JRC's Raes said that Black Carbon's contribution to climate change is not yet a scientific certainty, but it is likely to contribute. Black Carbon emissions reductions could come from road transport (especially diesel vehicles), household biomass burning, and landfill and waste, he said. Raes argued that the regional impacts of Black Carbon may be even more significant. In the Arctic or the Himalayas, for instance, soot settling on ice and snow cover is accelerating melt rates, he said. Werner Reh called for a revision of EU legislation on Non-Road Mobile Machinery (NRMM) to cut these emissions. The UNEP spokesman, Nick Nuttall, suggested that if it could be more accurately measured in future, Black Carbon could form part of a global climate deal.

In addition to climate change, the health implications of particulate pollution make a compelling case for tackling Black Carbon, speakers agreed.

Council Conclusions on the Action Plan on Urban Mobility

At the EU Transport, Telecommunications and Energy Council meeting on 24 June 2010, the Council adopted their conclusions on the Commission Green Paper on Urban Mobility, including the Commission Communications on sustainable transport and a strategy for clean and energy efficient vehicles.

The Council emphasised the important role of transport in meeting targets for air quality and in the reduction of greenhouse gas and other pollutant emissions by 2020. The statement issued by the Council said that it considers that air quality limit exceedences in some cities may indicate a case for the adoption at local level of innovative measures to enable limit values to be met, such as the designation of ecological or low-emission areas, where the evidence suggests they will be effective.

EEA says Europe will Exceed National Emissions Ceilings in 2010

A press release from the European Environment Agency (EEA) issued on 4 May 2010 says that this year about half of the EU's Member States expect to miss one or more of the legal limits set by the National Emission Ceilings (NEC) Directive.

According to recent data compiled by EEA, eleven countries expect to exceed their ceilings by significant

amounts - some missing NOx targets by more than 40%. Of the four pollutants covered by the NEC Directive, EU Member States have the greatest difficulty meeting the emission limits for NOx. Only 16 expect to achieve their respective NOx ceilings, with road transport bearing most of the blame. The road transport sector contributed around 40% of total EU-27 NOx emissions in 2008 and although the sector's overall emissions have decreased since 1990, the reduction has not always been as large as originally anticipated. This is partly because the sector has grown more than expected and partly because vehicle emission standards have not always delivered the foreseen level of NOx reductions, EEA says.

The EEA report and data are available at www.eea.europa.eu/highlights/europe-to-exceed-air-pollutant. An EEA technical report and the final dataset will be published later in 2010.

The EEA notes that the Thematic Strategy on Air Pollution adopted by the Commission in 2005 lists a revision of the National Emission Ceilings (NEC) Directive as an important action to achieve health and environmental targets by 2020. This revision is expected to propose stricter emission ceilings for 2020 in order to protect health and the environment further. It could also, for the first time, introduce a ceiling for fine particulate matter (PM_{2.5}).

However, recent press reports say that the European Commission does not plan to revise the NEC Directive until 2013 because Environment Commissioner Janez Potočnik intends to focus first on biodiversity, resource efficiency and water in the years 2010, 2011 and 2012 respectively.

Commission Communication on EU Greenhouse Gas Target

On 26 May 2010 EU Climate Action Commissioner Connie Hedegaard presented a paper making the case for moving towards a unilateral 30% cut in EU greenhouse gas emissions by 2020.

The Communication argued that increasing the EU's 2020 climate goal to a 30% emission reduction from 1990 levels would be both affordable and technically feasible. The Commission estimates that as a result of the economic downturn, the cost of meeting the current 20% target has dropped to €48 billion per year until 2020, down from an initial estimate of €70 billion when the package was agreed. Hedegaard said the next step would be to analyse the impact of raising the targets for individual Member States.

Report on EU Greenhouse Gas Emissions

The European Union's greenhouse gas (GHG) inventory report, compiled by the European Environment Agency (EEA), shows that emissions

have not only continued their downward trend in 2008, but have also picked up pace. The emissions of the 27 Member States were 11.3 % below 1990 levels.

The economic recession contributed to emissions reductions from several sectors including road transport, manufacturing and construction. Road transport emissions were also affected by high oil prices, the continued decline in gasoline consumption and a reversal of the upward trend in diesel sales.

The report is available at www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2010

EU Parliament and Member States reach Agreement on Industrial Emissions

On 18 June 2010, the European Parliament and EU Member States reached political agreement on the revision of the Integrated Pollution Prevention and Control Directive (IPPC) on industrial emissions.

The accord aims to close loopholes in the previous legislation to ensure that industrial installations meet stricter limits on the pollutants they release. It obliges industrial operators to obtain permits from national authorities based on Best Available Techniques (BAT). The permits include precise limit values for pollutants such as SO₂, NOx, VOCs and dust.

Countries will be able to delay meeting more stringent pollution standards until 30 June 2020 by drawing up transitional national plans to ease the burden of cleaning up their industry. Combustion plants will not need to meet the higher standards if they close by the end of 2023 and do not operate for more than 17 500 hours. The scope for deviation from BAT has been restricted, though. Derogations may be required to account for local conditions, but they will only be allowed where the application of BAT would lead to "disproportionately higher costs compared to the environmental benefits". In addition, the European Commission will assess the need for minimum emissions limits for individual activities every 3 years.

The full Parliament will vote on this in its July session.

Energy and Transport Figures Pocketbook 2010

The European Commission has published an overview of the most recent and most pertinent annual energy- and transport-related statistics in Europe. It covers the European Union and its 27 Member States and, as far as possible, the current EU candidate countries and the EFTA countries.

The publication consists of four parts, being:
(1) general economic and other relevant data;
(2) data on energy production, consumption, taxation and prices;

(3) a transport part covering both passenger and freight transport plus other transport-related data;
(4) data on the impact which the energy and transport sectors have on the environment.

Electronic copies can be downloaded at http://ec.europa.eu/energy/publications/statistics/statistics_en.htm.

ECJ Advocate General's Opinion on MMT

The Advocate General has published her Opinion for the European Court of Justice (ECJ) on the case concerning manganese limits and labelling of metallic additives in the EU Fuel Quality Directive. The case was brought by Afton Chemical against the UK Secretary of State for Transport and was immediately referred to the ECJ.

The key findings of the Opinion are that Afton's claim that the Commission made a 'manifest error of assessment' regarding the compilation of the information required to decide on manganese limits is not substantiated; that the prevention of risks of the use of MMT for human health and the environment should be recognised as objectives of the limits; that there is no substantiated doubt as to whether the limits can be implemented and are appropriate for attaining their objective; and that the limits in the fuel quality directive are not manifestly unreasonable.

Regarding the validity of the labelling requirements, the Advocate General concludes that the labelling requirements could have been drafted more clearly, but "it is in no case justifiable to expose the consumer without warning to the risk of forfeiting their [vehicle] manufacturer's guarantee simply in order to allow the continued sale of a product entailing risks."

Overall, the Advocate General proposes that the Court of Justice should answer that examination has disclosed nothing which could call into question the validity of Article 1(8) of Directive 2009/30/EC.

Commission sends Italy a Final Warning on PM₁₀

The Commission says that it is sending Italy a final warning for its failure to comply with air quality legislation, notably particulate matter (PM₁₀) limits. In February 2010 the commission rejected 11 out of 12 of Italy's requests for time extensions to meet the air quality requirements for PM₁₀.

Final UK Air Quality Indicators for 2009

The UK's final report on air quality indicators for 2009 shows a general improvement in monitored air quality compared to 2008.

The indicator measures annual levels of pollution from particulates (PM₁₀) and ozone, as well as the number of days on which levels of any one of a basket of five pollutants were "moderate or higher".

Urban background particulate levels averaged 19 µg/m³ in 2009, unchanged from 2008. There has been an overall decreasing trend since 1993, the first year for which data were available. Roadside particulate levels averaged 22 µg/m³ in 2009, compared to 26 µg/m³ in 2008. Again, there has been a general downward trend since the series began in 1997. Urban background ozone levels averaged 55 µg/m³ in 2009 compared to 59 µg/m³ in 2008 and 44 µg/m³ in 1992, the first available data. These levels had shown an overall increasing trend since 1992, but this has shown signs of levelling out in recent years. Rural ozone levels averaged 68 µg/m³ in 2009, compared to 71 µg/m³ in 2008 and 59 µg/m³ in 1987, the first available data. There is, the report says, no clear long term trend.

In urban areas, air pollution in 2009 was recorded as moderate or higher on 10 days on average per site, compared with 26 days in 2008, and 59 days in 1993. This series has shown a high degree of year-on-year variability and there is no clear long term trend. In rural areas, air pollution in 2009 was moderate or higher for 32 days on average per site, compared with 45 days in 2008 and 21 days in 1987. This series has also fluctuated significantly over time, with no long term trend. The full report is available for download at <http://www.defra.gov.uk/evidence/statistics/environment/airquality/download/pdf/20100429ns.pdf>.

Campaign for Clean Air in London calls for Retrofit and Scrapage Subsidies

In a response to the London Mayor's consultation on the London Low Emission Zone (LEZ), the Campaign for Clean Air in London (CCAL) says that the annual number of exceedences of the PM₁₀ daily limit value has already, in less than 6 months, been breached. CCAL says it rejects the mayor's proposal to delay phase 3 of the LEZ - the application to light commercial vehicles - to 2012, and calls on the mayor to take more urgent, more radical action to improve air quality throughout London. The mayor should, CCAL says, subsidise 'one-off' retrofit and scrapage costs for LEZ phase 3 operators.

Germany to Extend MAUT

Germany's Federal Transport Minister, Peter Ramsauer, announced on 10 June 2010 that in 2011 the government plans to extend the motorway lorry toll (MAUT) to all four-lane federal roads.

Four-lane federal roads are increasingly used by goods traffic in order to avoid motorway tolls, Mr Ramsauer said in an interview with the newspaper *Hamburger Abendblatt*. So far the MAUT is only charged on a limited number of federal roads heavily used by lorries. Green Members of the Bundestag welcomed the plans but say the charge should apply

to lorries over 3.5 tonnes and not over 12 tonnes as under existing legislation.

Milan extends Ecopass to Euro 4 Diesels without DPFs

About 15 000 Euro 4 vehicles without particulate filters that were previously exempted from Milan's Ecopass system will, from 1 June 2010, have to pay €5 per day to enter the centre of Milan.

The decision will affect an average of 4 300 cars and 10 800 commercial vehicles daily. For residents an annual subscription will cost €72.50 instead of €125. Deputy Mayor Riccardo De Corato said that Euro 4 vehicles without DPFs could now be included in the Ecopass because Euro 5 vehicles with the most efficient reductions of particulate matter are available.

Swiss Proposal on Differentiated Fees for Heavy-duty Vehicles

The Swiss Federal Office for the Environment and the Federal Office of Transport are proposing performance-related Heavy Vehicle Fees (HVF) and requirements on particle filters.

A 10% discount on the HVF is proposed for heavy goods vehicles that have been retrofitted with efficient particle filters. All vehicles (i.e. Swiss and foreign HGVs) classified in exhaust categories Euro II and Euro III will qualify for the discount if they can demonstrate that they have been retrofitted with a particle filter to comply with the particle emission limit of Euro IV. As soon as the definitive exhaust level has been defined in the EU for Euro VI, it would be possible to extend this measure to HGVs in categories Euro IV and Euro V.

Particle reduction systems would be recognised if they comply with particle reduction category 2 (PMK2) in accordance with Annex XXVII of the German motor vehicle registration ordinance (commonly known as Anlage XXVII). Documentation required as evidence of compliance would be an entry into the vehicle licence confirming retrofitting of an approved system, or, for Swiss-registered vehicles, certification of an entry into the FOEN list or a VERT or AKPF report.

Czech Regulation on Stationary Source VOC Emissions

The Czech Republic has notified the Commission of a draft Regulation on emission limits and other conditions for the operation of stationary air pollution sources that emit and use volatile organic substances, and on the method of handling products containing volatile organic substances.

The draft Regulation transposes a number of EU Directives, including those on Stage II vapour recovery at petrol stations. It also provides a

comprehensive reworking of the current Czech Regulation in order to correct certain deficiencies arising during application and to remove duplication.

Germany updates Fuel Quality Order

Germany has notified the European Commission of a draft Order on the introduction of E10 petrol.

The Order increases the blending limits for ethanol in petrol from the current 5% v/v to 10% v/v. The quality requirements for E10 (10% ethanol) petrol are stipulated in the April 2010 edition of E-DIN 51625-1, and are included in the Order on the quality of fuels.

Details of what the document describes as a 'reference fuel' with a maximum oxygen content of 2.7% by mass and a maximum ethanol content of 5% by volume (E5) as per the same DIN standard is included. The Order puts forward a provision under which this 'reference fuel' is offered and consumers are informed. E5 petrol which satisfies the requirements of DIN EN 228, as updated in November 2008, will continue to be permitted (under EU legislation, E5 fuel is required to still be available for vehicles that cannot use E10). The labelling obligation for fuels containing metallic additives (in line with the latest EU Fuel Quality Directive) is included in this Order for the first time.

In addition to the changes for petrol, the sulfur content of diesel fuel used in mobile machinery and equipment (including inland waterway vessels) is lowered from 1000 to 10 ppm as of 2011 in accordance with the new requirement set out in EU Directive 98/70/EC. The Order also records that the August 2008 edition of DIN 51628 (Diesel fuel) is no longer required and lapses as a result of the inclusion of the May 2010 edition of DIN EN 590. Standards for biodiesel and LPG have also been updated under DIN EN 14214, April 2010 edition, and DIN EN 589, November 2008 edition.

Sweden adopts Stricter Sulfur Limit for Ships

The Swedish government has announced that from 1 August 2010 they will reduce the current maximum of 1.5% for the sulfur content of marine fuels used by ships in the Baltic Sea, North Sea and English Channel to 1.0%.

The limit will reduce acidity particularly in southwestern Sweden, which continues to experience "significant problems" with acid rain, Environment Minister Andreas Carlgren said.

NORTH AMERICA

Future US Pollutant and Greenhouse Gas Emissions Standards

US President Barack Obama has signed a presidential memorandum that calls on the US Environmental Protection Agency (EPA) and the Department of Transportation (DOT) to develop fuel economy and greenhouse gas emissions standards for 2014-2018 model year heavy-duty on-road trucks. The memorandum calls for the truck standards to be finalised by 30 July 2011. On the same day, the Canadian government announced that it will adopt similar heavy-duty standards.

The memorandum also calls on EPA and DOT to begin work, with California, on the next round of fuel efficiency/greenhouse gas standards for light-duty vehicles, to cover the 2017-2025 model years. EPA has indicated that it will issue an Advanced Notice of Proposed Rulemaking (ANPRM) on these light-duty vehicle standards by the end of September 2010. California is expected to release its proposed light-duty greenhouse standards for 2017-2025 during the summer, and this is expected to be the basis for the national programme that EPA and DOT will describe.

In addition to developing future greenhouse gas emissions standards, the presidential memorandum also requests EPA to review current non-greenhouse gas emissions regulations for new vehicles, new motor vehicle engines, and motor vehicle fuels and to develop new standards as part of a comprehensive regulatory programme. This will allow EPA to develop a Tier 3 light-duty emissions programme that could be modelled on California's LEV-III proposal. President Obama also directed the Department of Energy to provide increased support for deployment of advanced vehicles, including electric vehicles.

CARB discusses Limits on Black Carbon

The California Air Resources Board (CARB) held a public meeting on 18 May 2010 to discuss proposals for the 2017-2025 model year greenhouse gas (GHG) rules. The initial proposals include limits on Black Carbon.

CARB officials said they have now combined several state vehicle regulatory programmes into a package called "Advanced Clean Vehicle Standards" which includes the state's zero-emission vehicle rule, low-emission vehicle (LEV III) standards covering criteria pollutants, and new "Pavley II" GHG standards. CARB plans to approve these rules in November 2010.

Overall, CARB is looking for a 50% reduction of GHGs from vehicles by the 2025 model year, compared with a 2009 vehicle baseline, Tom Cackette, CARB chief deputy executive officer, said at the meeting. As part

of the regulation, CARB is proposing to add Black Carbon to the GHGs targeted by the standards for 2017-2025 model year vehicles, officials said. CARB staff believes that cutting Black Carbon from vehicles can achieve "rapid near-term reductions" in global warming trends. EPA is separately looking at steps it could take to help cut Black Carbon emissions. CARB plans to hold another meeting in August 2010 about the Black Carbon proposal.

CARB also said they are working closely with officials involved with the next UN IPCC (Intergovernmental Panel on Climate Change) assessment report and that a proposed figure for the GWP (Global Warming Potential) of black carbon is forthcoming.

US-EPA proposed Revised Emissions Standards for Stationary Engines

On 21 May 2010, the US Environmental Protection Agency (EPA) proposed revised emissions standards for stationary engines.

This proposal envisages revised emissions limits for NO_x, PM, and HC from large stationary diesel engines with a displacement of 10 to 30 litres per cylinder. EPA proposes limiting emissions to the same levels as those for similarly-sized non-road diesel engines used in marine applications. The standards would be applied in two Tiers. It is also proposed to align the standards for large stationary compression ignition engines with a displacement greater than 30 litres per cylinder with standards for similar marine engines. There are also minor revisions to the standards for new stationary spark ignition engines to mirror certain revisions for compression ignition (CI) engines.

Proposed 1st Tier standards, CI engines ≥10 & <30 litres/cylinder

Engine size displacement (d) in litres/cylinder, and rated power	PM (g/kWh)	NO _x +HC ¹ (g/kWh)	Year
10.0 ≤ d <15.0, <3700 kW	0.14	6.2	2013
15.0 ≤ d <20.0, <3700 kW	0.27 ²	7.0	2014
20.0 ≤ d <25.0, <3700 kW	0.27	9.8	2014
25.0 ≤ d <30.0, <3700 kW	0.27	11.0	2014

¹ NO_x+HC standards do not apply to 2000 to 3700 kW engines.

² For engines <3300 kW in this group, PM standard is 0.34 g/kWh

Proposed 2nd Tier standards, CI engines ≥10 & <30 litres/cylinder

Rated power	PM (g/kWh)	NO _x +HC ^b (g/kWh)	HC (g/kWh)	Year
≥ 3700kW	0.12 ^a	1.8	0.19	2014 ^c
	0.06	1.8	0.19	2016 ^{b,c}
2000 ≤ kW <3700	0.04	1.8	0.19	2014 ^{c,d}
1400 ≤ kW <2000	0.04	1.8	0.19	2016 ^c
600 ≤ kW <1400	0.04	1.8	0.19	2017 ^b

^a This standard is 0.25 g/kWh for engines of 15-30 litres/cylinder.

^b Optional compliance start dates can be used in these model years.

^c Option: 1st Tier PM/NO_x at 0.14/7.8 g/kWh and 2nd Tier in 2015.

^d 1st Tier PM standards continue to apply for these engines in model years 2014 and 2015 only.

EPA expects the 1st Tier to require improved fuel injection, calibration optimisation, and use of ultra-low sulfur diesel fuel. The 2nd Tier is expected to require technologies such as Catalysed Diesel Particulate Filters and Selective Catalytic reduction (SCR).

For engines of over 30 litres per cylinder, installed prior to 1 January 2012, the proposed standard is 17.0 g/kWh NOx when maximum engine speed is less than 130 rpm. Where the engine speed is 130 or more but less than 2000 rpm, the NOx limit is to be $45+n^{-0.2}$ where n is the maximum engine speed.

For engines installed after 1 January 2012, a more stringent standard is proposed: this is to be 14.4 g/kWh when the maximum engine speed is less than 130 rpm, $44+n^{-0.23}$ g/kWh where it is 130 or more but less than 2000 rpm, and 7.7 g/kWh for ≥ 2000 rpm. For engines installed after 1 January 2016 a still more stringent standard - expected to require the use of aftertreatment - is proposed: this is to be 3.4 g/kWh when the maximum engine speed is less than 130 rpm, $9.0+n^{-0.20}$ g/kWh where it is ≥ 130 but < 2000 , and 2.0 g/kWh for maximum speed ≥ 2000 rpm.

Details of the proposal are at www.epa.gov/ttn/oarpg/t1/fr_notices/nsps_ci052510.pdf.

CARB extends Harbour Craft Regulation

At their Hearing on 24 June 2010 the California Air Resources Board (CARB) agreed to add dredgers, barges and crew and supply vessels to the existing harbour craft regulations. The changes will, CARB estimates, bring about 600 extra engines into the legislation. About half of these will be required to upgrade their engines to the cleanest available engine technology by 2016 for Tier 0 engines and 2022 for Tier 1 units. EPA estimates that the changes will reduce PM emissions by 275 tons and NOx by 3475 tons in the period 2011 to 2025.

California publishes Draft Test Procedures for SI Marine Vessels

On 12 May 2010, the California Air Resources Board published Regulations to control evaporative emissions of recreational marine engines. This was followed by the publication of four supporting test procedures. The four procedures cover diurnal emissions (TP-1501), hot soak emissions (TP-1502), diurnal vented emissions (TP-1503) and permeation emissions (TP-1504). Details are at www.arb.ca.gov/msprog/offroad/recremarine/recremarine.htm.

Technical Bulletins on Diesel Retrofit

The US Environmental Protection Agency (EPA) has released new technical bulletins on the use of Diesel Particulate Filters (DPF) and Diesel Oxidation Catalysts (DOC) in diesel retrofit projects. The bulletins provide general information on how the

technologies work, plus information on installation, operation and maintenance. They are available on EPA's National Clean Diesel Campaign website at www.epa.gov/cleandiesel/publications.htm#tech.

Vancouver proposes Emissions Standards for Off-road Equipment

Metro Vancouver, BC, Canada has proposed emissions standards for diesel-powered off-road heavy equipment of over 25 hp, to start from 2012. The proposed by-law would affect construction, goods handling and industrial equipment, cranes and stationary diesel engines.

The by-law would become effective in 2012 for equipment with Tier 0 engines and in 2014 would be extended to Tier 1 engines. Metro Vancouver estimates that half of the region's 30 000 machines use such engines. Operators would have to be registered with the city and would pay an annual fee which would increase with time. For example, a Tier 0 machine owner would have to pay \$4/hp per annum in 2012 and \$20/hp in 2017. Details are at www.metrovancouver.org/services/permits/DieselEmissions.

Ontario to offer Subsidies for Hybrids

Starting on 1 July 2010, the Canadian province of Ontario will provide a rebate of C\$5 000-8 500 (€3 823-6 500) to consumers, businesses, or other organisations that purchase new, plug-in, hybrid electric, or battery electric vehicles, Transportation Minister Kathleen Wynne said on 18 June 2010.

The rebate, available to the first 10 000 qualified applicants, is intended to help the provincial government meet its goals to have 5% of vehicles electrically powered by 2020 and to reduce emissions of greenhouse gases by 6% from 1990 levels by 2014, Wynne said in a written statement. The provincial government is also promoting the use of electric vehicles through special green license plates that permit drivers of electric vehicles to use carpool lanes, even if there is only one person in the vehicle.

EPA seeks Input on Particulate Standards for Residential Wood Heaters

The US Environmental Protection Agency (EPA) has invited nominations for a Small Business Advocacy Review Panel as the agency develops fine particle emissions limits for new residential wood heaters and other burning devices, such as wood stoves and hydronic heaters (outdoor wood heaters).

EPA says that more than 10 million wood stoves are used in the United States and that a major health threat from smoke comes from fine particles. Under the Clean Air Act, EPA issued standards for new residential wood heaters, including wood stoves, in

1988. A review in 2009 said that improvements in technology allow emissions to be better controlled than the existing standards require. EPA says it anticipates proposing revisions to the standards in 2011. The revisions could include improved regulation of wood heaters, along with new regulation of other residential devices that use solid biomass fuels.

US-EPA says only 19% of Trucks have been 'Reflashed' to Lower NOx Emissions

Only about 19% of the more than 1 million diesel trucks outfitted with illegal software in the 1990s have received updated software to reduce NOx emissions, the US Environmental Protection Agency says.

EPA and the Department of Justice held a conference call meeting on 14 June 2010 to review progress in implementing consent decrees reached in 1998 that required heavy-duty truck engine manufacturers to supply low emissions software updates to repair shops for use when an engine is rebuilt. The new software, or "chip reflash," replaces software that certain engine manufacturers installed in 1.1 million vehicles in violation of federal and state nitrogen oxide emissions standards, EPA says. The software enabled the engines to pass tests in the laboratory while increasing emissions of NOx on the open road. Under the consent decrees, the manufacturers were required to provide software that modifies the injection timing adjustment that caused the excess NOx emissions. The requirement expired in December 2009, but EPA says that the manufacturers will still need to offer the kits for those cases in which computers are reprogrammed as part of the rebuilds.

US-EPA proposes Amendments to Fuel Conversion Regulations

The US Environmental Protection Agency (EPA) is proposing to amend their alternative fuel conversion regulations to clarify and streamline the compliance process for manufacturers of conversion systems. The requirements would vary based on the age of the vehicle or engine being converted.

As part of the changes EPA is proposing several technical amendments to the exhaust and evaporative emissions testing requirements for both OEM and converted gaseous-fuelled vehicles. The amendments will allow flexibility in determining compliance with EPA's non-methane organic material standards, and will allow manufacturers of gaseous-fuelled vehicles to submit statements of compliance in lieu of test data to demonstrate compliance with exhaust formaldehyde and evaporative emissions standards.

Details of the new proposals are available at www.epa.gov/otaq/consumer/fuels/altfuels/420f10002.htm.

US-EPA delays decision on Ethanol Blends in Gasoline

US environmental regulators have delayed a decision on whether to allow an increase in the ethanol content of gasoline from 10 to 15%.

The Environmental Protection Agency had been expected to release a decision in July 2010, but carmakers have expressed concerns that the higher ethanol content could damage engines and some environmentalists reject ethanol as a green fuel because farming is energy intensive and can increase water pollution. Ethanol producers, on the other hand, are worried about a developing glut in ethanol as US laws require ethanol volumes to rise to 15 billion gallons annually by 2015 from 10.5 billion now.

The EPA has hinted that tests show modern cars can burn E15 (15% ethanol in gasoline) without difficulty but the Alliance of Automobile Manufacturers believes E15 can weaken performance of older engines. Many filling stations do not want the costs of changing pumps or adding more of them, and refiners and gasoline marketers fear they could be sued if owners of older cars mistakenly buy fuel not meant for their cars. If EPA does not approve E15 for older cars, it could mean the ethanol industry would have to convince more gasoline stations to sell a fuel containing 85 percent ethanol, used by flex-fuel cars.

SOUTH AMERICA

Brazilian Truckers sign Emissions Monitoring Accord

Fetranscarga, the federation of trucking companies in Brazil's Rio de Janeiro State, has signed an agreement under which members will have particulate matter emissions measured four times a year to check compliance with limits set by the National Environmental Council (CONAMA). Fetranspor, the federation that represents state bus companies, signed a similar accord in 2008.

The agreement was signed on 13 May 2010 with INEA, the enforcement arm of the State's Environmental Secretariat. CONAMA requires all trucks and buses to have their particle emissions measured annually by state agencies. A stricter 2007 Environmental Secretariat Regulation requires bus companies, trucking companies, and firms with truck fleets in Rio de Janeiro State to have particle emissions measured every three months. Those that meet standards get "green seal" window stickers. The rest must undergo maintenance and repair work to bring them within limits. INEA said that few, if any, trucking companies in the State were complying with the norm, and INEA did not have the manpower to monitor compliance with it.

Colombia to eliminate Import Fees on Clean Vehicles

Colombia will allow the importation of three types of low-emission vehicles duty-free, the Minister of the Environment announced on 10 June 2010. The policy will apply to electric, hybrid, and natural gas-powered cars, as well as buses and trucks. It will take effect as soon as the government issues the relevant decree. The current import duty is 35%. The policy initially will apply to a "first lot of 100" vehicles, the Minister said.

ASIA PACIFIC

Japan considers Stricter NOx Standards for Diesel Trucks and Buses

Japan is considering tougher rules for diesel-powered trucks and buses as well as for vehicles that use ethanol blends to reduce emissions of nitrogen oxides and fine particulates, an official with the Ministry of the Environment said on 23 June 2010.

On the previous day, the Ministry's expert panel on automobile emissions opened a 30-day public comment period on a proposal to reduce nitrogen oxide emissions from motor vehicles by 9% by 2020 and 35% by 2030, compared to 2009 levels, according to the Ministry's Environment Management and Technology Office. Under the proposal, diesel-powered trucks and buses would have to meet new standards for NOx emissions by the end of 2016. Tractors would have until the end of 2017 and vehicles less than 1.7 tons gross weight until the end of 2018. In addition to the tougher NOx emissions standards for diesel trucks and buses, the expert panel also proposed establishing emissions tolerance standards for vehicles that use E-10 fuel, (90% gasoline and 10% ethanol).

Once the public comment period ends, the proposal will be presented to the Ministry's Air Quality Policy Commission. After the Commission approves the standards, it will forward the proposal to the full Cabinet, which then will submit the plan as a piece of legislation to the Diet for consideration. The process is expected to take about two years.

China's Pearl Delta Cities Implement China IV Emissions Standards

The Environmental Protection Bureau of south China's Guangdong province has directed nine cities to begin implementing China IV motor vehicle tailpipe exhaust emissions standards from 1 June 2010, one year ahead of the national standards.

China's State Council and the Ministry of Environmental Protection (MEP) issued implementation guidelines to municipalities in

Guangdong on 17 May 2010, according to the notice on the Guangdong provincial website. Those guidelines called for the cities to allow the sale of only those light- and heavy-duty vehicles that meet China IV vehicle emissions standards from 1 June 2010 and to halt sales and registration of vehicles that do not meet those requirements. The specific standards being implemented are GB18352.3-2005 for light-duty vehicles and GB17691-2005 for heavy-duty diesel vehicles. The guidelines issued by the State Council and MEP also call on Guangdong province to "strengthen and standardise" emissions testing and monitoring of sales of vehicles to "ensure that the emission control performance meets national emissions standards." The implementation guidelines also call for cities in Guangdong to start using a yellow and green sticker system to identify older vehicles. The MEP issued nationwide guidelines last year on its yellow and green sticker labelling system. Under the programme, gasoline-powered vehicles that meet China I emissions standards or better may display green stickers. Diesel vehicles can use the green stickers if they meet China II emissions standards or better. All other vehicles below these two standards are allowed to display only yellow stickers.

China requiring NO₂ Measurement

It is reported from China that the nation's Vehicle Emission Control Center (VECC) has issued a complementary requirement for Type Approvals to the National IV legislation, affecting compression ignition engines and light-duty diesel vehicles when fitted with Diesel Oxidation Catalysts. It is reported that for CI engines, data should be provided on NO₂ emissions measured by chemiluminescence on the ESC cycle. For light-duty diesel vehicles, NO₂ emissions should be included in the report on pollutant emissions at normal temperatures.

China announces Subsidies for Plug-In Hybrids and Electric Cars

On 1 June 2010, China announced that it is to launch a pilot programme in five cities to provide subsidies to buyers of electric and hybrid cars.

Residents of Shanghai, Shenzhen, Hangzhou, Hefei and Changchun, would receive up to 50 000 yuan (€5860) in subsidies if they buy plug-in hybrid cars, the Ministry of Finance said on its website. The maximum subsidy for those buying fully electric cars will be 60 000 yuan (€7 030), the Ministry said. Rather than giving subsidies directly to consumers, the government will allocate the funds to carmakers, who will then reduce prices of the relevant models accordingly, the Ministry said. The level of subsidy

would be reduced after carmakers sold a total of 50 000 'green' cars. No start date was specified.

In addition to this programme in the five specified cities, nationwide subsidies of 3 000 yuan (approx. €350) would be available on purchases of cars with 1.6-litre engines or smaller and that consume 20% percent less fuel than current standards. The programme is estimated to cover more than 4 million such vehicles by 2012, the National Development and Reform Commission said on its website.

Since last year the government has been offering subsidies for purchases of cleaner buses, as part of another pilot programme in 13 cities. The government will also allocate funding for the construction of charging stations and battery recovery networks in the pilot cities, the Finance Ministry added.

China announces Guidelines for Alternative-Fuelled Vehicles

The Chinese Ministry of Industry and Information Technology (MIIT) has revealed technical guidelines for the local production of alternative-fuel vehicles in the country, reports *China Securities Journal*. Under the regulations, pure-electric vehicles should have a maximum speed of more than 80 km/h and a driving range of more than 100 km. The vehicles should use core components, including batteries, that have a shelf life of more than 100 000 km, and a complete charge should take less than seven hours. Up to 80% of a charge must be available after less than 30 minutes of charging. In addition, pure-electric vehicles must consume less than 0.16 kWh/km electric energy.

Beijing Environmental Statement for 2009

In the recently-released Beijing Environmental Statement 2009, last year's eco-environment was rated "good" by the city's Environmental Protection Bureau. Statistics from the bureau show the city had a record 285 blue-sky days, about 78% of the whole year, which is 11 days more than in 2008. The report also noted that emissions of major air pollutants were decreasing.

However, the city's air quality was ranked 28 out of 31 provincial capitals and municipalities nationwide last year, according to the annual report on the environmental development of China. The percentage of inhalable particles is 21% higher than the national grade II urban air quality standard, with the frequency of acid rain 25% higher on average. The total number of cars in Beijing could hit five million by the end of 2010. A spokesman for the Beijing Environmental Protection Bureau said that they will try to remove heavily polluting vehicles from the streets and might expand the no-car-day ban.

The bureau has also begun a one-month intensive crack-down on some of the city's vehicles to counter worsening pollution. The bureau said it would mainly focus on heavy freight vehicles, construction tippers, "yellow label" vehicles - those that fail to meet the Euro I standard for exhaust emissions - and trucks registered outside the capital. More than 100 remote sensing monitoring points will be set up to check the emissions of passing vehicles.

Hong Kong, China, targets Emissions from Off-Road Vehicles

The government of the Hong Kong Special Administrative Region (China) is seeking comment on a proposal released on 5 May 2010 for controlling emissions from non-road mobile machinery (NRMM).

The measure would cover imported and Hong Kong-manufactured off-road vehicles powered by internal combustion engines, such as those in use at airports, shipping terminals, and construction sites. Vehicles already in use would not be subject to the requirements at this time. Importers and manufacturers would be required to seek Environmental Protection Department approval for vehicles intended to be used in Hong Kong. The government estimates about 13 500 such vehicles are currently operating in Hong Kong, most of which were imported and are being used in construction. These vehicles are not currently subject to air pollutant emissions controls. They contribute about 7% of Hong Kong's NOx emissions and 11% of respirable suspended particle emissions, the government said.

Speech by the Transport Commissioner for Hong Kong, China

In a speech at the Environmentally Friendly Transport System Seminar organised by the Chartered Institution of Highways and Transportation on 5 June 2010, the Commissioner for Transport for Hong Kong, China, Mr Joseph Lai, said that Diesel vehicles are a major source of street-level air pollution in Hong Kong. To reduce their emissions, the Government has been promoting and exploring the use of cleaner fuels and transport modes since 1999 through incentive programmes to encourage owners to replace diesel taxis with LPG taxis and to replace diesel light buses with LPG or electric ones. Over 99.9% of the taxi fleet and 55% of the public light bus fleet have now been converted to the use of more environmentally friendly fuel. In addition, all franchised buses have switched to Euro V diesel since the end of 2007. The use of electric vehicles or environmentally friendly vehicles is being promoted through waiving or reducing the first registration tax of these vehicles, and the provision of battery charging facilities in selected Government car parks. All newly registered heavy-duty vehicles,

including franchised buses, must now meet Euro IV emissions standards and a clause in all bus franchises requires the adoption of latest commercially available and proven environment-friendly technologies and products on newly acquired buses to reduce exhaust emissions as far as reasonably practicable.

Hong Kong, China, publishes 10 ppm Fuel Regulation

The Air Pollution Control (Motor Vehicle Fuel) (Amendment) Regulation 2010 was published in the Hong Kong Government Gazette on 7 May 2010. The amendment tightens diesel and unleaded petrol specifications to Euro 5 standards, reducing the maximum sulfur content from 50 ppm to 10 ppm.

A spokesman for the Environmental Protection Department said that since December 2007, all local petrol filling stations have been offering exclusively Euro 5 diesel. The import volume of Euro 5 petrol increased to about half of total petrol imports in 2009 from 10% in 2008, indicating that Euro 5 petrol has gradually become more widely available, he said.

The Amendment Regulation will be tabled at the Legislative Council for negative vetting on 12 May 2010. Subject to the approval of the Council, the amendments will take effect on 1 July 2010.

Rising Number of Motor Vehicles in India contributes to Poorer Air Quality

A rising number of vehicles and poor road planning have led to acute deterioration of air quality in most Indian cities, the federal Central Pollution Control Board said in a report released on 12 May 2010.

In major metropolitan areas like Delhi and Mumbai, vehicles account for 70% of all CO emissions, 30 to 40% of NO_x emissions, and 30% of particulate matter in the air, according to the report, *Status of the Vehicular Pollution Control Program in India*. Two-thirds of the vehicle pollution in major cities comes from two-wheeled vehicles, the Board said.

While the report said "air quality can be improved through a combination of technical and non-technical measures, legislative reforms, institutional approaches and market-based instruments," the country faces a number of unique challenges. While vehicles older than 10 years make up only one-third of all vehicles in India, they contribute 60% of vehicular air pollution, the report said. In addition, cities generally lack a robust enforcement and monitoring system.

Delhi to increase Vehicle Road Tax

The government of the National Capital Territory of Delhi has announced that it will raise the registration fee, or road tax, for cars and two-wheel vehicles

starting on 1 June 2010 in an effort to discourage vehicle use and improve air quality. The tax is paid once at the time of registration.

The Cabinet of Ministers decided that owners of two-wheel vehicles costing more than 25 000 rupees (€437) will pay a 4% tax. Owners of less expensive models will pay 2%. Owners of cars costing up to Rs 6 lakh (approx. €10 500) will also pay 4%, twice the tax they have been paying. Owners of mid-range cars costing Rs 6 lakh to Rs 10 lakh (approx. €17 500) will pay 7%. More costly cars will be taxed at 10%.

This move is part of the Delhi government's efforts to improve air quality in the city ahead of the Commonwealth Games in October this year. The government also has proposed levying congestion charges on vehicles entering Delhi, though no final decision has been made.

International Centre for Automotive Technology in India

On 4 June 2010, India's Minister for Heavy Industries & Public Enterprises, Vilasrao Deshmukh, laid the Foundation Stone for the new campus of the International Centre for Automotive Technology (iCAT) at Manesar, India.

The project is part of the ongoing National Automotive Testing and R&D Infrastructure Project (NATRiP) of the ministry. The centre will provide state of the art testing, validation and R&D facilities to the automotive industry in India's northern hub. The new facilities are to include a powertrain laboratory, engine dynamometers, an emissions laboratory with Euro V capability, and vehicle test tracks.

Indonesian Air Quality worsens

Indonesia's Meteorology, Climatology and Geophysics Agency (BMKG) says that air quality in most Indonesian cities continued to worsen last year.

The agency measures dust, PM₁₀, NO₂, SO₂ and ozone. The BMKG report shows PM₁₀ concentrations in Bandung, Palembang, Tangerang and Jakarta exceeded tolerable levels set by the government. The Deputy Environment Minister for Technical Development and Capacity Building said the massive increase in motorcycles on the road had a big impact on air pollution.

The Environment Ministry has announced that it is to increase the standards for its Adipura Awards, now requiring cities to have cleaner air, in a bid to help reduce greenhouse gas emissions and air pollution. In July 2010 the Ministry will issue a decree on the new criteria for Adipurah, to replace the existing regulation issued in 2006.

New Zealand Government proposes to Relax PM₁₀ Air Quality Standards

On 10 June 2010, the New Zealand government proposed to relax national ambient air quality standards by allowing a greater annual number of instances when limits for particulate matter less than 10 microns in diameter (PM₁₀) can be exceeded. The government had announced a review of air quality standards in June 2009, following industry complaints about the economic impact of current regulations.

In New Zealand, domestic heating (mainly log burners and open fires), not industry, is the main source of air pollution. Environment Minister Nick Smith said the existing standard of only one exceedance per year is "unrealistic and would require banning home log burners and industries in communities where air quality is generally very good." "The existing standard is also unfair in severely punishing businesses when the vast bulk of pollution comes from home fires and motor vehicles," Smith said.

The main recommendation in the discussion document is to increase from one to three the number of times per year that the limit value for PM₁₀ may be exceeded. The current limit is an average of 50 µg/m³ over a 24-hour period. Other options under consideration are a deferral of the 2013 compliance deadline to 2018 and a requirement for regional councils to report to the government their progress on airshed implementation plans. Public submissions on the proposal must be received by 9 July 2010.

AFRICA

Unleaded Fuel for Tunisia, Lower Sulfur in Tunisia, Kenya and Tanzania

The May 2010 edition of the UN Environment Programme's 'Partnership for Clean Fuels and Vehicles' Newsletter records that Tunisia has formally announced the phase out of leaded fuel by January 2010 and the adoption of a 50 ppm sulfur standard for gasoline and 10 ppm for gasoil. The country will, however, continue to market gasoil with a maximum of 3000 ppm sulfur until later next year.

UNEP also reports that Kenya and Tanzania have formally adopted a lower sulfur fuel standard of 500 ppm for all imported fuel from the current standard of 5000 ppm. Both standards were approved in April 2010 and are in the process of implementation. For Kenya, only imported fuels into the country will be subject to the 500 ppm standard until the Kenya Petroleum Refineries Limited is upgraded in the next four years to produce lower sulfur fuels.

UNITED NATIONS

Retirement of GRPE Chairman

After 37 years as chairman of the UN-ECE's Working Party on Pollution and Energy (GRPE), M. Bernard Gauvin announced at the 60th session that he would not be standing for re-election.

M. Gauvin has chaired all sessions of GRPE (or GRPA as it was originally known) after the first one and during his tenure has guided the development of UN-ECE emissions regulations for cars and light commercial vehicles, for heavy-duty, tractor and NRMM engines and for mopeds and motorcycles.



The process started with ECE Regulation No.15 covering emissions of light-duty vehicles, published in 1971 (later replaced by Regulation No.83). The original Regulation No.15 included only the well-known urban (ECE) test cycle, and limits for a typical mid-sized car equated to approximately 33 g/km CO and 2.3 g/km HC, with no NO_x or PM limits. More recently the 1998 UN agreement has resulted in the introduction of global technical regulations (gtr) and under M. Gauvin's chairmanship, GRPE has been one of the leading groups in their development. Five of the eleven current gtr concern emissions and work is under way to develop the light-duty harmonised regulation (WLTP).

M. Christophe Albus of Germany's Federal Ministry of Transport, Building and Urban Affairs (BMVBS) will replace M. Gauvin as chairman. He is a regular member of the German delegation to GRPE and has considerable experience, leading GRPE's work on topics such as the motorcycles (WMTC) development and hydrogen and fuel cell vehicles (HFCV).

GENERAL

Global NGO on Shipping launched

A global coalition to work specifically on the environmental, safety and human effects of shipping has been launched by eight NGOs including Transport & Environment (T&E).

The Clean Shipping Coalition (CSC) is intended to help its members to work more effectively with the decision-making structure of the International Maritime Organisation (IMO). It aims to promote 'policies aimed at the protection and restoration of the marine and atmospheric environment that are consistent with the safe operation of ships, sustainable development, social and economic justice, and human health'. It has launched a website, www.cleanshipping.org.

RESEARCH SUMMARY

Health Effects of Emissions

Human Health Risk for Inhaled Manganese

According to Health Canada, only a small percentage of an oral dose of manganese enters systemic circulation; conversely, inhaled manganese enters systemic circulation directly, making the manganese available for distribution to and accumulation in the body's tissues, including the brain. Manganese delivery to the brain can occur across the blood-brain barrier, through the choroid plexus and via direct olfactory transport. In the case of the latter, inhaled manganese deposited on the olfactory epithelium can be transported directly along the olfactory system to the olfactory bulb within the brain, providing a direct interface between the nervous system and the external environment.

Based on data from toxicology studies with non-human primates and rodents, Health Canada noted that it can be hypothesized that a number of interrelated processes are set in motion as manganese intoxication progresses. The end result of these toxic processes is cytotoxicity and selective neurodegeneration in regions of the brain that accumulate manganese, in turn leading to an alteration in CNS neurotransmission that gives rise to the behavioural effects associated with manganese intoxication.

This review and analysis concludes that the new Health Canada reference concentration for inhaled manganese is 0.05 µg/m³ in PM_{2.5}. This value reflects the concentration to which the general population, including sensitive subgroups, can be exposed for a lifetime without appreciable harm.

Source: Human Health Risk Assessment for Inhaled Manganese, Health Canada Publication 100122, (2010), ISBN: 978-1-100-15221-9.

Air Pollution Associated With Heart Disease

People exposed to air pollution face greater risk of heart attack, stroke and cardiovascular death, the American Heart Association (AHA) has warned. The AHA pointed to fine particulate matter, PM_{2.5}, as the most evident threat because its tiny size makes it more likely to infiltrate even the smallest airways. As a result, fine particulate matter "should be recognised as a 'modifiable factor' that contributes to cardiovascular morbidity and mortality," the AHA report said.

Those at highest risk from PM_{2.5} exposure include the elderly, people with existing heart diseases, and possibly those with diabetes, according to the report.

Source: Brook et al. Particulate matter air pollution and cardiovascular disease. *Circulation* 2010; No. 121, pp.2331-2378 [doi:10.1161/CIR.0b013e3181d8e1](https://doi.org/10.1161/CIR.0b013e3181d8e1).

Study on Diesel Exhaust and Neuro-inflammation

In this study, the association between exposure to diesel engine-derived air pollution and neuro-inflammation was investigated, with various loci of the brain being separately analysed. The results indicate that different brain regions may be uniquely responsive to changes induced by exposure to diesel exhaust.

Source: Gerlofs-Nijland et al, Effect of prolonged exposure to diesel engine exhaust on proinflammatory markers in different regions of the rat brain; *Particle and Fibre Toxicology*, Vol. 7 No.12 www.particleandfibretoxicology.com/content/7/1/12.

Cardiac and Vascular Changes with PM_{2.5} Exposure

This study examined the effects of short-term exposures to ambient PM_{2.5} on markers of systemic inflammation, coagulation, autonomic control of heart rate, and repolarisation in adults with type 2 diabetes. The authors conclude that exposure to elevated levels of PM_{2.5} alters ventricular repolarisation and thus may increase myocardial vulnerability to arrhythmias. Exposure to PM_{2.5} also increases systemic inflammation. Characteristics associated with insulin resistance or with oxidative stress were shown to enhance the association.

Source: Schneider et al, Association of cardiac and vascular changes with ambient PM_{2.5} in diabetic individuals; *Particle and Fibre Toxicology*, Vol.7 No.14, [doi:10.1186/1743-8977-7-14](https://doi.org/10.1186/1743-8977-7-14).

No Effect of Diesel Exhaust on Fibrin Clot Structure

Exposure to urban particulate matter has been associated with an increased risk of cardiovascular disease and thrombosis. In this study, researchers examined the effects of transient exposure to diesel particles on fibrin clot structure of healthy individuals. The authors say that the data show that there are no prothrombotic changes in fibrin clot structure in young, healthy individuals exposed to diesel exhaust.

Source: Metassan et al, Fibrin clot structure remains unaffected in young, healthy individuals after transient exposure to diesel exhaust; *Particle and Fibre Toxicology*, Vol.7 Iss.17, [doi:10.1186/1743-8977-7-17](https://doi.org/10.1186/1743-8977-7-17).

Assessment of Exposure

Ultrafine Particle Concentrations in Cars

A new paper from Australian Universities presents the results of alternately-measured on-road and in-vehicle ultrafine (<100 nm) particle (UFP) concentration for five passenger vehicles that comprised an age range of 18 years. The authors conclude that under certain conditions, in-cabin UFP exposures incurred during tunnel travel may contribute significantly to daily exposure. The UFP exposure of automobile occupants appears strongly related to their choice of ventilation setting and vehicle.

Source: Knibbs, de Dear and Morawska; Effect of Cabin Ventilation Rate on Ultrafine Particle Exposure Inside Automobiles; *Environmental Science & Technology*, Vol. 44 No.9, pp 3546-3551, [doi: 10.1021/es9038209](https://doi.org/10.1021/es9038209).

Air Quality

Effects of Controls on Ozone Precursors in Europe

In this study, the researchers modelled the impact of the main influences on the formation of ground-level ozone for 20 years (from 1990) in central England. The focus was on four issues, namely, the actual reductions of NO_x and VOC precursor emissions achieved; the complex relationship between NO_x and VOCs emissions and ozone formation; the long range transport of ozone in the atmosphere across the North Atlantic Ocean; and the target levels of precursor emissions set in international policy negotiations.

The results suggest that, over central England, short-term episodes of peak ozone levels between 1990 and 2007 decreased significantly, but annual ozone levels rose slightly during the same period. The researchers suggest reasonable policy targets to reduce ozone levels should be reductions of NO_x by 60% and VOCs by about 30%, or about 30% for VOC and NO_x combined, beyond 2010.

Source: Derwent et al., Ozone in Central England: the impact of 20 years of precursor emission controls in Europe; *Environmental Science & Policy*, Vol.13 Iss.3 pp.195-204. [doi: 10.1016/j.envsci.2010.02.001](https://doi.org/10.1016/j.envsci.2010.02.001).

Trends in London Air Quality Data

This paper analyses hourly measurement data of air pollutants from a background site in central London from 1996 to 2008 (particle number count from 2001).

CO, NO and NO₂ show a typical traffic-associated pattern. Particle number count and PM₁₀ show a similar cycle, but with smaller amplitude. Ozone has an annual cycle with a maximum in May, influenced by the spring maximum in background ozone, but the diurnal and weekly cycles are dominated by losses through reaction with nitric oxide. Particle number count shows a minimum corresponding with maximum air temperatures in August, whereas the CO, NO, NO₂ and SO₂ show a minimum in June/July. SO₂, NO and NO₂ show clear downward trends over the measurement period, PM₁₀ declines initially before levels stabilised, and ozone concentrations increase.

Source: Bigi & Harrison, Analysis of the air pollution climate at a central urban background site; *Atmospheric Environment*, Vol.44 Iss.16 pp.2004-2012, [doi: 10.1016/j.atmosenv.2010.02.028](https://doi.org/10.1016/j.atmosenv.2010.02.028).

Monitoring Ultrafine Particles in Korea

Data obtained from one week of intensive ultrafine particle monitoring at an urban site in Seoul, Korea during the winter of 2003 shows that the diurnal variations of size-segregated particle concentrations for ultrafine particles (20-100 nm) and accumulation mode particles (100-600 nm) were very similar.

Source: Hung et al., Ultrafine particle and gas contamination of urban air in Seoul, Korea, during winter. *International Journal of Environment and Pollution*, Vol.41, No.1-2, pp.3-20, [doi: 10.1504/IJEP.2010.032242](https://doi.org/10.1504/IJEP.2010.032242).

Ambient NO₂ Declining in Los Angeles

A new paper describes ground and space-based measurements of spatial and temporal variation of NO₂ in four California metropolitan regions. Observed decreases in Los Angeles and the surrounding cities are 46% on weekends and 9%/year from 2005-2008.

Source: Russell et al, Space-based Constraints on Spatial and Temporal Patterns of NO_x Emissions in California, 2005-2008; *Environmental Science & Technology*, Vol.44, No.9, pp.3608-3615, [doi: 10.1021/es903451j](https://doi.org/10.1021/es903451j).

Characterisation of Particulate

Particulate Matter from Sites across Europe

This study analysed the physical and chemical characteristics of particulate from 60 sites. The results suggest there is no single ratio between PM_{2.5} and PM₁₀ mass concentrations, and that PM mass cannot be directly related to particle numbers.

PM₁₀ and PM_{2.5} concentrations and particle numbers generally increased from remote rural background through to kerbside sites. However, in Central Europe, PM_{2.5} levels were comparable in rural and urban sites and concentrations at kerbsides were not particularly higher compared with urban sites. At none of the sites did the total particle number of PM_{2.5} increase in direct proportion to PM mass. The contribution of nitrates to PM₁₀ and PM_{2.5} increases with PM mass in almost every urban site and some other locations. To limit the number of PM₁₀ exceedences, the authors suggest efforts should be made to reduce NO_x emissions.

Source: Putaud et al., A European aerosol phenomenology - 3: Physical and chemical characteristics of particulate matter from 60 rural, urban, and kerbside sites across Europe. *Atmospheric Environment*, Vol. 44, pp.1308-1320, [doi: 10.1016/j.atmosenv.2009.12.011](https://doi.org/10.1016/j.atmosenv.2009.12.011).

Engine Development and Emissions Measurement

Particle Number Emissions from US 2007 Diesels

The effect of a diesel particle filter-equipped 2007 production engine technology on particle number emissions has been studied in a new paper from Southwest Research Institute. On a cycle average basis, the particle number concentration emitted from 2007 engine technology was at least 90% lower than that emitted from 2004 engine technology. However, on a real time basis, there can be localized storage and release events as well as infrequent active regeneration events that make the particle number emissions one to more than two orders of magnitude higher than the baseline real time level at low exhaust temperature, where no storage and release or regeneration occurs.

Source: Khalek, Bougher, Shimpi and Tennant, Particle number measurements from filter-equipped 2007 on-highway diesel truck engines; *102nd Air and Waste Management Association's Annual Conference and Exhibition Proceedings*, Vol.2 pp.1265-1270.

Up to 60% of Diesel NO_x is Emitted as NO₂

Recent research from the University of Denver involved the measurement of on-road emissions measurements of reactive nitrogen compounds from light-duty vehicles in three California cities. The ratio of NO₂ to NO in new diesel vehicles appeared to be undergoing large increases. A small fleet of 2007 diesel ambulances measured in Fresno was found to have more than 60% of their emitted NO_x as NO₂.

Source: Bishop et al., On-Road Emission Measurements of Reactive Nitrogen Compounds from Three California Cities; *Environmental Science & Technology*, Vol.44, No.9, pp3616-3620, doi: [10.1021/es903722p](https://doi.org/10.1021/es903722p).

Measurements of Ship NO₂ and SO₂

In August-September 2006, as part of the 2nd Texas Air Quality Study, NO₂ and SO₂ emissions from the Houston Ship Channel and Texas City industrial areas were quantified using mobile mini-differential optical absorption spectroscopy instruments.

Source: Rivera et al., Quantification of NO₂ and SO₂ emissions from the Houston Ship Channel and Texas City industrial areas during the 2006 Texas Air Quality Study; *Journal of Geophysical Research - Atmospheres*, Vol.115 D08301. 10pp, doi:[10.1029/2009JD012675](https://doi.org/10.1029/2009JD012675).

Particle Emissions from a Marine Diesel Engine

Researchers from PSI, MAN and Germanischer Lloyd measured PM emissions from a 4-stroke medium-speed marine diesel engine for load conditions from 10% to 110% in test rig studies using heavy fuel oil (HFO). Emission factors for particle number, particle mass, and chemical compounds were determined.

Source: Petzold et al., Physical properties, chemical composition, and cloud forming potential of particulate emissions from a marine diesel engine at various load conditions; *Environmental Science and Technology*, Vol. 44 Iss.10 pp.3800-3805, doi: [10.1021/es903681z](https://doi.org/10.1021/es903681z).

Natural Gas Bus Engine Particle Number Emissions

In this study from Queensland University of Technology and the Paul Scherrer Institute, it was found that although particle number (PN) emissions from CNG buses are significantly lower than from diesel buses at low engine power, they become comparable at high power. During acceleration under heavy load, PN emissions from CNG buses are an order of magnitude higher than from diesel buses.

Source: Jayaratne et al, Critical analysis of high particle number emissions from accelerating compressed natural gas buses; *Environmental Science and Technology*, Vol.44 Iss.10 pp.3724-3731, doi: [10.1021/es1003186](https://doi.org/10.1021/es1003186).

FORTHCOMING CONFERENCES

Hybrid and Electric Vehicles: Powertrain Development, Technology and Trends

14 July 2010, London, UK

Details at <http://awbriefing.com/events/10-07-14.php>

This conference will explore current industry trends in drivetrain electrification as well as analyse key areas for development, technology and market growth.

14th ETH Conference on Combustion Generated Nanoparticles

1-4 August 2010, Zürich, Switzerland

Details at www.lav.ethz.ch/nanoparticle_conf

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

VPPC 2010: Vehicle Power and Propulsion Conference

1-3 September 2010, Lille, France

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

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

Diesel Emissions Conference India 2010

8-9 September 2010, New Delhi, India

Details at

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

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

22nd International AVL Conference 'Engine & Environment:

9-10 September 2010, Graz, Austria

Details at www.avl.com

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

Heavy Duty Diesel Emissions Control Symposium

21-22 September 2010, Gothenburg, Sweden

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

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

Keramik in der motorischen Abgas-nachbehandlung

23 September 2010, Dresden, Germany

Details at www.ikts.fraunhofer.de/veranstaltungen/abgas_nachbehandlung.jsp

This Industry Day will cover the current status and trends from the perspective of ceramic design and manufacturing process. There will also be the opportunity to see a hot gas test rig in operation. The rig allows analysis of the structural behaviour of ceramic components in the hot gas and thermal cyclic loading programmes.

The Future of Biodiesel in Europe

27-28 September 2010, Brussels, Belgium

This event will allow stakeholders to discuss critical issues affecting the European biodiesel market, including policy and market developments, quality and sustainability concerns, and technology developments that will impact the production and use of biodiesel.

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

27-30 September 2010, Detroit, Michigan, USA

Details at www.orau.gov/deer2010

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

23rd World LP Gas Forum

28 September - 1 October 2010, Madrid, Spain

Details at www.wlpgasforum-aeapl2010.com

IFZ 8th International Motorcycle Conference

4-5 October 2010, Cologne, Germany

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

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

19th Aachen Colloquium "Automobile and Engine Technology"

4-6 October 2010, Aachen, Germany

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

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

SAE 2010 Commercial Vehicle Engineering Congress and Exhibition

5-6 October 2010, Rosemont, Illinois, USA

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

13th Annual Central and Eastern European Refining and Petrochemicals Roundtable

12-14 October 2010, Budapest, Hungary

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

ICAT'10 – International Conference on Energy and Automotive Technologies

5 November 2010, Istanbul, Turkey

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

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

23-24 November 2010, Mannheim, Germany

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

The conference will cover new engines, emissions, aftertreatment, fuel injection, supercharging and

cooling, combustion process, fuels, lubricants and friction and alternative propulsion.

Monitoring Ambient Air 2010: New Air Quality Measurement Technologies

14-15 December 2010, London, UK

Details at www.aamq-rsc.org.

This meeting will focus on new measurement challenges, including new technologies for air pollution measurement, small sensors for dense urban networks or measurement of personal exposure, real-time measurement of PM components or physical properties, improved measurement of organic particles and gases, measurements for source apportionment and the quality assurance of new measurement methodologies.

Deadline for abstracts 16 July 2010

International Advanced Mobility Forum

8-9 March 2011, Geneva, Switzerland

2011 SAE World Congress

12-14 April 2011, Detroit, Michigan, USA

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

32nd Vienna Motor Symposium

5-6 May 2011, Vienna, Austria