AECC

NEWSLETTER

March - April 2011

INTERNATIONAL REGULATORY DEVELOPMENTS

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EUROPE

EC Review of EU Air Quality Policy

The European Commission has issued a staff working paper on "the implementation of EU Air Quality Policy and preparing for its comprehensive review."

The document says that current policy efforts, at EU and national level, have not fully delivered the expected results. Limit and target values of PM, NO_2 and ground-level ozone are exceeded in many urban areas and global emissions of NOx are not decreasing as much as expected. One of the reasons is the increase in transport volume, the gap between regulated emissions limits in type approval and the "real world" emissions and the slower turnover of vehicles fleets (meaning that older vehicles which are often more polluting are staying on the road for longer). Prompt action is required to further reduce air emissions linked to the most problematic pollutants. Preparatory work to update the Thematic Strategy and associated measures such as the review of the Ambient Air Quality Framework Directive and the revision of the National Emission Ceilings Directive is to resume without delay with a view of adopting an up-to-date clean air strategy package no later than 2013.

There will be a first public online consultation in 2011 and a stakeholder group is to be established in June 2011 to be the main platform for inputs. Short-term actions to be taken include addressing 'real world' emissions; implementing the Directive on the promotion of clean and energy-efficient vehicles; EU-wide electro-mobility projects; promoting retrofit; updating Directive 1999/32/EC to introduce the marine fuel sulfur limits agreed by IMO; and revision of the UN-ECE Gothenburg Protocol. Major initiatives likely to contribute to air quality improvements such as the White Paper on Transport as well as other specific Commission actions (e.g. non-road mobile machinery) are already included.

In a section on creating co-benefits with climate change, the Commission says that "There is now sufficient evidence that certain constituents of the group of PM pollutants (e.g. black carbon) have a high 'radiative forcing potential' thereby contributing to the warming up of the atmosphere in the short term. A reduction of these pollutants within the next 10-15 years would help achieving the UNFCCC's and EU's long term objective of limiting the global temperature increase to less than 2°C.

Parliament Environment Committee votes on NRMM & Tractors Flexibility Proposals

On 16 March 2011, the Environment Committee of the European Parliament adopted its reports on two Commission proposals to increase flexibility provisions for NRMM engines and for tractor engines.

The flexibility provisions allow manufacturers to place on the market a number of engines that meet the previous emissions stage (IIIA) for a limited period of time. The Committee agreed to support only a lower figure than that proposed by the Commission. This would result in the flexibility allowance increasing from the current 20% of a manufacturer's annual sales of the equipment up to 30% for NRMM and 35% for tractors, for the duration of Stage IIIB or a maximum of 3 years.

The tables for the alternative fixed numbers of engines were not modified compared to the Commission proposal. Locomotives (but not railcars) would be given some flexibility provisions up to 20 propulsion engines, plus 10 of the UK type. Such flexibility is subject to technical inability to fit a Stage IIIB engine. Regarding replacement engines for railcars and locomotives in the first 3 years of Stage IIIB, pre-IIIA and IIIA engines should be replaced by at least IIIA engines, if fitting a IIIB engine is proven to be technically infeasible or economically non-viable.

The adopted NRMM report also contains a new recital stating that the on-going revision of Directive 97/68/EC should propose the establishment of a Stage V aligned with Heavy-duty Euro VI standard; should introduce a PN requirement for all engine categories; should define a comprehensive approach to promote the retrofit of the existing NRMM fleet, on the basis of UN-ECE developments; should introduce a method of periodical testing of NRMM to establish whether their emissions performance complies with the value given at registration; and should look into harmonising rail emissions standards with US EPA requirements. The adopted report on tractors contains a new recital stating that current emissions limits should be tightened with respect to ultrafine black carbon particles by implementing a particle number criterion in the next emissions stage.

These reports will now be voted in the Parliament's plenary session in June 2011.

European Council agrees CO_2 Standards for Light Commercial Vehicles

On 31 March 2011 the Council of the European Union approved the CO_2 emissions standards for light commercial vehicles.

The Regulation, which has already been agreed by the European Parliament, introduces a limit of 175 g/km for the average CO_2 emissions from light commercial vehicles of up to 3.5 tonnes. It will apply to small vans of average mass while specific targets for individual vehicles will vary according to their weight. The target will be phased in between 2014

and 2017: in 2014, 70% of a manufacturer's fleet will have to comply with it, rising to 75% in 2015 and 80% in 2016. From 2017, full compliance will be required from carmakers. A long-term target of 147 g/km in 2020 has also been included. The Council says that the modalities for reaching the target are to be established by 1 January 2013 in a revision of the regulation.

To incentivise investment in new technologies, from 2014 onwards producers will have to pay a penalty if their fleet fails to meet the target. As in the legislation for cars, the penalty will depend on the amount by which manufacturers exceed the target. A maximum penalty of €95 per vehicle for exceeding the target has been agreed.

By 2014, the Commission may propose to extend the limits to minibuses and vans of up to 12 tonnes.

Commission White Paper on Transport

On 28 March 2011 the European Commission issued its new White Paper on EU transport policy, "*Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system".*

Ten goals are envisaged as part of a strategy to reduce greenhouse gas emissions from transport by 60%. The White Paper says that the use of conventional internal combustion engines in cities should be halved by 2030 and ended entirely by 2050. City freight systems ought to be "essentially CO_2-free" by 2030. 50% of road freight travelling over 300 km should shift to rail or waterborne transport by 2050.

The White Paper leaves much of the detail on cleaner modes of transport to a strategic transport technology plan due later this year and a clean transport systems strategy planned for 2012. However some 25 policy measures, designed to help implement the goals, are listed in an annex. These include an EU-wide framework for urban congestion charging and traffic restriction schemes, harmonisation of vehicle labelling rules across Member States including the development of new labels for motorbikes, fuel taxation, and research and innovation. All EU countries should be required to charge lorries for infrastructure costs (under existing Eurovignette legislation, it is up to the Member States to decide whether to impose such charges). By the end of the decade, the Commission would propose to extend this requirement to the entire road transport sector and rail. Charging for pollution, congestion and noise would also become mandatory.
White Paper, Commission staff working document and Impact Assessment can be downloaded from http://ec.europa.eu/transport/strategies/2011_white_paper_en.htm.

EC Consultation on EU Transport Technology Plan

The European Commission has launched a public consultation on its approach to the research and deployment of future transport technologies. Responses will feed into a strategic transport technology plan (STTP) to be published this summer.

The STTP will cover the full "innovation chain", says the Commission, and should help achieve some of the goals set by the transport White Paper (see above). The consultation asks which technologies the STTP should focus on for the period to 2030. Options include systems for traffic management and freight optimisation, alternative fuels, and changes to vehicle design. It also asks which mechanisms should be used to encourage technology development. These could include some form of financial support or incentive for research, market mechanisms, or the centralised coordination of existing efforts.

The consultation is available at http://ec.europa.eu/transport/research/consultations/2011_05_28_sttp_en.htm.

European Commission Roadmap for a Low Carbon Economy by 2050

On 8 March 2011 the European Commission published its Roadmap for moving to a competitive low carbon economy in 2050.

The document notes that the EU is currently on track to meet two of its targets for 2020 (reducing greenhouse gas emissions by 20% and increasing the share of renewables to 20%), but will not meet its 20% energy efficiency target by 2020 unless further efforts are made. For the future beyond 2020, the Commission's analysis of different scenarios shows that domestic emissions reductions of the order of 40% and 60% below 1990 levels would be the cost-effective pathway by 2030 and 2040, respectively.

Regarding transport, the Commission says that technological innovation can help the transition to a more efficient and sustainable European transport system by acting on 3 main factors: vehicle efficiency through new engines, materials and design; cleaner energy use through new fuels and propulsion systems; and better use of networks and safer and more secure operation through information and communication systems. The White Paper on Transport will, the Commission says, provide a comprehensive and combined set of measures to increase the sustainability of the transport system.

Sustainable biofuels could be used as an alternative fuel especially in aviation and heavy-duty trucks, with strong growth in these sectors after 2030. In case electrification would not be deployed on a large-scale, biofuels and other alternative fuels would need to play

a greater role to achieve the same level of emissions reduction in the transport sector.

The Commission also says that action to reduce greenhouse gas (GHG) emissions would importantly complement existing and planned air quality measures resulting in significantly reduced air pollution. The combined effect of GHG reductions and air quality measures would bring about more than 65% lower levels of air pollution in 2030 compared to 2005. The Commission's roadmap is available at http://ec.europa.eu/clima/documentation/roadmap/docs/com_2011_112_en.pdf.

Commission Study on the Motor Vehicles Type Approval Directive 2007/46/EC

Risk & Policy Analysts (RPA) has been asked by DG Enterprise and Industry to carry out a study into the operation of Directive 2007/46/EC, the Directive that established a legal framework for the approval of motor vehicles and for components and separate technical units intended for such vehicles.

The study involves two modules: an ex-post evaluation of the current legal framework for the type-approval of motor vehicles, and following this an Impact Assessment on a possible policy initiative aimed at enhancing the implementation of the internal market legislation relating to motor vehicles. As part of the study, RPA will be launching a data collection exercise by means of a web-based questionnaire and is urging companies to participate.

Report on GHG Emissions from Heavy-duty Vehicles

DG Climate Action has released a report from AEA Technology and Ricardo on the "Reduction and Testing of Greenhouse Gas (GHG) Emissions from Heavy Duty Vehicles – Lot 1: Strategy".

The report says that overall it is clear that tackling the on-going trend in the increase of fuel consumption and GHG emissions from heavy-duty vehicles (HDVs) will be difficult in comparison to light-duty vehicles. The HDV market is complex with significant diversity in final vehicle specification and performance/use. It would appear that the most meaningful metric of fuel efficiency or GHG emissions for HDVs will be in relation to the work performed (fuel consumption per unit payload carried, i.e. weight in tonnes, volume in m^3 or passengers). The policy assessment work carried out suggests that any possible standards would also best take into account specific duty cycles for different applications or classes of HDV. However, this subject is being investigated in greater detail in a further part of the work. The report also concludes that even under ambitious technology uptake levels starting immediately, GHG emissions from HDVs may only reduce to levels slightly below today's levels by 2030. The report is available from DG-CLIMA at http://ec.europa.eu/clima/studies/transport/vehicles/docs/ec_hdv_ghg_strategy_en.pdf.

Competition to develop Anti-tampering Solutions for L-category Vehicles

The European Commission, assisted by TRL (Transport Research Laboratory, UK), is holding a competition for students and technically-minded members of the public to propose innovative ideas to reduce or prevent the tampering of L-category vehicles. The "L" category includes mopeds, scooters, motorcycles, trikes, quads and mini-cars.

The aim of the competition is to identify effective solutions to prevent tampering so as to protect the environment and the safety of road users. It is open to members of the public, schools, colleges, universities and riders associations across Europe. The deadline for entries is 10 June 2011.

Public Hearing on 'CARS 21' announced

The European Commission's Directorate-General for Enterprise and Industry has announced that there will be a public hearing on 'CARS 21' (Competitive Automotive Regulatory System for the 21st century) in Brussels on 13 May 2011.

The Commission aims to encourage a broader group of stakeholders to contribute discussions and policy recommendations for the CARS 21 Interim Report. During the hearing, the state of play of the key topics will be presented, followed by the presentations from participants and further debate. The main topics that will be discussed are: competitiveness factors of the EU automotive industry, impact of trade policy on the automotive industry, policies for clean road transport and the necessary innovation, fuel and infrastructure policy. Stakeholders can register for the hearing at http://ec.europa.eu/enterprise/sectors/automotive/competitiveness-cars21/cars21/public_hearing_en.htm.

Recession cuts EU Greenhouse Gas Emissions

The recession drove EU CO_2 emissions down by a record 7.2% in 2009, putting the bloc ahead of its climate goals, says a report released on 20 April 2011 by the European Environment Agency (EEA).

Greenhouse gas emissions in Europe fell to the equivalent of 4.6 billion tonnes of CO_2 in 2009 from 4.96 billion in 2008. The fall was almost as much as the annual emissions of either Spain or Poland and was far steeper than any other declines since 1990. Most of 2009's emissions reduction was caused by a steep decrease in carbon emissions from public

electricity and heat production and by reductions in manufacturing activity.

This fifth-successive greenhouse gas fall in a row has put the EU's emissions 17.6% below the 5.59 billion tonnes which were emitted in the UN's base year of 1990. This is close to the EU's 2020 target of a 20% cut below 1990 levels. The report did not, however, signal how far emissions might have rebounded since the return to economic growth in 2010.

European Commission Report on the Quality of Petrol and Diesel

On 11 March 2011, the European Commission issued its 6th and 7th annual reports on the quality of petrol and diesel used for road transport in the EU. The reports summarise Member States' monitoring submissions for 2007 and 2008 respectively.

For petrol the main parameters where exceedances were identified were research/motor octane number (RON/MON), summer vapour pressure and distillation/evaporation at 100/150°C. For diesel the main parameters where exceedances were identified were sulfur content and distillation 95% point. In the 2008 report, the Commission notes an increase in the number of samples exceeding sulfur limits. Nevertheless, the Commission says that as exceedances are relatively rare and most Member States take action to remove non-compliant fuel from sale, the Commission is not aware of any negative repercussions on vehicle emissions or engine functioning due to these exceedances.

European Commission actions on PM_{10} and Industrial Emissions

On 11 March 2011, the European Commission granted the United Kingdom a temporary and conditional exemption in the Greater London Urban Area from the EU's Air Quality standards for airborne particles (PM_{10}). The Commission decision approves the time extension on the condition that the UK adapts its air quality plan for this zone and that short-term measures are introduced to control or, where necessary, suspend activities which contribute to the risk of the limit values being exceeded.

The Commission is, though, taking Belgium to the European Court of Justice (ECJ) for failing to comply with air quality limit values for PM_{10}. The Commission says that Belgium has so far failed to effectively tackle excess emissions of particles in 8 zones across the country since the legislation came into force in 2005. Belgium has applied for time extensions for meeting the targets, but in the Commission's view, the conditions required have not been met.

For Romania, where 17 areas have been found to exceed PM_{10} limits, the Commission is sending a "reasoned opinion" under on-going infringement proceedings. Romania has two months to comply. In the absence of a satisfactory response, the Commission may then refer the case to the ECJ.

The Commission is also taking France to the ECJ for failing to comply with EU rules on industrial emissions. The Commission says that four years after the deadline, France is still failing to ensure that industrial installations meet the requirements of the Directive on Industrial Pollution Prevention and Control (IPPC). According to the latest information available to the Commission, at least 62 industrial installations in France are still operating without a permit.

London Mayor calls for Euro 6 Standard for NO_2

At a meeting with the EU Transport Commissioner and Commission Vice-President Siim Kallas on 14 April 2011, the Mayor of London asked for more help from the Commission in improving air quality.

The Mayor pointed out that an obstacle to improving air quality is the non-performance of the NOx section of Euro emissions standards for new road vehicles. Currently direct NO_2 emissions from a Euro 5 diesel car are five times those of a Euro 2 equivalent, he said, but if standards were made more rigorous they could deliver real air quality benefits. The Mayor asked that Euro 6 standards be kept under review and said that the Commission should consider including an NO_2 standard if necessary as soon as possible.

Czech Republic to allow more Low Emissions Zones

Members of the Czech Republic's Chamber of Deputies have agreed to an amendment to the country's Clean Air Act to allow the creation of more low emissions zones (LEZs). The intent is to combat air pollution from transport, particularly in the industrial region of Moravia. Prague is currently the country's only city with an LEZ.

The proposed change to Czech air quality law, which must now be approved by the senate, will allow local authorities to establish LEZs in their municipalities. Additionally, authorities will be able to allow drivers to bypass cities for free on what normally are tolled roads on days with high smog levels. The revised law is expected to come into force by the end of 2011 after receiving Presidential approval.

The text of the amendment (in Czech) is available at www.psp.cz/sqw/text/tiskt.sqw?o=6&ct=90&ct1=3.

Report on Air Quality in Paris

Airparif, the organisation responsible for monitoring air quality in the Paris region (Ile-de-France), has published a report on the Air Quality in Paris in 2010.

Daily air quality remains unsatisfactory in Ile-de-France for certain pollutants, especially inside the city centre and close to traffic. Depending on the pollutants, 1.8 to 3.6 million inhabitants are potentially exposed to pollution levels above regulated limits. Five pollutants still cause problems in the capital region: NO_2, particles (PM_{10} and $PM_{2.5}$), ozone and benzene (see table). The new EU limit for NO_2 in 2010 set an air quality objective of 40 µg/m³. However it is exceeded both close to the main road axes and further away from traffic, within the Paris city centre. For particles (PM_{10}), levels higher than the allowed limit have been observed since 2003.

	Tendency 2000-2010		Standard (limit value)		Non-binding standards			
					Quality objective		Target value	
	Away from traffic	Close to traffic	Away from traffic	Close to traffic	Away from traffic	Close to traffic	Away from traffic	Close to traffic
PM_{10}	→	→	Respected	Exceeded	Respected	Exceeded		
$PM_{2.5}$	→	→	Respected	Exceeded	Exceeded	Exceeded	Respected	Exceeded
NO_2	↓	→	Exceeded	Exceeded	Exceeded	Exceeded		
O_3	↑				Exceeded		Respected	
Benzene	↓	↓	Respected	Respected	Respected	Exceeded		

The report is available (in French) at http://ftp.airparif.asso.fr/communication/conference-presse/rapport_bilan_2010.pdf.

French Activities on Low Emissions Zones

ADEME, the French environment and energy management agency, has published a comparative study on Low Emissions Zones (LEZs) in Europe.

The report provides an overview of the LEZs that have been implemented in Europe, and studies their impact on air quality, on socio-economic parameters, and on the automobile fleet. ADEME concludes that the implementation of LEZs enhances the development of multi-mode transportation but cannot serve as a single solution to problems of regulated air quality limit values. They have to be part of a larger action plan. Nevertheless, developing LEZs in France could be a useful tool to propose to local authorities in urban areas. The report is available (in French) at: http://www2.ademe.fr/servlet/getBin?name=CD4D0CA11E551C668FEA458B807291EE1302079467963.pdf.

Following this, the French Ministry for ecology, sustainable development, transport and housing launched a public consultation on a draft decree establishing a nomenclature for Low Emissions Zones (ZAPA or Zone d'actions prioritaires pour l'air) in France.

The draft ministerial decree covers powered-two wheelers (PTW), tricycles and quads, passenger cars, light-duty vehicles and heavy-duty trucks and buses. Four vehicle classes of different pollution levels are established, based on the vehicle's first registration date. A colour is attributed to each class - white for the most polluting, then red, yellow and – for the least polluting - green. As an example, the green class includes Euro 4/IV vehicles and Euro 2 and higher PTWs. Local authorities may grant a better class (lower PM and NOx emissions) for certain vehicles, if they are equipped with a certified aftertreatment device (once a certification scheme is in place) and provided it allows meeting of the PM or NOx emissions level for next class.

Particle Pollution down by 50% in Copenhagen

The Danish National Environmental Research Institute's latest statistics show that ultrafine particle pollution in the capital Copenhagen has dropped by around 50% from 2002 to 2010. The measurements carried out by the institute have been made on H.C. Andersens Boulevard that is one of the most heavily trafficked streets in Denmark. The institute attributes the decrease to the renewal of the Danish car fleet, increased use of particulate filters and the introduction of environmental zones.

Scottish Government announces Funding for Bus DPF Retrofits

The Scottish government has announced funding awards of over £500 000 (€572 000) from the Scottish Government's Bus Retrofitting Fund for retrofitting buses in Glasgow and Edinburgh with particulate filters.

Transport Minister Keith Brown has awarded Glasgow City Council £281 000 and City of Edinburgh Council £243 000 to retrofit DPFs to older buses, giving up to an 85% reduction in bus PM emissions. There are over 2 000 buses used daily in Glasgow and Edinburgh. As part of the funding agreement with the Councils, matching funding will be provided.

Buses that are eligible to be fitted with DPFs under this scheme are those in category Euro II or higher which are also fully compliant with the Disability Discrimination Act (DDA) on access for disabled persons. All new buses have had to be DDA compliant since 2000.

Press Report on Effectiveness of the Berlin Low Emissions Zone

'*Berliner Zeitung*' reports that even three years after the introduction of the environmental zone, Berlin is still unable to comply with EU rules on air pollution.

According to the data available so far for 2010 the limit values for particulate matter and NO_2 have still been exceeded. The Directive allows a maximum of 35 days on which the limit values are exceeded. As of December 2010, the PM limits were exceeded, for example, on 48 days in the Neukölln Silbersteinstraße and at the monitoring station on Frankfurter Allee for 53 days. The situation is similar on other busy roads.

There are also violations for NO_2. For this pollutant, there has been an EU limit of 40 µg/m^3 since 1 January 2010. The newspaper says that according to Senate Environmental Management, Hardenbergplatz had levels of 62 µg/m^3, Silbersteinstraße had 55 µg/m^3 and Schildhornstraße in Steglitz reached 54 µg/m^3.

Environment Senator Katrin Lompscher said that only with the introduction of Euro 6 cars will NO_2 emissions be significantly reduced. The city's environmental management insists that the introduction of the Green Zone have been worthwhile in any case. The share of the most dangerous soot particles from diesel exhaust gas at the measurement points has reduced by 30%. This was due to the retrofitting of diesel particulate filters in the car fleet. Of around 230 000 diesel vehicles (trucks and passenger cars) in Berlin approximately 60 000 had been retrofitted. In addition, many older vehicles have been replaced by new diesel vehicles with diesel particulate filters, or by gasoline engines.

Helcom delays NOx Proposal

The nine countries surrounding the Baltic Sea have deferred plans to strengthen NOx controls for shipping until at least the summer.

The Helsinki-based Helcom commission on the protection of the Baltic has been discussing the establishment of a NOx emission control area (NECA) under the UN's Marpol convention for several years. A formal proposal was due to be finalised at its annual meeting, which ended on 9 March 2011. But delegates were unable to agree some details. The next meeting is in June 2011.

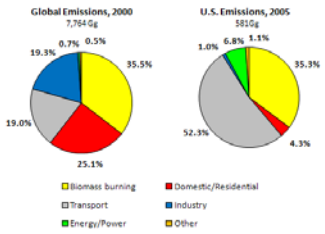
NORTH AMERICA

US-EPA issues Report on Black Carbon

The US Environmental Protection Agency (EPA) has issued a draft of its external peer review report to Congress on Black Carbon (BC).

The report says that mounting scientific evidence suggests that reducing current emissions of BC can provide near-term climate benefits, particularly for sensitive regions such as the Arctic. Because of the strong warming potential and short atmospheric lifetime of BC, BC mitigation offers an opportunity to address key climate effects and slow the rate of climate change. However, BC reductions cannot substitute for reductions in long-lived greenhouse gases (GHGs), which are essential for mitigating climate change in the long run.

The main sources of BC are shown in a chart indicating both the global and US importance of transport as a source of BC. The report says that BC has a short atmospheric residence time of days to weeks. This short lifetime, combined with the strong warming potential of BC, means that the climate benefits of reductions in current emissions of BC will be nearly immediate. The regional climate impacts of BC are highly variable, and the effects of BC on warming and melting are especially strong in sensitive regions such as the Arctic and the Himalayas.



Available control technologies can, the report says, provide cost-effective reductions in BC emissions from many key source categories, resulting in some near-term climate benefits, especially at the regional level. However, available studies also suggest that BC mitigation alone would be insufficient to change the long-term trajectory of global warming (which is driven by GHGs). These cost-effective mitigation strategies will also provide substantial public health co-benefits. Reductions in directly emitted $PM_{2.5}$ can substantially reduce human exposure, providing large public health benefits that often exceed the costs of control, EPA says. In the United States, the average public health benefits associated with reducing directly emitted $PM_{2.5}$ are estimated to range from $270 000 to $1.1 million per ton $PM_{2.5}$ in 2030. The cost of the controls necessary to achieve these reductions is generally far lower. For example, the costs of PM controls for new diesel engines are estimated to be less than $13 000 per ton $PM_{2.5}$. Globally, the health benefits of mitigation strategies aimed at BC would be even larger, potentially averting hundreds of thousands of premature deaths each year. The report highlights that controls on diesel engines and retrofit programmes for in-use mobile sources are already helping to reduce emissions in the US, but the growth of the mobile source sector in developing countries may lead to an increase in their overall BC emissions and a shift in the relative importance of specific BC emitting sources over the next several decades. Further or more rapid reductions in BC will depend on accelerated deployment of clean engines and fuels.

The report does, though, point out that most metrics developed to express the climate impacts of CO_2 and other long-lived GHGs are ill-suited to short-lived climate forcers like BC. There is currently no single metric (for example, the global warming potential, or GWP) that is widely accepted by the science and research community for comparing the array of climate impacts from BC with GHGs. The lack of such a common metric is a clear impediment to direct comparisons among these pollutants. However, new metrics designed specifically for short-lived climate

forcers like BC have recently been developed, and it may be possible to utilise these or other metrics, such as OC/EC (Organic Carbon/Elemental Carbon) ratios, to prioritize among source categories and mitigation options with regard to potential net climate effects.

The report is available from the EPA site at http://yosemite.epa.gov/sab/sabproduct.nsf/MeetingCal/6A702A1E6287B6C78525780E005074BA?OpenDocument.

US-EPA recommendations on Ambient $PM_{2.5}$ Standard

On 19 April 2011 the US Environmental Protection Agency (EPA) released its final policy recommendations for the review of the $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS).

The recommendations suggest that new data most strongly support an annual standard of 11-12 µg/m^3 (currently 15 µg/m^3), rather than the slightly weaker 11-13 µg/m^3 range previously suggested. The report also says, though, that it is appropriate to consider retaining the current 24-hour $PM_{2.5}$ standard of 35 µg/m^3. There is "limited support", it says, to revise the standard downwards. However, earlier draft recommendations to either retain the existing 24-hour PM_{10} standard of 150 µg/m^3 or to tighten it to between 65 and 85 µg/m^3 whilst allowing more exceedances than for the existing standard, are reiterated.

The report is available on the EPA website at www.epa.gov/ttn/naaqs/standards/pm/s_pm_2007_pa.html. A final decision on whether to revise the PM Air Quality Standard is expected in July 2011.

California Grants for Demonstration and Pilot Projects and for Diesel Trucks

During March and April 2011 the California Air Resources Board (CARB) announced the availability of grants for four demonstration and pilot projects: one on ultra-low emitting rail locomotive emissions; one on marine vessel advanced technology demonstrations; one on hybrid off-road equipment; and one on cordless zero-emission commercial lawn and garden equipment.

The $800 000 (approx. €530 000) programme on locomotives will cover between one and four independent demonstration projects on advanced locomotive engines and/or aftertreatment. That on marine vessels will allocate grants totalling some $700 000 (approx. €460 000). Projects to be considered must cost-efficiently reduce the vessel's emissions or usage of its main engine whilst maintaining operational capability. The $2 million pilot project on hybrid off-road equipment will provide funds to accelerate the deployment of commercialised hybrid construction equipment and to validate their emissions benefits. Details of each project are at www.arb.ca.gov/msprog/aqip/solicitations.htm.

California has also announced that $106 million of funding will be available under the Goods Movement Emission Reduction Program to help qualified diesel truck owners to upgrade or replace their vehicles. Projects can include retrofitting or repowering as well as vehicle replacement. Details are at www.arb.ca.gov/bonds/gmbond/gmbond.htm.

Changes to California's Incentives Programme

The California Air Resources Board (CARB) has adopted changes to its Carl Moyer incentives programme for the reduction of pollutants from in-use engines and vehicles.

The revisions include expanding the funding of retrofits for on-road vehicles to the 1994-2006 model years. It was previously limited to trucks made in the 2004-2006 model years. The revisions also include expanding the availability to fleets of up to 10 on-road vehicles, where it was previously limited to 3.

Emergency vehicles as well as lawn and garden equipment replacement have been added as two new source categories for funding and a change in the definition of eligible locomotives extends the opportunities for this category. The programme now requires the highest verified PM retrofit to be included with any off-road re-power. The minimum life for off-road projects is reduced from 3 to 2 years and there is to be a Voucher Incentive Programme as a funding option to replace off-road equipment.

Details are at www.arb.ca.gov/msprog/moyer/moyer.htm.

New Jersey targets Construction Equipment Emissions

The Governor of New Jersey has signed an Executive Order that targets air pollution caused by diesel engines used on major transportation construction projects in New Jersey.

Executive Order No. 60 directs the Department of Environmental Protection (DEP) and Department of Transportation (DOT) to establish a pilot programme that will retrofit 175 pieces of equipment within three years. Upon completion of the pilot project in 2014, the DEP and DOT will conduct a stakeholders' process to gather information to determine if the diesel retrofit project should continue and/or expand. A report and recommendation will be submitted to the Governor, who will make the final decision.

Additionally, under the pilot project to be implemented by the DEP, non-road diesel construction equipment of more than 100 horsepower (such as bulldozers, graders and pavers) used in State-financed

construction projects must meet stringent standards or must be retrofitted with devices to achieve at least an 85% reduction in particulate matter emissions. Retrofits will be financed by $2.5 million in DEP grants from State and Federal air quality mitigation funds.

British Columbia extends Retrofit Exemption to September 2011

The Ministry of Transportation and Infrastructure for British Columbia, Canada, has said that it will extend the exemption for owners of older trucks to meet the province's diesel retrofit requirement for a further six months, until 30 September 2011, because some emissions control components are not yet available.

Under the diesel retrofit requirement, 1989–1993 model year heavy-duty diesel vehicles (GVW >8200 kg) registered in the province must be retrofitted with a verified DOC or equivalent. The requirement is part of the province's Air Action Plan and affects some 4200 vehicles.

The regulation has already been suspended for 6 months from its original start date of 1 October 2010 because many of the required components were reportedly not yet available for delivery. Details are at www.cvse.ca/diesel_retrofit/faq.htm.

Vancouver adopts Non-Road Diesel Engine Emissions Regulation

Metro Vancouver has adopted a new bylaw on the emissions of non-road diesel engines.

Metro Vancouver says that non-road diesel machines are one of the primary contributors to emissions of diesel particulate matter in the region and are often emitted close to where people live, work and play – resulting in higher exposures and increased health risks.

The 'Greater Vancouver Regional District Non-Road Diesel Engine Emission Regulation Bylaw No. 1137, 2011' promotes the reduction of diesel emissions from industrial and construction machines such as excavators, backhoes, forklifts, loaders, switch locomotives and stationary equipment. The regulation applies to all private and public sector non-road diesel machines of 25 hp (37 kW) or greater operating in Metro Vancouver.

Beginning in 2012, in addition to the general operating requirements limiting the opacity of emissions and the amount of idling, an owner or operator of a 'Tier 0' non-road diesel engine must register, label and pay a fee prior to operation of the engine. This will be extended to 'Tier 1' engines beginning in 2014. Owners or operators may reduce or eliminate fees by reducing their emissions. If emissions are substantially reduced by retrofitting, rebuilding, replacing or retiring an engine such that 'Tier 2' emissions standards are achieved then an owner or operator would be eligible for a refund of 80% of fees paid over the previous three years. Details are at www.metrovancouver.org/services/permits/DieselEmissions/Pages/default.aspx.

US-EPA funds Four New Clean Air Research Centres

The US Environmental Protection Agency has awarded $32 million (approx. €22 million) to fund four new Clean Air Research Centres.

Each centre will receive approximately $8 million over five years. They are located at Harvard University in Boston, Massachusetts; Michigan State University; the University of Washington in Seattle, Washington State; and Emory University and Georgia Institute of Technology in Atlanta, Georgia.

The research will focus on the impacts of air pollution mixtures on people's health. The research centres will explore the health impacts on children and older citizens to determine which health effects occur at different life stages. They will also study those most susceptible to air pollution, including people with pre-existing conditions and people living in communities where there are greater health risks associated with air pollution. More details are at www.epa.gov/ncer/clarcs.

2011 Report on US 'State of the Air'

The American Lung Association (ALA) has released its annual State of the Air report for 2011. The report examines the levels of ozone and particle pollution found at monitoring sites across the United States in 2007, 2008, and 2009.

The report shows that air quality in many places has improved during the period reported, but over 154 million people, just over half the nation, suffer potentially dangerous pollution levels. About 48% of US residents live in counties where ozone is too high, 20% live in areas where there are too many short-term spikes in ozone, and 6% live in areas with harmful year-round particulate levels. Californian cities topped the list of US cities with the worst air pollution.

US-EPA issues Proposed Rules on Emissions from Power Plants & Boilers

On 16 March 2011 the US Environmental Protection Agency (EPA) issued proposals to revise the New Source Performance Standards for PM, SO_2 and NOx emissions for all fossil fuel-powered boilers that produce steam to produce electricity or provide heat, including those at commercial and industrial facilities. EPA also proposes to limit Air Toxics emissions standards for new and existing coal- and oil-fired power plants. EPA estimates that approximately 1200

existing coal-fired units and 150 oil fired units at about 525 power plants will be affected by the proposals.

A final rule is expected to be published in November 2011. Once the rules are final, companies will have 3 years to comply, although they will be able to get a one-year extension if it proves impossible to get the controls added in time. Details of the proposal are at www.epa.gov/airquality/powerplanttoxics/pdfs/proposal.pdf.

US-EPA Final Rule on Alternative Fuel Conversion Systems

The US Environmental Protection Agency (EPA) has announced its final rulemaking to amend the regulations applicable to manufacturers of alternative fuel conversion systems. EPA says the changes clarify and streamline processes while maintaining strong environmental safeguards.

EPA has established protocols through which conversion manufacturers may seek exemption from the tampering prohibition by demonstrating that emissions controls in the converted vehicle or engine will continue to function properly and that pollution will not increase as a result of conversion.

Petition asks US-EPA to Mandate Retention of 10% Ethanol Fuel

A consortium of automotive, marine, motorcycle, outdoor power equipment, personal watercraft, and snowmobile groups has filed a petition asking the US Environmental Protection Agency (EPA) to ensure the continued sale and availability of gasoline blends of no greater than 10% ethanol (E10).

Since EPA authorised the use of E15 (gasoline containing up to 15% ethanol) for many existing cars, the groups are concerned that retailers may opt to supply only E15. They say that millions of engine products in the US were not designed, built, or warranted to run on any fuel containing more than 10% ethanol. Unless EPA mandates the continued availability of E10, groups are concerned that the fuel will become unavailable.

SOUTH AMERICA

Changes to Brazilian Ethanol Mandate

An executive measure published at the end of April 2011 in Brazil's Official Gazette allows the government to lower the required ethanol blend in petrol to 18%. Previously the minimum was 20% and the maximum 25%. The measure goes into effect immediately.

ASIA PACIFIC

ICCT Report on China's Vehicle Emissions Control Programme

The International Council on Clean Transportation (ICCT) has released a report that, completed at the request of China's Ministry of Environmental Protection (MEP), provides an assessment of China's vehicle emissions control programme.

The report details the accomplishments to date and deficiencies of China's efforts to reduce pollution from mobile sources. It assesses the impacts of additional tightening of vehicle and fuel standards in China, improvements in fuel consumption standards, and improvements to China's emissions compliance programme. Several options for both emissions standards and fuel were considered.

The report makes a number of recommendations, including continued progress towards more stringent motor vehicle standards and amending China's current clean air laws to enhance MEP's authority to set fuel standards, enforce vehicle/fuel standards, conduct recall campaigns, and penalise non-compliance.

The report is available at www.theicct.org/2011/04/overview-vehicle-emissions-controls-china.

Beijing plans to Remove 400 000 High-Polluting Cars

During a press conference to introduce the new Beijing Clean Air Plan, Zang Yuanwei, deputy director of the Environmental Protection Bureau's vehicle emissions management division said that more than 400 000 high-polluting cars will be removed from Beijing's roads within the next five years, 50 000 of them by the end of 2011.

The clean air plan sets a target of 292 "blue-sky days" by 2015, up from 286 days last year. Dongcheng and Xicheng districts will also be made dust pollution sample zones, while Beijing will work with neighbours Tianjin municipality and Hebei province to establish an air pollution prevention system. "Yellow label" cars - those that do not meet the Euro I engine standard - are already banned inside the Sixth Ring Road, but will be further restricted. Long-term regulations will be released in the coming months to ensure stricter monitoring and supervision, such as increasing the required frequency for car safety checks.

Report on Air Pollutants in China's Pearl River Delta

On 28 April 2011, the Environmental Protection Department (EPD) of the Government of the Hong Kong (China) Special Administrative Region (HKSAR) and the Department of Environmental Protection of

Guangdong Province (GDEPD) released a report on the monitoring results of four major air pollutants (SO_2, NO_2, ozone, and respirable suspended particulates) measured by the Pearl River Delta Regional Air Quality Monitoring Network in 2010.

The average annual concentrations of SO_2, NO_2 and respirable suspended particulates in the region have decreased by 47%, 7% and 14% respectively in 2010 as compared to the 2006 levels, when monitoring began. The average annual concentration level of NO_2 for 2010 remained more or less the same as the 2009 level, but the average annual concentration levels of SO_2, respirable suspended particulates and ozone decreased by 14%, 7% and 5% respectively.

The departments say that these reductions are attributable to implementation of enhanced emissions reduction measures, including the tightening of motor vehicle fuel specifications and Hong Kong's provision of financial subsidies to encourage early replacement of Euro II diesel commercial vehicles.

The report is available on both departments' websites (www.gdepb.gov.cn and www.epd.gov.hk).

Hong Kong, China to fund Testing of 'Green' Vehicles, Technology

The Environmental Protection Department of the Hong Kong Special Administrative Region has announced that, as part of a 300 million HKD (€25.5 million) Pilot Green Transport Fund, companies in the transportation sector can apply for funding to test new vehicles and technology that will reduce greenhouse gas and air pollutant emissions.

Test products may include alternative-energy vehicles like hybrids or emissions reduction devices, such as diesel particulate filters, catalytic reduction devices, and exhaust gas recirculation systems. The funding will subsidise the costs of retrofitting vehicles or installing technology "not already in common use" locally, the department said. For vehicles, the subsidy will cover the difference between the cost of an alternative-energy vehicle and of one that uses conventional fuels, or 50% of the total cost, whichever is higher. To be eligible for funding, technology must meet a number of criteria, including that it "outperforms its conventional counterpart by emitting significantly less air pollutant or greenhouse gas, or demonstrating much better fuel economy," according to the Green Transport Fund website.

Indian State of Delhi raises Taxes on Diesel Vehicles to reduce Air Pollution

The Indian state of Delhi, which includes the national capital of New Delhi, has adopted a budget that increases all taxes (road tax, value-added tax, etc.) on diesel vehicles by 25% in order to limit air pollution. The additional tax will be applied upon registration of the vehicle in Delhi.

In addition, nearly 25% of the Delhi budget will be allocated to public transportation. This includes money for the third phase of the Delhi Metro and for 14 new rapid-transit bus corridors (the National Capital Region of Delhi has the world's largest fleet of public transport vehicles running on CNG).

Japan's Air Quality improved in 2009

The Japanese Ministry of Environment has reported that in fiscal year 2009, some 95.7% of the country's 423 emission monitoring points registered nitrogen oxides levels below maximum tolerance levels, up slightly from 95.5% of stations in fiscal year 2008. For suspended particulate matter, 99.5% of the monitoring sites were within tolerance levels, up from 99.3%. Sulfur oxides levels were within tolerance levels at all points, while carbon monoxide levels were unchanged at 0.5 ppm per hour. Levels of photochemical oxidants also remained unchanged at 0.048 ppm per hour.

While most pollutant levels decreased across the nation as a whole, Japan's urban areas still lagged in performance, particularly regarding levels of nitrogen oxides, an official of the ministry's Water and Air Environment Bureau said. For example, 92.9% of urban monitoring points recorded nitrogen oxides within tolerance levels, lower than the national average but up from 92% in 2008.

Kazakhstan plans to go Straight to Euro 5 Gasoline Standards

Kazakhstan will upgrade directly to Euro 5 standard gasoline production as soon as modernisation works at its three oil refineries are completed, Kazakh Foreign Minister Sauat Mynbayev said on 30 March 2011. "The requirements for gasoline production standards are rapidly increasing. Theretofore, if we move in stages, first to Euro 3, and then to Euro 4, it will take more time and most importantly more money," the *Trend* news agency reported Mynbayev telling journalists in the capital Astana. No date was given for the completion of the refineries, though.

AFRICA

South Africa releases Draft Fuel Specifications

South Africa's Energy Minister, Dipuo Peters, has released new draft fuel specifications and has given the country's oil industry a deadline of 2017 for them to upgrade their refineries. The new specifications reduce the permitted level of sulfur from 500 ppm to 10 ppm and levels of benzene from 5% to 1%. Aromatics in petrol would reduce from 50% to 35%.

Mauritius to move to 50 ppm S Diesel

Mauritius has announced plans to move to 50 ppm sulfur diesel in 2011. The announcement was made by the Minister for Environment and Sustainable Development, Hon. Devanand. Mauritius switched to 500 ppm sulfur diesel in August 2010.

MIDDLE EAST

Tehran Refinery to produce Euro 5 Fuel by October 2011

The Managing Director of the Tehran Oil Refinery (Tondguyan Refinery) has told the official website of Iran's Oil Ministry, SHANA, that the refinery will start producing gasoline compliant with the Euro 5 standard by October 2011.

UNITED NATIONS

UNECE to Include Black Carbon in the Gothenburg Protocol

On 15 April 2011 the UNECE announced that the reduction of Black Carbon is being targeted through a revision of the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP).

The Convention's Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (the Gothenburg Protocol), will now include Black Carbon as a component of fine particulate matter. Black Carbon, like ozone, is a so-called "short-lived climate forcer" i.e., a warming agent with a relatively short lifetime in the atmosphere ranging between days and weeks. Reducing levels of such agents in the atmosphere is therefore a means to improve air quality, and thus human health, but also to immediately act on slowing down climate change.

According to the findings of the Ad Hoc Expert Group on Black Carbon discussed by ECE policymakers, Black Carbon emissions in the UNECE region are expected to decline between 2000 and 2020 by about one third, primarily as a result of on-going implementation of current emissions control legislation in the transport sector. However, additional measures could reduce them by another 40% by 2020. The most important sectors with Black Carbon mitigation potential are seen as residential combustion and off-road machinery, such as diesel propelled heavy vehicles used in industry, construction, agriculture and forestry. ECE says these "have a long lifetime and often are poorly maintained, offer the second largest reduction potential for black carbon emissions in the UNECE region - about 20%. This can be achieved mainly through eliminating high-emitting vehicles and enforcing the Euro VI standards and accelerated introduction of diesel particle filters."

The group also says that the road transport sector can deliver additional reductions through the elimination of high-emitting vehicles (super emitters) and accelerated introduction of DPFs for light-duty and heavy-duty vehicles, as well as retrofitting of existing vehicles. Overall, in 2020 these measures would account for less than 10% of the total mitigation potential in the UNECE region.

UN Assessment Tool for Transport CO_2 Emissions

The United Nations Development Account (UNDA) has launched a new project on the development and implementation of a monitoring and assessment tool for CO_2 emissions in inland transport, with the objective of facilitating climate change mitigation. The project aims at enhancing international cooperation and planning towards sustainable transport policies, through the development and use of a standard monitoring and assessment tool for CO_2 emissions in inland transport including a transport policy converter. Details are at www.unece.org/trans/theme_ForFITS.html.

UNEP Report on Green Economy

A new United Nations Environment Programme (UNEP) report *"Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*" looks at pathways to sustainable development and includes a chapter on Transport.

The Transport chapter says that "business-as-usual" will significantly enlarge vehicle fleets and exacerbate their costs to society. A three-pronged investment strategy is needed to transform this sector: promote access instead of mobility; shift to less harmful modes of transportation; and improve vehicles towards lower carbon intensity and pollution. Several scenarios show that a green, low carbon, transport sector can reduce greenhouse gas emissions by 7% without major additional investment.

The report is available from the UNEP website at http://www.unep.org/greeneconomy/v2/GreenEconomyReport/tabid/29846/Default.aspx.

RESEARCH SUMMARY

Effects of Emissions

Effect of Traffic-related Pollution on Birth Outcomes

The objectives of this study were to compare effect estimates for traffic-related air pollution exposure and preeclampsia, preterm birth (gestational age less than 37 weeks), and very preterm birth (gestational age less than 30 weeks) based on four commonly used exposure assessment methods.

The authors say they generally confirmed that traffic-related air pollution was associated with adverse reproductive outcomes regardless of the exposure

assessment method employed, yet the size of the estimated effect depended on how both temporal and spatial variations were incorporated into exposure assessment. Local traffic may contribute somewhat more to preeclampsia than regional source but regional source may contribute somewhat more to preterm birth than local source.

Source: Wu, Wilhelm, Chung and Ritz, Comparing exposure assessment methods for traffic-related air pollution in an adverse pregnancy outcome study; *Environmental Research* (2011), doi:10.1016/j.envres.2011.03.008.

Traffic-related Pollution and Birth Weight

An association between exposure to traffic-related air pollution and reduced birth weight has been suggested. However, the authors of this paper say that previous studies have failed to adjust for maternal size, which is an indicator of individual genetic growth potential. Therefore, they evaluated the association of air pollution with birth weight, term low birth weight, and 'small for gestational age', with adjustment for maternal size. Despite limitations, they did not find clear associations between birth-weight-related outcomes and markers of traffic-related pollution.

Source: Kashima, Naruse, Yorifuji, Ohki, Murakoshi, Takao, Tsuda and Doi, Residential proximity to heavy traffic and birth weight in Shizuoka, Japan; *Environmental Research* (2011), doi:10.1016/j.envres.2011.02.005.

Thrombotic Events and Diesel Particulate

This study was undertaken to determine the cardiovascular effect of intratracheally instilled diesel exhaust particulate on mice that had been made hypertensive. The authors conclude that the thrombotic events caused by Diesel Exhaust Particulate are exacerbated by hypertension in mice. Their findings, therefore, provide a possible plausible explanation for the cardiovascular morbidity and mortality accompanying urban air pollution.

Source: Nemmar, Zia, Subramaniyan, Fahim and Ali, Exacerbation of thrombotic events by diesel exhaust particle in mouse model of hypertension; *Toxicology* (2011), doi:10.1016/j.tox.2011.03.018.

Genotoxicity and Oxidative Stress of $PM_{2.5}$

In this study, the genotoxicity of $PM_{2.5}$ collected from the traffic area in Suwon City, Korea, was studied using cultured human lung bronchial epithelial cells as a model system for potential inhalation health effects. The authors say that the results clearly suggest that the $PM_{2.5}$ has genotoxic effects and that reactive oxygen species may play a distinct role in them.

Source: Seung Min Oh et al., Organic extracts of urban air pollution particulate matter ($PM_{2.5}$)-induced genotoxicity and oxidative stress in human lung bronchial epithelial cells (BEAS-2B cells); *Mutation Research/Genetic Toxicology and Environmental Mutagenesis* (2011), doi:10.1016/j.mrgentox.2011.04.003.

Estimation of Age-related Vulnerability to Air Pollution

This paper demonstrates the association of short-term variation in pollution and health outcomes within the same geographical area for a typical urban setting in the northern part of the UK from time series analysis. The authors say their results show that PM_{10} and O_3 are positively associated with respiratory hospital admissions in the elderly, specifically in the age group 70–79. CO effects seem to be concentrated on the most elderly age group (80+) whereas NO_2 seems to have lower effects on the more elderly.

Source: Namdeo, Tiwary, and Farrow, Estimation of age-related vulnerability to air pollution: Assessment of respiratory health at local scale; *Environment International* (2011), doi:10.1016/j.envint.2011.02.002.

Effect of Vehicle Exhaust on Plants

This paper describes an investigation into the direct impacts of vehicle exhausts on plants, using 12 herbaceous species typical of urban areas and representing different functional groups. A wide range of effects were detected, including growth stimulation and inhibition, changes in gas exchange and premature leaf senescence. All evidence suggested that NOx was the key phytotoxic component of exhaust emissions, and the authors say this highlights the potential for detrimental effects of vehicle emissions on urban ecosystems.

Source: Bell, Honour and Power, Effects of vehicle exhaust emissions on urban wild plant species; *Environmental Pollution* (2011), doi:10.1016/j.envpol.2011.03.006.

Assessment of Exposure

Ultrafine Particle Exposure during Transit

The authors of this review identified 47 exposure studies performed across 6 transport modes: automobile, bicycle, bus, ferry, rail and walking. After weighting mean UFP concentrations by the number of trips in which they were collected, they found overall mean UFP concentrations of 3.4, 4.2, 4.5, 4.7, 4.9 and 5.7×10^4 particles/cc for the bicycle, bus, automobile, rail, walking and ferry modes, respectively. The mean concentration inside automobiles travelling through tunnels was 3.0×10^5 particles/cc.

The authors say that while the mean concentrations were indicative of general trends, they found that the determinants of exposure (meteorology, route, fuel type, exhaust treatment technologies etc.) exhibited marked variability and mode-dependence, such that it is not necessarily appropriate to rank modes in order of exposure without considering these factors.

Source: Knibbs, Cole-Hunter and Morawska, A review of commuter exposure to ultrafine particles and its health effects; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.02.065.

Impact of Local Traffic Exclusion on Air Quality

In this paper kerbside airborne particulate matter (PM) concentrations and its pro-inflammatory capacity were monitored during 3 weekends when vehicle traffic was excluded from Park Ave., New York City. The coarse fraction (>2.5 μm) had the greatest intrinsic

inflammatory capacity, suggesting that coarse PM still warrants attention even as the research focus is shifting to nano-particles, the authors say.

Source: Whitlow, Hall, Zhang and Anguita, Impact of local traffic exclusion on near-road air quality: Findings from the New York City "Summer Streets" campaign; *Environmental Pollution* (2011), doi:10.1016/j.envpol.2011.02.033 or www.ncbi.nlm.nih.gov/pubmed/21429643.

Air Quality

Increased Life and Wealth from Cleaner Air

EU-supported research findings by the Aphekom project show that significant health and monetary benefits could result from further reducing current levels of air pollution in European cities.

The findings, released at a stakeholders meeting on 2 March 2011 shows that compliance with WHO's annual air-quality guideline on $PM_{2.5}$ fine particles (10 µg/m^3) in 25 large European cities could both add up to 22 months of life expectancy for persons 30 years of age and older, and produce 31.5 billion euros in monetary health benefits every year.

Source: Summary report of the Aphekom project (Improving Knowledge and Communication for Decision Making on Air Pollution and Health in Europe), 2008-2011; www.aphekom.org/c/document_library/get_file?uuid=5532fafa-921f-4ab1-9ed9-c0148f7da36a&groupId=10347.

Local and Long-range Contributions to Particulate

The authors of this study used Particulate Matter Source Apportionment Technology (PSAT) in a regional chemical transport model to quantify the contributions from local emissions and short range (under 100 km), mid-range (100 – 550 km) and long range (over 550 km) pollutant transport to both primary and secondary particulate matter concentrations using the Eastern US as a test case.

The local emissions impacts to elemental carbon (EC) in major urban areas were found to be substantial with approximately 50% of the EC coming from local sources and 80% emitted within 200 km. EC in the rural area was mainly the result of sources 100-550 km away. Contributions to secondary aerosol species were found to be more regional.

Source: Wagstrom and Pandis, Contribution of Long Range Transport to Local Fine Particulate Matter Concerns; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.02.040.

$PM_{2.5}$ Measurements in Nairobi, Kenya

A study of traffic-related $PM_{2.5}$ was carried out in the city of Nairobi, Kenya, a model city for sub-Saharan Africa, in July 2009. Sampling was carried out using portable filter-based air samplers carried in backpacks by technicians on weekdays over two weeks at several sites in and around Nairobi ranging from high-traffic roadways to rural background.

The authors say that taken together with survey data on commuting patterns within Nairobi, the results suggest that many Nairobi residents are exposed on a regular basis to elevated concentrations of fine particle air pollution.

Source: Kinney et al, Traffic impacts on $PM_{2.5}$ air quality in Nairobi, Kenya; *Environmental Science & Policy* (2011), www.vref.se/download/18.53e8780912f2dbbe3a580002301/Traffic+Impacts+on+PM.pdf (doi:10.1016/j.envsci.2011.02.005).

Study on Black Carbon outside Schools

A study was performed to assess the relationship between black carbon (BC), passing traffic, and vehicular idling outside New York City schools during student dismissal. Model results suggested that variability in ambient $PM_{2.5}$ concentration contributed 24% of the variability in transformed BC concentration, while variability in the number of idling buses and trucks on the street during dismissal contributed 20% of the variability.

Source: Richmond-Bryant, Bukiewicz, Kalin, Galarraga and Mirer, A multi-site analysis of the association between black carbon concentrations and vehicular idling, traffic, background pollution, and meteorology during school dismissals; *Science of The Total Environment* (2011), doi:10.1016/j.scitotenv.2011.02.024.

Primary NO_2 Emissions / Atmospheric Concentrations

In an assessment of the formation of NO_2 in heavily traffic-influenced environments in Helsinki, a quantitative estimate was derived for the relative importance of the primary NO_2 emissions, ambient NO-NO_2-O_3 equilibrium and background concentrations in the observed NO_2 concentrations.

The contribution of chemical conversion steadily decreased from 54% in 2005 to 43% in 2009, while that of the primary NO_2 emissions increased from 32 to 44%. The authors say that in order not to exceed in future the annual limit of NO_2 concentration, set by the European Union, in the busiest street canyons in downtown Helsinki, the primary NO_2 emissions need to be addressed alongside the total NOx emissions.

Source: Anttila, Tuovinen and Niemi, Primary NO_2 emissions and their role in the development of NO_2 concentrations in a traffic environment; *Atmospheric Environment* (2011) 45 (4) pp. 986-992, doi:10.1016/j.atmosenv.2010.10.050.

CO_2 and Pollutant Emissions in China

In this paper, CO_2 and pollutant emissions of passenger cars (PC) in China from 2000 to 2005 were calculated based on a literature review and measured data. The future trends of PC emissions were also projected under three scenarios to explore the reduction potential of possible policy measures. Significant variations were found in PC emissions inventories between different studies primarily due to uncertainties in activity levels and/or emission factors.

Source: Wang, Fu and Bi, CO_2 and pollutant emissions from passenger cars in China; *Energy Policy* (2011), doi:10.1016/j.enpol.2011.03.013.

'Neural' Networks for Prediction of Urban Air Quality

A recent study assesses new methods for comparing and predicting air quality data in Helsinki (Finland) and Thessaloniki (Greece) that significantly improve the capability to analyse and predict air quality in these cities. There are good indications that the methods could be applied to other European cities.

Source: Voukantis et al., Intercomparison of air quality data using principal component analysis and forecasting of PM_{10} and $PM_{2.5}$ concentrations using artificial neural networks, in Thessaloniki and Helsinki; *Science of the Total Environment* (2011) 409 (7) pp.1266-1276, doi: 10.1016/j.scitotenv.2010.12.039.

High Emitters in Vehicle Emissions Models

A new method is presented which is designed to investigate whether laboratory test data used in the development of vehicle emissions models adequately reflects emissions distributions, and in particular the influence of high-emitting vehicles. The method includes the computation of a 'high-emitter' or 'emission distribution' correction. The analysis suggests that high-emitting vehicles may not be adequately captured in the laboratory test data.

Source: Smit and Bluett, A new method to compare vehicle emissions measured by remote sensing and laboratory testing: High-emitters and potential implications for emission inventories; *Science of the Total Environment,* doi:10.1016/j.scitotenv.2011.03.026.

Engine Development and Emissions Measurement

Roadside Remote Sensing of Vehicle Emissions

The emissions of over 50 000 vehicles in London were measured using roadside remote sensing techniques, combined with Automatic Number Plate Recognition for vehicle identification. CO, HC, NO and smoke (particulate) emissions are reported by vehicle class, fuel type, and Euro emissions standard.

Emissions from petrol cars of each pollutant were all observed to display a statistically significant reduction with the introduction of each successive Euro emissions standard. However, Euro 2 diesel cars were observed to emit statistically higher rates of NO than either Euro 1 or Euro 3 cars. Mean NO emissions from Euro 4 diesel cars were found to be 6 times higher than Euro 4 petrol cars, highlighting the need to develop a sound understanding of the current and future 'in-use' emissions characteristics of diesel vehicles, and their influence on local air quality.

Source: Rhys-Tyler, Legassick and Bell, The significance of vehicle emissions standards for levels of exhaust pollution from light vehicles in an urban area; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.03.035.

Effect of Advanced Aftertreatment on Ultrafines

Four heavy-duty and medium-duty diesel vehicles were tested in six different aftertreament configurations using a chassis dynamometer to characterize the occurrence of nucleation (the conversion of exhaust gases to particles upon dilution). The aftertreatment included four different diesel particulate filters and two selective catalytic reduction (SCR) devices.

All DPFs reduced the emissions of solid particles by several orders of magnitude, but in certain cases the occurrence of a volatile nucleation mode could increase total particle number emissions. The particles measured during nucleation had a high fraction of sulfate, up to 62% of reconstructed mass. Additionally the catalyst reduced the toxicity measured in chemical and cellular assessments.

Source: Herner et al, Effect of Advanced Aftertreatment for PM and NOx Reduction on Heavy-Duty Diesel Engine Ultrafine Particle Emissions; *Environmental Science & Technology* (2011) 45 (6) pp.2413–2419, doi: 10.1021/es102792y.

Effects of Excess Manganese on Oxidation Activity

The effects of excess manganese on enhancement of the oxidation activity of $LaMn_{1+x}O_{3+\delta}$ perovskite for CO and propane removal from a synthetic automotive exhaust gas are reported in this paper.

Source: Esmaeilnejad-Ahranjani, Khodadadi, Ziaei-Azad and Mortazavi, Effects of excess manganese in lanthanum manganite perovskite on lowering oxidation light-off temperature for automotive exhaust gas pollutants; *Chemical Engineering Journal* (2011), doi:10.1016/j.cej.2011.02.062.

Reactive Nitrogen Species

This paper examines the effects of a urea-SCR system on reactive nitrogen compounds. The authors say that on roads, SCR systems will partly be inactive when exhaust temperatures drop below 220°C. The system was active only during 75% of the test cycle, and urea dosing was stopped and restarted several times. Consequently, NO conversion stopped but interestingly, NO_2 was still converted. The investigated SCR technology substantially lowered NO and NO_2 emissions, while NH_3 levels were comparable to those of three-way catalyst vehicles.

Source: Heeb, Zimmerli, Czerwinski, Schmid, Zennegg, Haag, Seiler, Wichser, Ulrich, Honegger, Zeyer, Emmenegger, Mosimann, Kasper and Mayer, Reactive Nitrogen Compounds (RNCs) in exhaust of advanced PM-NOx abatement technologies for future diesel applications; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.02.013.

Effect of SCR on PCCD and PCDF Emissions

This paper concerns an investigation of the impact of copper zeolite SCR catalysts and exhaust aftertreatment configurations on the emissions of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) from mobile source diesel engines. In addition, different chlorine concentrations were evaluated.

Results showed that all aftertreatment configurations reduced PCDD and PCDF emissions in comparison to the engine-out reference. Experiments performed with

high chlorine concentration provided no evidence that chlorine content has an impact on the catalytic synthesis of PCDD & PCDFs.

Source: Liu, Wall, Barge, Dettmann and Ottinger, Investigation of PCDD/F Emissions from Mobile Source Diesel Engines: Impact of Copper Zeolite SCR Catalysts and Exhaust Aftertreatment Configurations; *Environmental Science Technology* (2011) 45 (7) pp.2965-72, www.ncbi.nlm.nih.gov/pubmed/21446770.

Effects of Biodiesel and Ethanol-Biodiesel Blends

In this study, Euro V diesel fuel, biodiesel, and ethanol–biodiesel blends (BE) were tested in a 4-cylinder direct-injection diesel engine to investigate the combustion, performance and emissions characteristics of the engine under five engine loads at the maximum torque engine speed of 1800 rpm.

On the whole, compared with Euro V diesel fuel, the BE blends could, the authors say, lead to reduction of both NOx and particulate emissions of the diesel engine. The effectiveness of NOx and particulate reductions increases with increasing ethanol in the blends. With high percentage of ethanol in the BE blends, the HC, CO emissions could increase.

Source: Lei Zhu et al, Combustion, performance and emission characteristics of a DI diesel engine fueled with ethanol–biodiesel blends; *Fuel* (2011) 90 (5) pp.1743-1750, doi:10.1016/j.fuel.2011.01.024.

Emissions from Diesel Blended with Diethyl Adipate

Experiments were carried out on a four-cylinder direct-injection diesel engine operating on Euro V diesel fuel blended with diethyl adipate (DEA). The blended fuels contain 8.1%, 16.4%, 25% and 33.8% by volume fraction of DEA, corresponding to 3%, 6%, 9% and 12% by mass of oxygen in the blends.

In comparison with diesel fuel, the blended fuels resulted in an increase in HC and CO, but a decrease in particulate mass concentrations. The NOx emission experienced a slight variation among the test fuels. In regard to the non-regulated gaseous emissions, formaldehyde and acetaldehyde increased, while 1,3-butadiene, ethene, ethyne, propylene and BTX (benzene, toluene and xylene) in general decreased. A diesel oxidation catalyst (DOC) was found to reduce significantly most of the investigated non-regulated pollutants when the exhaust gas temperature was sufficiently high.

Source: Zhu, Cheungb, Huang and Wang, Regulated and unregulated emissions from a diesel engine fueled with diesel fuel blended with diethyl adipate; Atmospheric Environment (2011) 45 (13) pp.2174-2181, doi:10.1016/j.atmosenv.2011.01.062.

Characterisation of Particulate

Particle Emissions from Wood Combustion

Particle samples were collected from six small-scale wood combustion appliances representing different combustion situations. The authors say that the results highlight that same PM_1 emissions can be associated with very different chemical compositions, potentially leading to different toxic properties of the particles. Thus, changing from an old, less efficient, combustion appliance to a modern appliance can have a greater impact on toxic properties than the emitted PM_1 mass might indicate.

Source: Lamberg et al, Physicochemical Characterization of Fine Particles from Small-Scale Wood Combustion; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.02.072.

Climate Change and Emissions

Air Pollution and Climate Change Co-benefits

In the city of Durban, South Africa, the growing dependence on privately-owned motor vehicles and increasing usage of roads for freight transport have all resulted in significant air pollution and greenhouse gas emissions. In this study, an emissions inventory was developed for the road transport sector and was used as a basis to explore intervention opportunities that are likely to reduce simultaneously, air pollution and greenhouse gas emissions in this sector. It was found that reducing the vehicle kilometres travelled by privately-owned motor vehicles and improving the efficiency of road freight transport offered the greatest potential for achieving co-benefits.

Source: Thambiran and Diab, Air Pollution and Climate Change Co-benefit Opportunities in the Road Transportation Sector in Durban, South Africa; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.02.059.

Black Carbon as an Indicator of Air Quality Benefits

This study reports the results of a black carbon monitoring campaign carried out in Milan, Italy, with the aim to detect - and demonstrate more suitably than PM mass - differences in local urban air quality among three zones located very closely but with different traffic intensity.

The results demonstrated a sharply declining gradient in black carbon (BC) levels from the outer zone, without traffic restrictions, to the more central areas, for all of three radial main roads. The differences in mean black carbon levels in the same day in the different traffic scheme locations were highly significant for each comparison. In contrast to the BC results, mean PM_{10}, $PM_{2.5}$, and PM_1 concentrations did not show significant differences among the different traffic zones on the different campaign days.

Source: Invernizzi et al, Measurement of Black Carbon Concentration as an Indicator of Air Quality Benefits of Traffic Restriction Policies within the Ecopass zone in Milan, Italy; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.04.008.

Relationship between Black Smoke and Black Carbon

This paper presents further parallel data sets to support the general validity of the relationship described in a previous paper. In 2007, a simple quadratic relationship between OECD Black Smoke

Index and Black Carbon (aethalometry) measurements of ambient particulate samples based on their common link to optical absorption coefficient was indeed supported by a single data set.

These new data sets also highlight limitations to the traditional Black Smoke method at kerbside sites, and variations between sites. Finally, the opportunity is taken to clarify some confusing aspects concerning published standard methods for Black Smoke.

Source: Quincey, Butterfield, Green and Fuller, Black Smoke and Black Carbon: further investigation of the relationship between these ambient air metrics; *Atmospheric Environment* (2011), doi:10.1016/j.atmosenv.2011.04.009.

FORTHCOMING CONFERENCES

Engine Expo 2011

17-19 May 2011, Stuttgart, Germany

Details at www.engine-expo.com

Sessions include future engine and transmission developments and emissions standards.

Vehicle Emissions Reduction Conference – Criteria Pollutants and CO_2

17-20 May 2011, Detroit, Michigan, USA

Details at www.emission-control-systems.com/index.asp?page=veranstaltung&lang=deutsch&sid

One day of the conference will be dedicated to provide an update on cutting edge technologies. A second day will be dedicated to evolving technologies on heavy-duty diesel PM and NOx control. A third day will be devoted to technologies to reduce CO_2.

2011 JSAE Annual Spring Congress & Exposition

18-20 May 2011, Yokohama, Japan

Details at www.jsae.or.jp/2011haru/index_e.html

6th AVL Commercial Powertrain Conference

25-26 May 2011, Graz, Austria

Details at www.avl.com/icpc

The conference will cover powertrains for commercial, agricultural and non-road vehicles and machinery. Topics will include emissions legislation strategies, Euro VI emissions compliance and Tier 4 final (Stage IV) emissions, electrification and hybrids.

The European Electric Vehicles Conference 2011

26 May 2011, Brussels, Belgium

Details at www.eu-ems.com/summary.asp?event_id=72&page_id=518

The conference will address fundamental questions, including whether a sufficient case has been made for electric vehicles; whether Europe will deliver an infrastructure capable of facilitating the roll-out of electric vehicles; and incentive options.

2nd International Exhaust Emissions Symposium

26-27 May 2011, Bielsko-Biała, Poland

The conference will cover gaseous and particulate matter emissions; emissions legislation trends; emissions testing methods and equipment; the latest development trends in vehicular technology concerning improvements in emissions and fuel consumption; powertrain system development and powertrain test methods; and the composition of transport fuels and their influence on emissions.

Diesel Emissions Conference & AdBlue Forum Europe

15-17 June 2011, Dusseldorf, Germany

Details at www.integer-research.com/conferences/dec-europe

The conference will discuss the industries' preparations for Euro VI (on-road) and Stage IV (non-road) legislation due in 2014, led by a range of expert speakers from around the globe. The conference will also discuss the best emissions technologies available to meet diesel emissions standards.

Engine Emissions Measurement short course

20-24 June 2011, Leeds, UK

Details at www.engineering.leeds.ac.uk/short-courses/automotive/

15th ETH Conference on Combustion Generated Nanoparticles

26-29 June 2011, Zürich, Switzerland

The conference addresses characterization methods of nanoparticles for research, type-approval, in-use compliance testing, manufacturing control, and development of internal and external emissions control of internal combustion engines and other combustion technologies.

7th International CTI Conference: SCR Systems – New Developments and Further Challenges

5-6 July 2011, Stuttgart, Germany

Details at www.car-training-institute.com/scr

Topics include SCR catalyst technologies; the development of SCR Systems; their application in Diesel passenger cars and commercial vehicles; next Generation SCR Systems; and DeNOx Concepts to meet future legislation.

4th International CTI Conference: Emission Relevant Sensors

12-13 July 2011, Nuremberg, Germany

Details at www.car-training-institute.com/emission-sensors

Topics include improved functions of the next generation of narrow-band oxygen sensors, accuracy determination of active thermocouple temperature sensors, soot sensor to fulfil Euro VI OBD requirements, resistive soot sensors, robust and reliable AdBlue®-capable pressure sensor.

SAE Powertrains, Fuels and Lubricants

30 August – 2 September 2011, Kyoto, Japan

Details at www.jsae.or.jp/2011pfl

Emissions topics include aftertreatment for CI and SI engines, future automotive catalysts and converter technologies, and the effects of fuels and lubricants for automotive devices.

Diesel Emissions Conference India 2011

6-8 September 2011, New Delhi, India

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

Stakeholders from India and beyond will discuss the industries' progress in meeting Bharat Stage III & IV legislation. The conference will also showcase the latest emissions reduction technologies being used in India and across the world.

23rd International AVL Conference "Engine & Environment"

8-9 September, 2011, Graz Austria

Details at www.avl.com/conferences

The topic of this year's conference is "Mastering Powertrain Diversity". Speakers and panellists will focus on the question of how, or even whether, it is possible to manage the growing diversity with reasonable effort.

10th International Conference on Engines & Vehicles (ICE 2011)

11-15 September 2011, Capri, Italy

Details at www.sae-na.it

Topics of the conference include powertrain technology; exhaust aftertreatment and emissions; fuel injection and combustion processes; alternative and advanced power systems; and fuels.

10th Aachen Colloquium on Automobile and Engine technology

10-12 October 2011, Aachen, Germany

Papers have been solicited on innovative vehicle concepts, electric vehicles and hybrids, commercial vehicles, and automotive strategy concepts.

XIX International Symposium on Alcohol Fuels

10-14 October 2011, Verona, Italy

Details at www.isaf2011.it

Much of the conference will concentrate on biofuel production, but there is a session on alcohols and biofuels end use in transport.

Diesel Emissions Conference USA

11-13 October 2011, Atlanta, Georgia, USA

Details at https://www.integer-research.com/conferences/dec-usa

The conference will bring together leading stakeholders from around the globe to discuss the latest emissions technologies available to meet current and future legislation.

European Electric Vehicle Congress

26-28 October 2010, Brussels, Belgium

Details at www.eevc.eu

A plenary session will be dedicated to the strategic policy for "Europe's vision and action plan", two full days will be R&D oriented but industry and political aspects will not be forgotten. The last part of the conference will then gather participants in round tables discussions on topics including plug-in hybrids, hydrogen and fuel cells, and health.

SAE 2011 Small Engine Technology Conference

8-10 November 2011, Sapporo, Japan

Details at www.setc-jsae.com

The conference will cover products such as ATVs, motorcycles, generators and agricultural/gardening equipment, focussing on combustion engines but also covering hybrids and electric drive.

The Spark Ignition Engine of the Future

30 November – 1December 2011, Strasbourg, France

Details at http://www.sia.fr/evenements.htm

This conference is intended to provide the opportunity for technical experts and executives from the automotive and oil industries, external analysts, research labs and universities to exchange information on the potential of the future spark ignition engine to respond to the main challenges of mobility, CO_2 emissions and hybridization.

Fuel Systems for IC Engines

14-15 March 2012, London, UK

Details at www.imeche.org/events/c1342

This conference will focus on the latest technology for system design, characterisation, measurement, and modelling of diesel and gasoline fuel injection systems. This will range from fundamental fuel spray theory, component design, to effects on engine performance, fuel economy and emissions.

Transport Research Arena Conference

23-26 April 2012, Athens, Greece

Details at www.traconference.eu/

The conference brings together academia and industry from Europe and the rest of the world to present research (theoretical and applied) on pressing problems of the transport.

SAE 2012 World Congress

24-26 April 2012, Detroit, Michigan, USA

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