



Newsletter

September - October 2010

INTERNATIONAL REGULATORY DEVELOPMENTS

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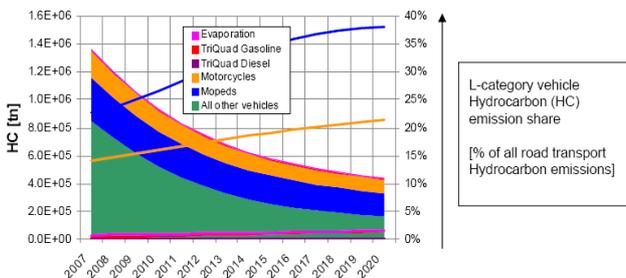
EUROPE

Proposals for new Motorcycles Regulation published

On 4 October 2010, the Commission published its proposal for revision of the current 15 Directives on motorcycles. The revision will reduce these to one co-decision Regulation and 4 delegated and implementing Regulations, one of which will include the details of emissions test procedures. (Directives must be transposed into national legislation by each Member State; Regulations are directly-applicable). The package of 5 Regulations is anticipated to become applicable on 1 January 2013.

The proposal covers all L-category vehicles: two- or three-wheel powered cycles, two- or three-wheel mopeds, motorcycles with and without a side-car, tricycles, on-road quads and mini-cars, but excludes off-road quadricycles (ATVs). It covers safety and emissions requirements and, the Commission says, foresees adaptation to the latest and anticipated near-future vehicle construction and propulsion technologies. Wherever possible references to UN-ECE global technical regulations (gtr's) will be used.

Regarding emissions, the Commission says that although emissions from road transport are decreasing, the share of the L-category vehicle fleet to these emissions is significantly increasing. For example for hydrocarbons the share is estimated to be 38% today and will rise to 62% in 2020 in case of



no action. For carbon monoxide (CO) this share is 20% today and is anticipated to rise to 38% in 2020. The L-category vehicle fleet is also a high contributor to volatile particle emissions in urban areas leading to smog and adverse effects on people's health.

The Commission proposes three new emissions steps, over the coming decade. There will be Euro 3, 4 and 5 steps for all L-category vehicles with a Euro 6 step for motorcycles which are already at Euro 3. The new steps will have to be complied with in 2014, 2017 and 2020, respectively. This staggered approach will, the Commission says, provide sufficient lead-time to the vehicle manufacturers to introduce the necessary pollutant abatement technology.

Durability requirements will also be introduced, together with OBD requirements and measurement of CO₂ and fuel consumption.

Step 1:

- Optional for New Types from 1 July 2013,
- Obligatory for New Types from 1 January 2014,
- Obligatory for Existing Types from 1 January 2015

Vehicle category	Euro level	Propulsion	mg/km					Cold-start Cycle
			CO	THC	NOx	PM	THC+NOx	
L1Ae: powered cycle	Euro 3	PI, CI, hybrid	560	100	130	-	-	ECE R.47
L1Be: 2-wheel moped	Euro 3	PI, CI, hybrid	1000	-	-	-	1200	
L2e: 3-wheel moped	Euro 3	PI, CI, hybrid	3500	-	-	-	1200	
L3e: 2-wheel motorcycle	Euro 4	PI, V _{max} <130km/h	1970	560	130	-	-	WMTC Phase 2
L4e: motorcycle + sidecar	Euro 3	PI	1970	250	170	-	-	
L5Ae: passenger tricycle	Euro 3	PI, V _{max} ≥130km/h	1970	250	170	-	-	
L7Ae: heavy on-road quad	Euro 3	CI, hybrid	1000	100	570	100	-	
L5Be: commercial tricycle	Euro 3	PI, CI, hybrid	4000	1000	250	-	-	ECE R.40
L6Ae: light on-road quad	Euro 3	PI	3500	150	650	-	1200	ECE R.47
L6Be: light mini-car	Euro 3	CI, hybrid	1000	150	650	100	-	ECE R.40
L7Be: heavy mini-car	Euro 3	PI, CI, hybrid	4000	1000	250	-	-	ECE R.40

PM limits apply only to CI and CI hybrids. NB: All limits are after cold start – the current Euro 2 requirement for mopeds has the same limit values as proposed for Euro 3, but on a hot-start test.

Step 2:

- Optional for New Types from 1 January 2015,
 - Obligatory for New Types from 1 January 2017,
 - Obligatory for Existing Types from 1 January 2018
- (Changed limits are shown in shaded boxes)

Vehicle category	Euro level	Propulsion	mg/km					Cold-start Cycle
			CO	THC	NOx	PM	THC+NOx	
L1Ae: powered cycle	Euro 4	PI, CI, hybrid	560	100	70	-	-	ECE R.47
L1Be: 2-wheel moped	Euro 4	PI, CI, hybrid	1000	630	170	-	-	
L2e: 3-wheel moped	Euro 4	PI, CI, hybrid	1900	730	170	-	-	
L3e: 2-wheel motorcycle	Euro 5	PI, V _{max} <130km/h	1140	380	70	-	-	WMTC Phase 2
L4e: motorcycle + sidecar	Euro 4	PI	1140	170	90	-	-	
L5Ae: passenger tricycle	Euro 4	PI, V _{max} ≥130km/h	1140	170	90	-	-	
L7Ae: heavy on-road quad	Euro 4	CI, hybrid	1000	100	300	80	-	
L5Be: commercial tricycle	Euro 4	PI, CI, hybrid	2000	550	250	-	-	ECE R.40
L6Ae: light on-road quad	Euro 4	PI	1900	730	170	-	-	ECE R.47
L6Be: light mini-car	Euro 4	CI, hybrid	1000	100	550	80	-	ECE R.40
L7Be: heavy mini-car	Euro 4	PI, CI, hybrid	2000	550	250	-	-	ECE R.40

PM limits apply only to CI and CI hybrids. NB: All limits are after cold start

Step 3:

- Optional for New Types from 1 January 2018,
 - Obligatory for New Types from 1 January 2020,
 - Obligatory for Existing Types from 1 January 2021
- A new column for NMHC limits is added.

Vehicle category	Euro level	Propulsion	mg/km					Cold-start Cycle
			CO	THC	NMHC	NOx	PM	
L1Ae: powered cycle	Euro 5	PI, CI, hybrid	500	100	68	60	4.5	Revised WMTC
All other L categories	Euro 5 (Euro 6 for L3e)	PI	1000	100	68	60	4.5	
		CI, hybrid	500	100	68	90	4.5	

PM limits apply to CI, CI hybrids and GDI engines. For L1Ae the text implies that it applies only to GDI.

By 1 January 2016 the Commission has to carry out an environmental effect study. This must evaluate air quality and the share of pollutants contributed by L-category vehicles. From this the Commission has to confirm the Euro 5 (Euro 6 for L3e motorcycles) enforcement dates, emissions limits, durability requirements and in-service conformity testing requirements, plus OBD and evaporative emissions test requirements. The study must also determine the feasibility, the associated enforcement date and for which (sub-)categories of vehicle off-cycle emission

requirements should be introduced beyond the Euro 5 level (Euro 6 for L3e motorcycles).

Durability requirements vary by vehicle category and emissions step. Assigned multiplicative deterioration factors can be used or actual durability performance testing can be conducted:

Vehicle category		Step 1	Step 2	Step 3
		km		
L1Ae: powered cycle		5000	5500	6000
L1Be: 2-wheel moped		10 000	11 000	12 000
L2e: 3-wheel moped				
L6Ae: light on-road quad		18 000	20 000	30 000
L3e: 2-wheel motorcycle	$V_{max} < 130$ km/h			
L4e: motorcycle + sidecar				
L5e: tricycle (all)				
L6Be: light mini-car				
L7Be: heavy mini-car				
L3e: 2-wheel motorcycle	$V_{max} \geq 130$ km/h	30 000	35 000	50 000
L4e: motorcycle + sidecar				
L7Ae: heavy on-road quad				

The proposals also include powertrain tampering prevention, primarily as a safety measure, particularly applicable to mopeds, light motorcycles, and mini-cars. Another safety measure is a requirement for an automatic headlamp-on feature equivalent to daytime running lights for cars. The option for Member States to mandate that motorcycles be limited to a maximum power of 74 kW will not be maintained.

The Commission also considers it necessary to introduce enhanced market surveillance requirements "to create a level playing field for all vehicle manufacturers in a sector where presence of non-compliant products may cause significant safety risks and environmental threats." The role and responsibilities of the authorities in the Member States in charge of type-approval and market surveillance are clarified in the Regulation, and the requirements relating to the competence, obligations and performance of the technical services that perform vehicle type-approval are reinforced. There are also objectives to ensure an equal treatment of non-compliant products throughout Europe.

The proposal can be consulted at http://ec.europa.eu/enterprise/sectors/automotive/document/s/proposals/index_en.htm#h2-1.

Transport Ministers reach Political Agreement on Eurovignette

The Belgian EU Presidency has succeeded in steering a political agreement on revision of the 'Eurovignette' Directive on charging heavy goods vehicles for the use of infrastructure. The agreement paves the way to charging on the basis of pollution and noise levels. In the agreed version, 4-year exemptions are included for vehicles meeting the most stringent emissions standards, so Euro V vehicles will be exempted until the end of 2013 and Euro VI vehicles until the end of 2017.

The agreement will enable, but not oblige, Member States to charge tolls to heavy-duty vehicles to cover the external costs resulting from the road transport of goods. They can be used to cover the costs of air pollution and noise. Under the compromise Member States will be able to limit the scope to vehicles of 12 tonnes and over. The clause of the existing Eurovignette Directive establishing an extension to vehicles of 3.5 tonnes from 2012 is consequently modified.

The compromise will enable the EU institutions to begin negotiations for the second reading in the European Parliament. The European Commission supports the agreement although it was said to be disappointed over certain compromises.

About Half of EU Member States expected to exceed Emissions Ceilings

In 2010, around half of the European Union's Member States expect to surpass one or more of the legal limits set by the National Emission Ceilings (NEC) Directive, according to the European Environment Agency (EEA).

The NEC Directive covers emissions of SO₂, NO_x, non-methane volatile organic compounds (NMVOCs) and ammonia. EEA's annual status report released on 24 September 2010 confirms that 11 countries anticipate an exceedance of their ceilings for NO_x, some by more than 40%.

Of the four pollutants covered by the NEC Directive status report 2009, Member States have the greatest difficulty meeting the NO_x limits. Only 16 expect to remain within their respective NO_x ceilings, with road transport bearing much of the blame. The road transport sector contributed around 40% of total EU-27 NO_x emissions in 2008 and although its overall emissions have decreased since 1990, the reduction has not always been as large as originally anticipated. This is partly, EEA says, because the sector has grown more than expected and partly because vehicle emissions standards, especially those for diesel vehicles, have not always delivered the foreseen level of NO_x reductions.

Several Member States, including Slovenia, Sweden and the United Kingdom, expect to exceed their respective NO_x ceilings by small margins (less than 5%). In contrast, France and Spain expect to exceed their ceilings by 32% and 28% respectively. Other countries, expecting lower surpluses in absolute (kt) terms, would exceed their limits by even larger margins, notably Austria (42%), Belgium (43%) and Ireland (47%).

The report (EEA technical report no. 10/2010) is available from www.eea.europa.eu/publications/nec-directive-status-report-2009.

Recession accelerates the Decline in EU Greenhouse Gas Emissions

According to the European Environment Agency's new estimates, EU-27 and EU-15 greenhouse gas emissions both decreased by 6.9% in 2009 compared to 2008. Based on these estimates, the EU-27's 2009 emissions stand approximately 17.3% below the 1990 level and therefore very close to the bloc's target of cutting emissions 20% by 2020. The EU-15 stands 12.9% below the base-year level, exceeding (for the first time) its Kyoto 8% reduction commitment.

Consumption of fossil fuels fell by 5.5% in 2009 compared to the previous year. The strongest impact on greenhouse gas emissions came from the sharp (12.7%) drop in coal use. At the same time, renewable energy use (excluding biomass) increased significantly, rising by 8.3%. In relative terms, the largest emissions reductions occurred in industrial processes reflecting lower activity levels in the cement, chemical and iron and steel industries.

Consultation on Sulfur Content of Marine Fuels

DG-Environment has launched a consultation on proposals to update the 1999 EU Directive on the sulfur content of marine fuels to align it with the International Maritime Organisation (IMO) standards.

The consultation covers the updating of the Directive so that fuel sulfur content requirements match those of IMO. This would entail a reduction from 4.5% to 3.5% S for marine fuels for general use and a reduction from 1.5% to 1% (with a further reduction to 0.10% from 1 January 2015) for fuel used in Sulfur Emission Control Areas (SECAs). The North Sea, English Channel and Baltic Sea are designated as SECAs. IMO rules also allow the use of abatement equipment to reduce sulfur emissions, but EU legislation currently only allows its use in short-term trials. The consultation asks whether permanent use of abatement should be permitted.

Currently, passenger ships operating outside of a SECA but on regular services to or from EU ports are required to use marine fuels with a maximum permitted sulfur content of 1.5%, corresponding to the previous IMO requirement for SECAs. The questionnaire asks whether the new SECA standards (1.0% S from 1/7/2010, 0.10% from 1/1/2015) should also be applied to passenger ships visiting EU ports outside SECA areas. It also asks whether this should be extended to cruise ships.

The consultation documents note that the Commission intends to address issues such as the designation of Emission Control Areas (ECAs) "in a more comprehensive manner when reviewing the

EU's air quality policies in 2013. The Commission intends to have additional public consultations on these important matters from spring 2011 onwards." Nevertheless, the questionnaire also asks if additional ECAs should be designated.

The consultation is on the DG-Environment website: <http://ec.europa.eu/environment/consultations/sulphur.htm>.

Netherlands calls for Rapid Move to Euro VI

The Council of Transport Ministers, meeting in Brussels on 15 October 2010, received a presentation on heavy-duty vehicle emissions from the Dutch delegation. The presentation advocated a rapid move towards widespread use of Euro VI buses and lorries and called for robust measures for the implementation of Euro VI standards to ensure that engines homologated to the standard actually comply with emissions limit values during their entire life cycle.

Recent research has, the Dutch paper said, "shown that under certain circumstances actual NOx emissions are in practice much higher than previously estimated. If actual emission levels turn out to be higher than estimated, this could lead to serious problems in meeting national emission ceilings, air quality limit values and European policy targets for nature conservation...Effective and reliable introduction of the Euro VI norm is therefore of utmost importance to bridge the gap between type approval and practice. Above all, this calls for the establishment of robust implementation measures that will secure 'in service conformity' of heavy motor vehicle engines."

Belgian EU Presidency calls for EU Policy Framework on Indoor Air Pollution

Belgium has called for an EU policy framework to tackle indoor air quality. Initiatives such as those taken in France and Germany should be harmonised to avoid breaches of internal market rules, Belgian Environment Minister Paul Magnette said at a Conference on Product Policy and Indoor Air Quality on 23-24 September 2010.

M. Magnette said "For a long time, all the focus has been on the quality of outdoor air. In Europe, we spend an average of over 80% of our time indoors, be it at home, at school, at work or in public transport. Indoor air quality has significant impact on our health." He said that the European Commission should draft a green paper to outline options for setting up a framework so as to enable definition of the main policy and technical guidelines for the years to come.

Germany drops Plan to increase Motorway Tolls

The German government announced on 8 September 2010 that it has abandoned plans to increase motorway tolls for Euro III lorries by €0.02 per kilometre. At the same time, charges for cleaner lorries would have been cut by €0.1. The government has now decided to skip further steps and leave the tolls unchanged until the end of the existing legislative period in 2013.

The logistics sector welcomed the decision, but green group VCD urged members of the Bundestag to reject it. According to VCD, Euro III lorries currently account for more than 25% of all tolled haulage distances in Germany.

Changes to Swedish Environmental and CO₂ Vehicle Taxes and Subsidies

Sweden's government has announced a 2011 budget plan that includes new subsidies for low-emissions cars and changes to the carbon tax on vehicles.

The plan would extend graded subsidies for environmentally friendly vehicles and would impose new tax rates for higher-emissions models. The Finance Ministry said that from 1 January 2011, subsidies of up to SEK 40 000 (€4 200) per vehicle would be available for the most environmentally friendly vehicles. Additional incentives would continue for vehicles using electricity or a gas other than LPG, the ministry said.

The ministry also said that the country's CO₂-based vehicle tax would increase from SEK 15 (€1.58) to SEK 20 (€2.10) for each g/km of CO₂ emitted, starting in 2011, while the level at which the levy begins to be imposed would be increased from 100 g/km to 120 g/km. From 1 January 2011, new light trucks, buses, and motor homes would be included in the tax.

SEK 50 million (€5.25 million) per year would be allocated to a national demonstration programme for electric cars and hybrids between 2011 and 2014 to speed up their introduction into the marketplace.

Italy implements Air Quality Directive

Italy has become the latest EU Member State to transpose the revised 2008 Air Quality Directive into national law. A decree implementing the Directive has now been published in Italy's Official Journal.

EU countries had until 11 June 2010 to publish their national implementation of the Directive, but only six Member States had notified the Commission of their implementing measures in June, when DG-Environment sent a first warning to the remainder. Germany and Italy have since complied. A final

warning will be sent to those that have still not implemented the revised Directive in November 2010.

A recent report from Italian environmental groups Legambiente and Ambiente Italia, in conjunction with Il Sole 24 Ore, an Italian financial daily paper, said that every large Italian city except Turin showed an erosion of its urban environment over the past year. The Urban Ecosystem Report evaluated 71 cities for a range of environmental factors including air quality.

Aberdeen, Scotland, considers Low Emission Zone

The City Council of Aberdeen, Scotland, is putting its draft Air Quality Action Plan out to public consultation.

Part of the city centre has been an Air Quality Management Area (AQMA) since 2001 due to concentrations of NO₂ and PM₁₀. Two further AQMAs were declared in November 2008. The council says that road traffic is the main source of the raised pollution levels in Aberdeen.

The council's new draft Air Quality Action Plan 2010 covering the three AQMAs contains a wide range of measures that can be implemented to improve air quality. These include consideration of the feasibility of introducing a Low Emission Zone (LEZ) in the city centre and traffic management measures such as improved signalling, Heavy Goods Vehicle priority measures and a High Occupancy Lane.

UK Report on Black Carbon Monitoring

The UK's National Physical Laboratory (NPL) has released its report for 2009 on the UK's Black Carbon monitoring network of 22 aethalometers.

Measured annual average Black Carbon concentrations ranged from 1.0 µg/m³ measured at Folkestone, Kent in southern England to 10.0 µg/m³ measured at Marylebone Road, London. The network mean for Black Carbon concentration was 2.1 µg/m³. Urban centre sites and urban background sites gave comparable measurements, with the lowest measurements being made at the Harwell, Oxfordshire (rural) and Folkestone (suburban) sites.

Daily averages of the measurements show that the highest concentrations of Black Carbon are found at the beginning of the week with the weekends generally having lower values. The hourly averages of Black Carbon broadly show a commuter traffic based signature with the exception of Strabane and Dunmurry (both in Northern Ireland). Both these sites show elevated levels from 15:00 hrs to 23:00 hrs, which is probably due to local domestic heating.

The report can be downloaded from www.airquality.co.uk/reports/cat05/1009031405_2009_BC_Annual_Report_Final.pdf.

Greenpeace speaks out against Use of Diesels in Athens and Thessaloniki

The case against allowing the use of diesel-powered vehicles in Athens and Thessaloniki was made by Greenpeace Hellas on 22 September 2010, in an announcement to mark 'World Day Without Cars'.

According to the environmental group, allowing cars using diesel will lead to a massive increase in emissions of nitrogen oxides and greatly worsen photochemical smog and accumulations of ground-level ozone during summer months. Greenpeace said that diesel engines still lag significantly behind petrol engines in terms of lowering nitrogen oxide emissions, even with the stricter limits of Euro 5.

The group pointed out that emissions limits for diesel-fuelled vehicles in Europe remain higher than those in the US, even when Euro 6 comes into force. In addition, Greece has the third largest percentage of stations where ozone concentrations exceeded alert levels during the summer of 2009 (50%) and was fourth in line as the country with the most days when levels exceeded long-term targets for the protection of human health, at 160 days.

New Danish Emissions Requirements for Commercial and Fishing Vessels

Denmark has notified the EU of orders from the Danish Maritime Authority affecting emissions requirements for commercial and fishing vessels. An 'order on notice E' applies to fishing vessels with lengths of more than 15 m and an 'order on notice F' applies to smaller commercial vessels and fishing vessels. Chapter XXVI of the revised orders covers the prevention of air pollution from ships. The most important amendments to the chapter, Denmark says, are the 'incremental intensification' of the SO_x and NO_x emissions requirements, although no further details are provided.

Malta updates its Fuel Regulations

The Maltese government has notified the European Commission of an amendment to the country's Quality of Fuels Regulations.

The amendment implements the revised EU Fuel Quality Directive, 2009/30/EC. The amendment thus affects the sulfur content of fuels, particularly for non-road applications; the maximum biofuel content of petrol and diesel; and limitations on the MMT content of fuel and marking of the use of metallic additives.

Finland examining 'Green Highway'

Finland is planning to build a carbon-neutral highway, placing filling stations for electric and biofuel-powered cars as well as for conventional ones, smart lighting

systems and clean energy production facilities along the route.

The municipality of Loviisa is currently studying whether the project, on a stretch of the E18 linking Helsinki to Vaalimaa near the Russian border, is feasible. The project goes beyond the highway itself and is being undertaken to test the government's model for a "sustainable development corridor," integrating economic development, transport and the environment. The idea is to include local economies in the project through local ethanol production from waste and other resources found along the route. Electricity generated from wind and solar sources would provide the power for electric cars and the infrastructure along the way. Smart lighting systems and geothermal heat pumps are also foreseen.

The project leaders are planning to apply for EU support through the Trans-European Networks in Transport (TEN-T) initiative. Signatories engaged in the project include energy companies Fortum and Neste Oil, the cities of Loviisa, Porvoo and Hamina along the route, and Ensto, a technology company. The project's preparatory phase runs until April 2011. Implementation of the project, at a cost of some €700 million, could start straight afterwards and be completed by 2016.

Russia proposes Linking Tax Rates to Emissions Levels

Russia's Industry and Trade Ministry has made a proposal to link vehicle's tax rates to their emissions class starting from 2011, the daily business paper *Vedomosti* reports.

The ministry has proposed keeping the basic tax rate for vehicles meeting Euro 4 emissions standards unchanged at 2.5 to 15.0 roubles (0.06 to 0.37 euro) per unit of horsepower depending on the vehicle's power, while the basic tax rate could be increased by about 20% for vehicles meeting Euro 3 standards and by about 60% for those meeting only Euro 2 standards. The ministry has also proposed that the tax rate for vehicles produced before 1 January 2006, when the Euro 2 standard was introduced in Russia, be doubled. On the other hand, the rate for vehicles meeting Euro 5 could be decreased by 30%.

Russian regions would keep the right to increase the tax rate tenfold as a maximum or abolish it for vehicles below 150 horsepower.

Deputy Industry and Trade Minister Andrei Dementyev reportedly believes the differentiated vehicle tax rates would stimulate the population to buy vehicles with better emissions standards. Sergei Belyakov, a department director at the Economic Development Ministry, is reported to support the proposal to tie the tax rate to the vehicle's emissions

class. The Finance Ministry believes that the Russian regions should keep the right to set the tax rates depending on emissions standards, according to Deputy Finance Minister Sergei Shatalov.

Lukoil starts Sales of 10 ppm Sulfur Diesel in Russia

Russian oil company Lukoil has started retail sales of diesel fuel meeting the Euro 5 (10 ppm sulfur) standard in Russia. Lukoil produces the fuel at its refineries in the cities of Nizhny Novgorod, Perm and Ukhta. The fuel is sold under the EKTO Diesel brand.

NORTH AMERICA

US sets Greenhouse Gas Standards for Trucks

On 25 October 2010 the US Environmental protection Agency (EPA) and the Department of Transportation (DOT) proposed the first ever fuel efficiency and greenhouse gas emissions standards for trucks.

The initiative covers a range of vehicles from delivery vans to long-haul trucks, and is, the US administration says, expected to cut nearly 250 million tonnes of greenhouse gas emissions over the lifespans of vehicles produced within the programme's first five years. The joint proposed standards cover not only engines but also the complete vehicle. In addition to CO₂ and fuel consumption standards, EPA is proposing standards for air conditioning related emissions of HFC from pickups, vans and truck tractors; as well as N₂O and CH₄ standards applicable to all heavy-duty engines, pickups and vans.

The regulation, which would not be final until mid-2011, covers new trucks for model years 2014 to 2018. The standards are divided among three categories of vehicle. Under the proposal, starting in 2014 tractor units for articulated trucks will have to achieve up to a 20% reduction in carbon emissions and fuel consumption by the 2018 model year. Heavy-duty pickup trucks and vans will have separate gasoline and diesel standards beginning in the 2014 model year, with a target of an up to 10% reduction for gasoline vehicles and a 15% cut for diesel vehicles by the 2018 model year. So-called 'vocational vehicles', such as concrete mixers, firetrucks, garbage trucks and buses, would need to reach up to a 10% reduction in fuel use and carbon emissions during the same period.

Two types of standard metrics are proposed: payload-dependent gram per mile (and gallon per 100-mile) standards for pickups and vans; and gram per ton-mile (and gallon per 1000 ton-mile) standards for vocational vehicles and combination tractors. These proposed metrics account for the fact that the work to

move heavier loads burns more fuel, and emits more CO₂ than in moving lighter loads, EPA says.

Table 1: Proposed MY 2017 Combination Tractor Standards

	EPA Emissions Standards (g CO ₂ /ton-mile)			NHTSA Fuel Consumption Standards (gal/1,000 ton-mile)		
	Low Roof	Mid Roof	High Roof	Low Roof	Mid Roof	High Roof
Day Cab Class 7	103	103	116	10.1	10.1	11.4
Day Cab Class 8	78	78	86	7.7	7.7	8.5
Sleeper Cab Class 8	64	69	71	6.3	6.8	7.0

For heavy-duty pickup trucks and vans, EPA is proposing to establish standards for this segment in the form of a set of target standard curves, based on a "work factor" that combines a vehicle's payload, towing capabilities, and whether or not it has 4-wheel drive. Each manufacturer's standard for a model year would depend on its sales mix, with higher capacity vehicles (payload and towing) having numerically less stringent target levels, and with an added adjustment for 4-wheel drive vehicles.

Table 2: Proposed MY 2017 Vocational Vehicle Standards

	EPA Full Useful Life Emissions Standards (g CO ₂ /ton-mile)	NHTSA Fuel Consumption Standards (gal/1,000 ton-mile)
Light Heavy Class 3-5	344	33.8
Medium Heavy Class 6-7	204	20
Heavy Heavy Class 8	107	10.5

Regarding N₂O and methane, EPA says that these emissions from both gasoline- and diesel-fuelled, vehicles are relatively low today and optimised control for NMHC and NO_x also result in highly effective control of N₂O and CH₄ but some technologies could result in increases. The objective is therefore to cap existing levels rather than to require reductions.

The proposed N₂O standards are 0.05 g/mile (approx. 31 mg/km) for heavy-duty pickup trucks and vans, measured (like CO₂) as a composite of the light-duty FTP and HFET cycles with 55% city and 45% highway weightings. For all heavy-duty engines the proposal is for a cap of 0.05 g/bhp-hr (approx. 67 mg/kWh) measured over the heavy-duty FTP cycle. For methane EPA also proposes a cap of 0.05 g/mile for heavy-duty pick-up trucks and vans and 0.05 g/bhp-hr for heavy-duty engines.

EPA is also proposing to allow an alternative approach of converting the emissions to CO₂-equivalent figures and combining them with the CO₂ results. For methane the equivalence figures would mean 1 mg CH₄ counting as 25 mg CO₂ and 1 mg N₂O counting as 298 mg CO₂. EPA is also proposing a new option to use CO₂-equivalent figures for either N₂O or CH₄ (but not both) for light-duty vehicles for 2012-2014 model years as an additional flexibility to help manufacturers address any near-term issues that they may have with the N₂O and CH₄ standards.

The public will be able to comment on the agencies' proposals for 60 days. Details are at www.epa.gov/oms/climate/regulations/420f10901.htm.

CARB proposes Revisions for Stationary CI Engines and Refrigeration Units

The California Air Resources Board (CARB) has adopted amendments to the state's Airborne Toxic Control Measure (ATCM) for stationary compression ignition (CI) engines and transport refrigeration units.

The main objective for stationary CI Engines is to align the emissions limits for new emergency standby engines - for instance those used to provide emergency electrical power - with the US Environmental Protection Agency's 2006 standards. This alignment will maintain the limit of 0.15 g/bhp-hr PM for new engines used as emergency standby units operated for less than 50 hours/year, which will not require the use of emissions control devices. Legislation does, however, allow air districts in California to set more stringent site-specific emissions standards for new standby engines if they are considered to pose a unique exhaust exposure problem. New engines that operate for 50 hours or more per year will still be required by the legislation to meet emissions requirements that will force the installation of a diesel particulate filter.

For Transport Refrigeration Units (TRUs), the main change is to the in-use performance standard for some engines. The amendments would allow the option of initially meeting the less stringent low-emissions level, which requires only a level 2 verified diesel emissions control system, instead of the ultra-low-emissions performance standard, which requires retrofitting with level 3 verified systems or installation of a new engine. The change applies to 2003 model year TRU engines of ≥ 25 hp and 2003 and 2004 model year engines of < 25 hp category. Nevertheless, all 2003 and 2004 engines must meet the ultra-low emissions standard seven years after the initial compliance date (i.e. in 2017 or 2018).

California proposes Changes to Several In-Use Regulations

The California Air Resources Board (CARB) has released a number of draft proposals for amendments to existing Regulations. The changes to both the on-road and off-road regulations result from a revised emissions inventory showing that new reporting information and the economic downturn has led to lower vehicle mileages and hence reduced emissions.

The changes proposed to the On-Road Truck and Bus regulation would exempt smaller vehicles from meeting PM filter requirements and would delay the first replacements for all trucks until 2015. No engine less than 20 years old would be replaced until 1 January 2020.

For trucks with a gross vehicle weight rating (GVWR) less than 26 001 lbs (11.8 tonnes) there are no requirements until 2015. Between then and 2020, engines must be replaced when they are 20 years old. All must have 2010 engines by 2023. For trucks with a GVWR $> 26,000$ lbs, operators must follow a compliance schedule that lists requirements by engine model year. The schedule requires PM filters from 2012 to 2014 on 1998 to 2006 model year engines and replaces 20 year old or older engines from 2015 to 2020. All trucks must have 2010 engines by 2023. There are phase-in options for smaller fleets and exemptions for low usage engines.

Changes to the Drayage Truck Rule include changing the definition to include drayage trucks (trucks that load, unload or transport cargo) that operate outside port or rail yard properties and expanding the scope to cover all trucks $> 26,000$ lbs GVWR starting in 2014. The requirements are to be harmonised with the Truck and Bus Rule. There will be no Phase 2 requirement to modernise to 2007 engines; 1994-2003 MY engines will have to have PM filters by 2010, 2004 MY engines by 2012 and 2005-2006 MY engines by 2013.

The changes proposed for the In-Use Off-road Diesel Vehicle Regulation would delay the start of requirements by 4 years for large fleets and by 2 years for small and medium fleets. The fleet average emission targets combine PM and NOx emission rates and the Best Available Control Technology (BACT) compliance treats retrofits and turnover as being interchangeable. The amendments would lower the annual BACT requirements so that no more than 5 to 10% of a fleet's horsepower would need to be cleaned up every year, instead of 28 to 30%. Turnover in place of retrofitting would be allowed, but the double credit for early retrofits would be extended. NOx targets for 2017 to 2022 would, however, be lowered, requiring more Tier 4i and Tier 4 engines.

There are also amendments to and clarifications of the Large Spark Ignition Engines Rule. These would, for instance, allow operators to apply for a two-year extension when no retrofits are available.

The final proposal from CARB staff is due to be presented to the board at its meeting in December 2010. All the proposals are available at www.arb.ca.gov/msprog/onrdiesel/workshops.htm.

US Interim Report on Future GHG and Fuel Economy Standards

On 30 September 2010 the US Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) and the US Environmental Protection Agency (EPA), issued a Notice of Intent to begin the process of developing tougher greenhouse gas and fuel economy standards

for passenger cars and trucks built in model years 2017 to 2025.

In conjunction with this, EPA, NHTSA and the California Air Resources Board (CARB) released an Interim Joint Technical Assessment Report, presenting the agencies' initial assessment of the potential cost, effectiveness and lead-time requirements for over 30 technologies that could be available to move towards new standards for the period to 2025.

The three agencies evaluated scenarios representing 3%, 4%, 5%, and 6% annual increases in overall average stringency (roughly equivalent to 47 to 62 miles per US gallon - 5 litres/100 km to 3.8 l/100 km - in 2025, if all improvements were made using fuel economy-improving technology), using a range of illustrative technology pathways. The technology pathways are intended to show the different cost impacts of achieving different levels of stringency, if the industry were to place more or less emphasis on hybrids, plug-in hybrids, and electric vehicles as compared to advanced gasoline technologies and vehicle mass reduction.

This initial assessment projected vehicle cost estimates of approximately \$800 to \$3500 (€568 to €2486) and lifetime savings due to reduced fuel costs of about \$5000 to over \$7000 (€3550 to about €5000), depending on the phase-in stringency scenario and the technology pathway. The assessment also considers compliance flexibilities available to manufacturers, potential impacts on auto industry jobs, and the infrastructure needed to support advanced technology vehicles.

The analysis by the three organisations will continue, and as part of that process, the agencies will meet with stakeholders to better determine what level of standards might be appropriate. The agencies aim to issue a Final Rulemaking by 30 September 2011.

The Interim Joint Technical Assessment report is available at www.epa.gov/otaq/climate/regulations/ldv-ghg-tar.pdf

Canada Sets Greenhouse Gas Emissions Standards for 2011-2016 Model Years

On 1 October 2010, Canada's Environment Minister unveiled final regulations to impose progressively more stringent greenhouse gas emissions standards for new passenger cars and light trucks for the 2011-2016 model years.

The regulations, which largely mirror US standards, are expected to reduce vehicles' greenhouse gas emissions in the 2016 model year by 25% from 2008 levels. They establish fleet average emissions standards aligned with the US national fuel economy

programme, with special provisions for the 2011 model year; create an emissions credit trading system; and include mandatory annual reporting of fleet average emissions performance. A special incentive is provided for advanced technology vehicles, including electric, plug-in hybrid, and fuel cell vehicles and the regulations include 'early adopter' credits for companies that exceed specified standards for the 2008-2010 model years.

On 16 October 2010, Environment Canada also published formal notice of its intent to develop more stringent greenhouse gas emissions standards for 2017 and later model years. Following this, the agency issued a consultation on future regulations to reduce greenhouse gas emissions from heavy-duty vehicles, starting with the 2014 model year. Final Regulations are expected in late 2011.

British Columbia, Canada, delays Retrofit Requirement for 6 Months

British Columbia's Ministry of Transportation and Infrastructure announced on 8 October 2010 that it will allow truck owners at least another six months to comply with the province's diesel retrofit requirement. The regulation had been due to take effect on 1 October 2010.

The ministry said that the regulation, which requires 1989 to 1993 model year heavy-duty vehicles (>8200 kg) registered in the province to be retrofitted with a verified diesel oxidation catalyst or equivalent, was being delayed because many of the required emissions control components were not currently available.

Environmental Groups want GHG Emissions Limits for Rail Locomotives

Friends of the Earth (FoE), the International Center for Technology Assessment and the Center for Biological Diversity have petitioned the US Environmental Protection Agency (EPA) to set limits for greenhouse gas and black carbon pollution from rail locomotives.

According to FoE's press statement, locomotives are a significant source of global warming pollution and in 2008 released more than 50 million tons of CO₂, ranking second among mobile non-road sources of greenhouse gas pollution. Locomotives also emit, FoE says, more than 25 000 tons of PM_{2.5} particle pollution each year including significant amounts of black carbon. The organisations say that pollution from locomotives is expected to grow in the coming decades but there are already cost-effective technologies to reduce greenhouse gas and black carbon pollution from locomotives, and more are under development.

California Policy Advice on Swapping Retrofit Components

The California Air Resources Board (CARB) has issued an advisory notice that outlines the policy on swapping of diesel emission control system (DECS) components or complete systems between vehicles.

California's legislation on the verification, warranty and in-use compliance of retrofit systems include restrictions on how they can be swapped or 're-designated' among different vehicles and equipment. The new advisory notice is intended to alert owners, installers, distributors, and manufacturers of verified systems to the specific requirements that must be met when swapping components from one DECS to another or moving an entire DECS from one vehicle to another (re-designation). The complete Advisory may be found at <http://www.arb.ca.gov/enf/advs/msadvlist.htm>.

California proposes changes to Fuel Regulation for Ocean-going Ships

The California Air Resources Board (CARB) has expressed concern that many ships are moving their routes further out to sea to avoid the State's current cleaner fuel regulations. The current regulations require use of marine middle-distillate fuels instead of heavy fuel oil within 24 miles of the coast.

Since implementation of the requirement in July 2009 a large number of vessels have chosen to move to a route on the southern side of the Channel Island, an area outside of the regulated zone.

As a result, CARB is proposing to extend its 24-mile boundary for the regulation to beyond the Channel Island to capture the vessels that have moved to that route. The shipping industry has opposed CARB's regulation and is expected to also oppose the expansion. The industry argues that federal and international law, rather than Californian legislation, governs anything beyond 3 nautical miles of the coast.

Port of Los Angeles to offer Reduced Tariff for Zero-Emission Vehicle Shipment

The Los Angeles Harbor Commission has approved a plan to offer a reduced tariff for zero-emission vehicles imported and exported through the port.

The 15% tariff reduction, available to all vehicle manufacturers, was targeted at Chinese manufacturer BYD Auto Company Limited (BYD) as part of the City's proposal to bring BYD's North American headquarters to Los Angeles and use the Port of Los Angeles as its primary US shipping gateway. The "Zero-Emission Vehicle Tariff Measure" is the first of its kind in the maritime industry, says the Port Authority. It will take effect upon approval by the Los Angeles City Council.

New York awards Funding to Reduce Emissions from Ferries.

The New York State Energy Research and Development Authority (NYSERDA) has announced that it has awarded funding of \$1.3 million (approx. €0.9 million) for the supply of diesel emissions reduction technology to NY Waterway, New York City's largest private ferry fleet.

The grant will allow the supply and installation of diesel oxidation catalysts (DOC's) to more than 20 ferries. Following the DOC installation, a sample of vessels will undergo an evaluation period that will simulate normal passenger operation. The aim of the evaluation is to measure and verify emissions reductions prior to resuming normal operations. The evaluation period is anticipated to last 12 months.

US allows Gasoline Blends with up to 15% Ethanol

The US Environmental Protection Agency (EPA) has waived a limitation on selling fuel that contains more than 10% ethanol, but only for model year 2007 and newer cars and light trucks. The waiver allows up to 15% ethanol (E15). EPA Administrator Lisa P. Jackson made the decision after a review of the Department of Energy's (DOE's) extensive testing and other available data on E15's impact on engine durability and emissions. Pumps selling E15 will have to be labelled.

"Thorough testing has now shown that E15 does not harm emissions control equipment in newer cars and light trucks," said EPA Administrator Lisa P. Jackson. A decision on the use of E15 in model year 2001 to 2006 vehicles will be made after EPA receives the results of additional DOE testing, which is expected to be completed in November 2010. However, no waiver is being granted this year for the use of E15 in model year 2000 and older cars and light trucks, or in any motorcycles, heavy-duty vehicles, or non-road engines. This is because currently there is not the testing data to support a waiver.

Canadian Renewable Fuels Regulations

Canada has finalised its regulations on the renewables content of petrol. The final regulation, which comes into effect on 15 December 2010, will require an average of 5% renewable content.

Providing demonstrations of technical feasibility under the range of Canadian conditions are successful, an amendment to the Renewable Fuels Regulations will also introduce a 2% requirement for the renewable content of diesel fuel and heating oil.

SOUTH AMERICA

Chile's Environment Ministry to Tackle Air Pollution, Climate Change as Priorities

On 1 October 2010, the Chilean government opened the doors of the country's new Environment Ministry and an autonomous Environmental Evaluation Service, the first of five new institutions that will create, implement, and enforce environment policy. The ministry will replace the National Environment Commission (CONAMA), and will be responsible for designing environmental regulations and policies.

Peru delays Mandate for Higher Biofuel Blends

Peru has decided to delay the planned roll-out of an obligatory biofuel blending mandate in the capital, Lima, and in the province of Callao. The delay is in order to avoid the need for imports, according to a press release by the Ministry of Energy and Mines. Sales of the blended fuel will now start in June 2011, rather than on 1 October 2010 as planned.

The government has been gradually rolling out an ethanol programme that makes the sale of gasoline blends with 7.8% ethanol mandatory. A total of 964 service stations across nine regions sell such blends. The extension of the mandate to the capital means that a further 949 service stations and pumps will supply it. The final region to be incorporated into the programme under the current timetable will be Tacna in July 2011.

ASIA PACIFIC

Emissions Test Centre for Vietnam

The Vietnamese Ministry of Transport's Registration Department has announced that in October 2010 it will launch a centre for testing vehicle emissions in Hanoi as part of efforts to ease pollution.

The centre, the first of its kind in Vietnam, has been funded by the Austrian government. It has been outfitted with three emissions checking systems that can test 300 motorbikes and 200 cars a year. It will check motor vehicles according to European standards before offering them to the market, the centre's head Pham Quang Thanh said. Currently Vietnamese firms had to get tests in foreign nations with high costs, he said.

Hong Kong, China, aims for Low-Emissions Zones and Retrofits

In his annual policy address to the Legislative Council of the Hong Kong Special Administrative Region, Chief Executive Donald Tsang said that environmental priorities for 2011 include designating low-vehicle-

emissions zones in heavily trafficked areas, replacing polluting buses with cleaner ones, and reducing carbon intensity. He said air quality has been "improving gradually," but roadside air pollution and concentrations of NO₂ are "still on the high side."

As current franchise contracts expire in the next few years, bus companies will be required to switch to zero-emissions vehicles or the most environmentally friendly buses available, Tsang said. He said the government will pay for six hybrid buses for franchised bus companies to use in the pilot low-emissions zones to test how they operate under Hong Kong conditions. The government would consider testing and providing full financial support for fully electric buses if bus companies wanted to consider that option, he said.

Tsang also said that since 60% of the franchised buses are currently at the Euro II and Euro III emissions levels, "there are too many to phase them out in the coming few years." The government will therefore work with the companies to retrofit buses to reach Euro IV emissions standards for NO₂, he said.

China and the US sign Agreement on Environmental Protection

The Chinese Minister of Environmental Protection Zhou Shengxian and the US Environmental Protection Agency (EPA) Administrator Lisa P. Jackson have signed an agreement formalising their countries' partnership on environmental protection.

Under the Memorandum of Understanding, EPA will continue to collaborate with China's Ministry of Environmental Protection (MEP) on the prevention and management of air pollution, water pollution, pollution from persistent organic pollutants and other toxics, hazardous and solid waste, and the development, implementation and enforcement of environmental law. The Memorandum also establishes a joint committee on science and technology cooperation.

Indian Research Programme to focus on Black Carbon

On 19 September 2010, India's Ministry of Environment and Forests announced a nationwide research programme on carbon aerosol, of which black carbon will be an integral element.

The 'National Carbon Aerosol Program' aims to enhance understanding of the sources and estimate the quantities of aerosols in the atmosphere. It will seek to answer questions such as the contribution of aerosols, especially black carbon, to regional warming and their role in atmospheric stability and the consequent effects on cloud formation and monsoons. It also will study the role of black carbon on snow melt as well as its role, if any, in Himalayan glacier retreat.

Experts have claimed to have identified black carbon as the second or third largest contributor to the current anthropogenic global warming by absorbing thermal infrared radiation from the ground and within clouds. The Intergovernmental Panel on Climate Change has included it in its Fourth Assessment Report, 2007 and proposes to cover it in its Fifth Assessment Report, in 2014 to understand its role on climate change.

India completes Change to 50 ppm Diesel in Large Cities

On 23 September 2010 Jitin Prasada, India's Minister of State for Petroleum and Natural Gas announced that the country has completed its move to 350 ppm sulfur diesel fuel and 150 ppm sulfur petrol throughout the country. 50 ppm diesel and petrol have been required in India's 13 mega-cities since April 2010.

AFRICA

Cleaner Public Transport in Kenya

The Partnership for Clean Fuels and Vehicles (PCFV), through US-EPA support is planning four workshops on cleaner public transportation in Kenya, targeting public transport owners and operators, and pump attendants. The events are to be held in the two major cities - Nairobi and Mombasa.

Kenya is enacting new standards for import of lower sulfur diesel - 500 ppm - from 5000 ppm. This lower sulfur diesel grade, which is the predominant fuel used by public transport vehicles, will be sold concurrently with the high sulfur (10 000 ppm) diesel produced by the Kenyan refinery. Even though upgrading is planned for the refinery, the availability of lower sulfur diesel presents an opportunity to promote cleaner public transportation, hence the PCFV 'sensitization' campaign. Other topics to be covered include eco-driving and the benefits of regular inspection and maintenance programmes.

Tanzania Reduces Fuel Sulfur Content

The government of Tanzania, through the Energy and Water Utilities Regulatory Authority (EWURA) will phase out high sulfur (5000 ppm) diesel from 1 January 2011 next year according to a statement issued by the authority's Director General.

The authority, in collaboration with other stakeholders, has finalised a review of technical specifications for Automotive Gas-oil from 5000ppm to 500ppm sulfur content as a National and International Standard. As the result of the review and in accordance with Section 4(d) of Petroleum Act, 2008, EWURA has issued an Order to all petroleum products importers, marketers and the public that from 1 January 2011, all diesel imported and sold in Tanzania shall be of maximum sulfur content of 500ppm.

GENERAL

China Friendship Award for Mike Walsh

Mike Walsh, the chair of the board of the International Council on Clean Transportation has received the highest honour China confers on foreign experts who have contributed to its economic and social progress. It was presented by Premier Wen Jiabao.

Walsh was nominated by the China Ministry of Environmental Protection (MEP) in recognition of his "tireless technical support" of the MEP's efforts to control mobile source emissions. Since the 1990s, he has played a critical role in helping China to develop a roadmap for regulating vehicle emissions and in particular to reach two key milestones: adopting more stringent emissions standards and securing a ban on leaded gasoline.

New Website to promote Clean Air at Mega-Events

The Clean Air Initiative for Asian Cities (CAI-Asia) Center has launched a new website to communicate to policymakers and the public on air quality management in 'mega-events' such as the Olympic Games and Expos.

The website at <http://megaevents.cleanairinitiative.org> features information on the air quality of the host cities before, during, and after their respective mega-events. Also available for download is a CAI-Asia study on "Analysis of Air Quality Management in Cities with Past and Planned Mega-Events: A Survey Report."

"As previous Olympic Games have demonstrated, major international events like this year's World EXPO in Shanghai provide unique opportunities to catalyse air quality management in these cities," says May Ajero, CAI-Asia Air Quality Programme Manager. "We want to communicate both the short-term and long-term measures that the cities are taking to improve air quality levels for these high profile events."

Clean air at mega-events will also be one of the sessions at the Better Air Quality conference from 9 to 11 November in Singapore, (www.baq2010.org). The website will continue beyond the mega-events of 2010 with the aim of inspiring other cities hosting mega-events to communicate proactively their work on reducing air pollution and greenhouse gas emissions.

RESEARCH SUMMARY

Effects of Emissions

Effect of Particulates on Heart Rate Parameters

Exposure to ambient particles has been shown to be responsible for cardiovascular effects, especially in elderly with cardiovascular disease. This study conducted in Erfurt, Germany, assessed the

association between deceleration capacity as well as heart rate variability and ambient particulate matter (PM) in patients with coronary artery disease.

The analysis showed significant effects of ambient particulate air pollution on deceleration capacity and heart rate variability parameters reflecting parasympathetic modulation of the heart in patients with coronary artery disease. The authors say an air pollution-related decrease in parasympathetic tone as well as impaired heart rate deceleration capacity may contribute to an increased risk for cardiac morbidity and sudden cardiac death in vulnerable populations.

Source: Schneider et al, Changes in deceleration capacity of heart rate and heart rate variability induced by ambient air pollution in individuals with coronary artery disease; *Particle and Fibre Toxicology* (2010) 7, p.29, [doi:10.1186/1743-8977-7-29](https://doi.org/10.1186/1743-8977-7-29).

Study Links Diabetes to Vehicular Pollution

A new study links traffic pollution with an increased risk of diabetes. The study analysed a group of 1775 women living in the Ruhr district of Germany. Between 1990 and 2006, 187 participants were diagnosed with type 2 diabetes. The risk of diabetes was found to be associated with NO₂ and PM exposure.

Living within 100 m of a busy roadway was associated with more than double the risk of diabetes for women with a lower education level compared with women in the same group who did not live near a busy roadway. Interestingly, women with higher education who lived near busy roads had no altered risk. The authors conclude that traffic-related air pollution is associated with incident type 2 diabetes among elderly women. Subclinical inflammation may be a mechanism linking air pollution with type 2 diabetes.

Source: Krämer et al., Traffic-Related Air Pollution and Incident Type 2 Diabetes: Results from the SALIA Cohort Study, *Environmental Health Perspectives* (2010) 118 (9), [doi:10.1289/ehp.0901689](https://doi.org/10.1289/ehp.0901689).

Association between Asthmatic Wheeze and Pollution

Although studies have demonstrated that air pollution is associated with exacerbation of asthma symptoms in children with asthma, little is known about the susceptibility of subgroups, particularly those with atopy. This study evaluates the hypothesis that identifiable subgroups of asthmatic children are more likely to wheeze with exposure to air pollution.

The researchers found that for the study group as a whole, wheeze was significantly associated with short-term exposures to NO₂ and PM_{10-2.5}. The association with wheeze was stronger for these two pollutants in children who were skin-test positive to cat or common fungi and in boys with mild intermittent asthma.

Source: Mann et al., Short-term effects of air pollution on wheeze in asthmatic children in Fresno, California; *Environmental Health Perspectives* (2010) 118 (10) pp.1497-1502.

Premature Deaths in California due to PM_{2.5}

Approximately 9000 people in California are estimated to die prematurely each year as a result of exposure to fine particle pollution, according to a new report issued by the California Air Resources Board (CARB).

The CARB report and its methodology were based on recent science assessments completed by the US Environmental protection Agency (EPA). As a result of this review, EPA concluded that there is a causal relationship between exposure to fine particle pollution and premature death. CARB used the same methodology and risk factors as the EPA report used and applied it to the entire state, drawing on California-specific data from 90 fine-particulate monitoring stations to estimate the number of premature deaths that can be linked to this pollution.

Source: Estimate of Premature Deaths Associated with Fine Particle Pollution in California Using the United States Environmental Protection Agency Methodology; California Air Resources Board, 31 August 2010, http://www.arb.ca.gov/research/health/pm-mort/pm-report_2010.pdf.

Cost of Damage to Crops from Ozone Pollution

The policy implications of agricultural losses caused by high concentrations of ground level ozone have been highlighted by this study which modelled ozone impacts on 14 of the most important crops grown in the Greater Thessaloniki area of Greece.

The total losses for 2002 were estimated at €42 million. However, reductions in ozone levels between 2002 and 2010 have reduced the impact of ozone on crops. The researchers estimate that these improvements reduced the economic impact of ozone by €5 million in 2010 (compared to the estimated economic impact had ozone reduction policies not been implemented).

Source: Vlachokostas, et al., Economic damages of ozone air pollution to crops using combined air quality and GIS modelling. *Atmospheric Environment*. (2010) 44, pp.3352-3361, [doi:10.1016/j.atmosenv.2010.06.023](https://doi.org/10.1016/j.atmosenv.2010.06.023).

Assessment of Exposure

Particulate Exposure in Different Transport Modes

Concentrations of ultrafine (<0.1 µm) particles (UFPs) and PM_{2.5} were measured whilst commuting along a similar route by train, bus, ferry and automobile in Sydney, Australia. Estimated commuter exposures were variable, and the highest return trip mean PM_{2.5} exposure occurred in the ferry mode, whilst the highest UFP exposure occurred during bus trips. The correlation between fractions was generally poor, and is in keeping with the duality of particle mass and number emissions in vehicle-dominated urban areas.

Source: Knibbs et al., Exposure to ultrafine particles and PM_{2.5} in four Sydney transport modes; *Atmospheric Environment*, (2010), 44 (26): pp.3224-3227, [doi:10.1016/j.atmosenv.2010.05.026](https://doi.org/10.1016/j.atmosenv.2010.05.026).

Air Quality

New understanding of key ozone reaction

The US National Science Foundation has announced that a team of scientists has, for the first time, completely characterized an important chemical reaction that is critical to the formation of ground-level ozone in urban areas. The team's results indicate that computer models may be underestimating ozone levels in urban areas during smog episodes by as much as 5 to 10%.

The reaction of a hydroxyl radical (OH) with NO₂, plays an important role in controlling the efficiency of a sunlight-driven cycle of reactions that continuously generates ozone. When a hydroxyl radical and NO₂ collide, the molecules may form HONO₂ nitric acid as a stable by-product. Because of the stability of nitric acid, its formation locks up hydroxyl radicals and NO₂, and thereby prevents these molecules from contributing to ozone formation; this reaction thereby slows the formation of ozone. Until now the rate of reaction has been unclear because a less stable form of nitric acid (HOONO) may also be formed, and this molecule quickly breaks apart in the atmosphere, releasing the hydroxyl radical back into the atmosphere where it may once again become available to form ozone.

The team's experiments show that the stable form of nitric acid forms slower than previously believed. There is therefore more OH available in polluted, ground-level air for the formation of ozone than previously believed, and thus probably more ozone in the atmosphere than previously predicted. The research team concluded that relatively small changes in the rates and proportions of reactions forming unstable and stable nitric acid could lead to small but significant changes in ground-level ozone levels.

Source: Mollner et al., Rate of Gas Phase Association of Hydroxyl Radical and Nitrogen Dioxide, *Science*, (29 October 2010) 330 (6004), pp.646-649, doi: [10.1126/science.1193030](https://doi.org/10.1126/science.1193030).

Air Pollution Components in different Locations

Measurements of PM₁₀, PM_{2.5}, particle number concentrations (PNC), black carbon (BC), elemental composition of PM₁₀ and PM_{2.5} and NO_x were conducted simultaneously in eight major streets and nine (sub)urban background locations in the Netherlands.

The contrast between busy streets and urban background in NO₂ was less than the contrast found for BC, PNC and elements indicative of non-exhaust emissions, adding evidence that NO₂ is not representing (current) traffic well. The study supports a substantial role for non-exhaust emissions including brake- and tyre wear and road dust in addition to direct combustion emissions. Significant

underestimation of disease burden may occur when relying too much on the regulated components, including NO₂, the authors say.

Source: Boogard et al., Contrast in air pollution components between major streets and background locations: particulate matter mass, black carbon, elemental composition, nitrogen oxide and ultrafine particle number; *Atmospheric Environment* (2010), doi: [10.1016/j.atmosenv.2010.10.033](https://doi.org/10.1016/j.atmosenv.2010.10.033).

Effect of DOCs and DPFs on NO₂ and Ozone Levels

This study considers potential impacts of increased use of diesel oxidation catalysts (DOCs) and catalysed diesel particulate filters (DPFs) on ozone formation in the Dallas/Fort Worth (DFW) area. It notes that there is concern that excess NO₂ emissions from vehicles equipped with these devices could increase ambient ozone levels.

In a scenario with 'maximum penetration' of DOC/DPF devices in a 2009 fleet of heavy-duty on-road trucks, school buses, and construction equipment the authors showed an overall reduction in oxides of nitrogen (NO_x) because of the accelerated turnover of equipment to cleaner models, resulted in a net decrease in daily maximum 8-hr ozone of 4-5 ppb despite an increase in NO₂ emissions. The researchers concluded that there are noticeable decreases in ozone for the maximum penetration scenario because NO_x associated with DOC/DPFs (i.e., accelerated fleet turnover) exert more influence than excess NO₂.

Source: Bar-Ilan et al., Potential Ozone Impacts of Excess NO₂ Emissions from Diesel Particulate Filters for On- and Off-Road Diesel Engines; *Journal of the Air & Waste Management Association*, 2010, 60 (8), pp.977-992.

Characterisation of Particulate

DG-JRC Paper on PMP Volatile Particle Removal

A new paper from researchers at the Commission's Joint research Centre (DG-JRC) reports on an investigation of the PMP protocol's removal efficiency for volatile species using two Euro 3 diesel light-duty vehicles, a Euro 2 moped, and a Euro III heavy-duty vehicle. The results showed that the condensed material in the accumulation mode (approx. 50-500 nm) was removed with an efficiency of 50-90%. The researchers concluded the nucleation mode was also completely evaporated or was decreased to sizes <23 nm; thus these particles would not be counted, indicating the robustness of the protocol.

Source: Giechaskiel et al, Evaluation of the particle measurement programme (PMP) protocol to remove the vehicles' exhaust aerosol volatile phase; *Science of the Total Environment*, (2010) 408 (21), pp.5106-16), doi: [10.1016/j.scitotenv.2010.07.010](https://doi.org/10.1016/j.scitotenv.2010.07.010).

Evaluation of Denuder and Catalytic Stripper

The objective of this study was to compare two methods that are used to separate the solid and

volatile components of an aerosol: the thermal denuder (TD) and catalytic stripper (CS).

The authors challenged both systems with atmospheric and laboratory generated aerosols, the latter composed of tetracosane, tetracosane and sulfuric acid, and dioctyl sebacate and sulfuric acid. These compositions were chosen because they roughly simulate the composition of nanoparticles found in Diesel exhaust.

The authors report that the thermal denuder method produced semi-volatile particle artefacts due to the incomplete removal of evaporated compounds that nucleated and formed particles, and solid particle artefacts that formed during treatment of the aerosol by the thermal denuder. Their results suggest, they say, that the differences in these methods will lead to different conclusions regarding the presence or absence, size, and concentration of solid particles in Diesel exhaust.

Source: Swanson and Kittelson, Evaluation of thermal denuder and catalytic stripper methods for solid particle measurements; *Aerosol Science*, doi: [10.1016/j.jaerosci.2010.09.003](https://doi.org/10.1016/j.jaerosci.2010.09.003).

Effects of Aftertreatment on Particulate Mutagenicity

A study was conducted to investigate the effects of operating conditions and exhaust aftertreatments on the mutagenicity of diesel particulate matter (DPM). The tests used a naturally aspirated mechanically controlled engine equipped with either a standard muffler, a diesel oxidation catalyst, two types of uncatalsed diesel particulate filter systems, and three types of disposable diesel particulate filter elements. Bacterial gene mutation activity of DPM was tested on acetone extracts using the Ames Salmonella assay.

The results indicated strong correlation between engine operating conditions and mutagenic activity of DPM. When the engine was fitted with the muffler, the mutagenic activity was observed for the samples collected from light-load, but not heavy-load operating conditions. When the engine was equipped with a diesel oxidation catalyst, the samples did not exhibit mutagenic activity for any of four engine operating conditions. Mutagenic activity was observed for the samples collected when the engine was retrofitted with three types of disposable filters and sintered metal diesel particulate filter and operated at light load conditions. The researchers concluded, however, that those filtration systems substantially reduced the concentration-normalised mutagenic activity from the levels observed for the muffler.

Source: Shi, Keane, Ong and Bugarski, Mutagenicity of diesel exhaust particles from an engine with differing exhaust after treatments; *Journal of Toxicology and Environmental Health Part A*, (2010), 73 (19), pp.1314-24, doi: [10.1080/15287394.2010.485030](https://doi.org/10.1080/15287394.2010.485030).

Engine Development and Emissions Measurement

Reactive Oxygen Species from Retrofit Technologies

This paper assesses the contribution of water-soluble transition metals to the reactive oxygen species (ROS) activity of diesel exhaust particles from four heavy-duty vehicles in five retrofitted configurations (V-SCRT, Z-SCRT, DPX, hybrid, and school bus).

The study demonstrates that despite an increase in the intrinsic ROS activity (per mass basis) of exhaust PM with use of most control technologies, the overall ROS activity (expressed per km or per hr) was substantially reduced for retrofitted configurations compared to the baseline vehicle.

Source: Verma, Shafer, Schauer and Sioutas, Contribution of transition metals in the reactive oxygen species activity of PM emissions from retrofitted heavy-duty vehicles; *Atmospheric Environment*, doi: [10.1016/j.atmosenv.2010.08.052](https://doi.org/10.1016/j.atmosenv.2010.08.052).

Californian Paper on PMP

Enhanced measurements of the influence of vehicle conditioning prior to testing on PM mass and solid particle number results are reported in a further paper resulting from the California Air Resources Board's participation in the UN-GRPE Particulates Measurement Programme (PMP).

The researchers say that the influence of vehicle preconditioning on particle number results was significant for both the European and USA test driving cycles. However, the trends for the cycles were opposite with one cycle showing an increase and the other cycle showing a decrease in particle number emissions. They conclude that continuous measurements of particle number concentrations have given insight into PM generation, but a greater understanding of the quality and errors associated with measurement technologies is advisable.

Source: Zhang, Collins, Huai, Herner and Chau, A study of emissions from a Euro 4 light duty diesel vehicle with the European particulate measurement programme; *Atmospheric Environment* (2010), 44 (29), pp.3469-3476, doi: [10.1016/j.atmosenv.2010.06.028](https://doi.org/10.1016/j.atmosenv.2010.06.028).

Sizes and PAH Distribution of Motorcycle Particulate

This study was undertaken to determine the size distribution, concentration, species, and carcinogenic potency of particulate matter and particle-bound polycyclic aromatic hydrocarbons (PAHs) emitted from a 4-stroke motorcycle at various speeds.

The particle total number concentrations (TNCs) emitted increased at elevated speeds. Most of the particles emitted at 30 km/h had diameters of less than 0.65 µm and contained higher percentages of total PAHs. The nanoscale-sized particulates emitted from the 4-stroke motorcycle at higher speeds had the strongest PAH-related carcinogenic potencies.

Source: Chien and Huang, Sizes and polycyclic aromatic hydrocarbon composition distributions of nano, ultrafine, fine, and coarse particulates emitted from a four-stroke motorcycle; *Journal of Environmental Science and Health. Part A, Toxic/hazardous Substances & Environmental Engineering* (2010) 45 (13) pp.1768-1774.

Effect of Hydrogen and Reformate on NO₂/NO_x Ratios

In this work the authors examined the influence of using hydrogen (H₂) and simulated reformat (H₂, CO and EGR gases) as a supplement to diesel fuel on NO₂ production for optimum operation of aftertreatment systems. They found that effects of adding H₂ or reformat results in a significant decrease in total engine-out NO_x emissions, as well as an increase in both NO₂ concentration and NO₂/NO_x ratio. The influence of the simulated reformat combustion on the NO₂ production is dependent on the engine load and in-cylinder conditions. It was observed that both reformat composition and concentration significantly influence the NO₂/NO_x ratio of the exhaust gas.

Source: Chong, Tsolakis, Gill, Theinnoi and Golunski, Enhancing the NO₂/NO_x ratio in compression ignition engines by hydrogen and reformat combustion, for improved aftertreatment performance; *International Journal of Hydrogen Energy* (2010), 35 (16), pp.8723-8732, doi: [10.1016/j.ijhydene.2010.06.008](https://doi.org/10.1016/j.ijhydene.2010.06.008).

Climate Change and Emissions

Benefits of combining Climate, Air & Energy Policies

Policies based on cost-benefit analysis that tackle climate change, air pollution and energy security together produce far greater benefits than policies designed to address these issues separately, according to a new study.

The study says that current oil reserves would last until much longer than currently predicted and the number of premature deaths due to air pollution would be reduced by some 3 million per year globally, if all three policy areas were combined.

Source: Bollen, Hers, and van der Zwaan, An integrated assessment of climate change, air pollution, and energy security policy. *Energy Policy* (2010), 38, pp.4021-4030, doi: [10.1016/j.enpol.2010.03.026](https://doi.org/10.1016/j.enpol.2010.03.026).

FORTHCOMING CONFERENCES

8th International Conference – Powertrain Technologies for CO₂ Reduction

17-18 November 2010, Turin, Italy

Details at www.ata.it/en/convegni/calendario/futuri

The ATA 2010 Powertrain Technologies Conference aims to provide a forum where participants discuss the development of advanced combustion concepts and hybrid-electric technologies, the potential for bio-fuels and natural gas and the basic technologies for electric vehicles.

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 processes, fuels, lubricants and friction and alternative propulsion.

Euro Oil & Fuel 2010:

Bio-components in Diesel Fuels – Impact on Emissions and Ageing of Engine Oil

24-26 November 2010, Cracow, Poland

Details at www.inig.pl/EuroOilFuel2010

Sessions include European development trends of diesel fuels containing bio-components, impact of bio-components on emissions of diesel engines and field experiences concerning bio-components in diesel fuel.

Congress on Electric and Hybrid Vehicles

25-26 November 2010, Paris, France

Details at <http://www.congres-cesa.com>

The congress will offer a comprehensive overview of technologies and societal initiatives that will shape the future and create new markets. It will communicate the actions taken by all actors in the "Platform of the automotive industry".

Emissions Control Concepts

29 Nov. – 1 Dec. 2010, Wiesbaden, Germany

Details at www.emission-control-concept.com/PM

IQPC is providing a forum to discuss international emissions legislation and evaluate its impacts on the automotive industry. Key speakers will share their knowledge on advanced aftertreatment systems and present their experiences in customised product development.

Monitoring Ambient Air 2010: New Air Quality Measurement Technologies

14-15 December 2010, London, UK

Details at www.aamg-rsc.org

This meeting will focus on new measurement challenges, including new technologies for air pollution measurement, small sensors, real-time measurement of PM components or properties, improved measurement of organic particles and gases, and measurements for source apportionment.

Spark Ignition Engine Combustion Short Course

17-21 January 2011, Leeds, UK

This course provides a fundamental understanding of the combustion processes associated with Spark Ignition Engine design including future concepts.

Symposium on International Automotive Technology 2011

19-21 January 2011, Pune, India

Details at <http://siat.araiindia.com>

The theme of SIAT 2011 is Sustainable Mobility - A Creative Challenge. The symposium will focus on a number of areas including alternate fuels, future engine technologies, emissions, and ELV regulations.

ACEM Conference

26 January 2011, Brussels, Belgium

Details will be at www.acem.eu

Diesel Emissions Conference and AdBlue Forum Asia 2011

22-24 February 2011, Beijing, China

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

The event will provide legislative updates, case studies, technology assessments, market insights and forecasts from industry experts.

International Advanced Mobility Forum

8-9 March 2011, Geneva, Switzerland

Details at www.iamf.ch/en/presentation/index.php?idContent=160&naviqlid=30

12th European Fuels Conference

8-11 March 2011, Paris, France

Details at www.wraconferences.com/2/4/articles/205.php

The conference will focus on reviewing refiners and manufacturers' strategy for each renewable energy foreseen to be used in transport between 2010-2020, as well as the contributions from the transport sectors to the 10% target and how biofuels and road transport will contribute to that overall target.

17th Annual Fuels & Lubes Asia Conference

9-11 March 2011, Singapore

Details at www.fuelsandlubes.com/callForPapers

8th Green Ship Technology Conference and Exhibition

21-22 March 2011, Oslo, Norway

Details at www.greenshiptechnology.com

The technical programme will feature high quality papers which will draw on the experiences of leading projects to showcase new innovations in technology as well as address some of the hottest issues currently impacting the maritime industry.

Diesel Emissions Conference 2011 Brazil

5-7 April 2011, Sao Paulo, Brazil

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

In a range of sessions discussing issues for heavy-duty/on-road trucks there will be help from the

legislators in understanding new emissions legislation and information on new technologies.

2011 SAE World Congress

12-14 April 2011, Detroit, Michigan, USA

Details at www.sae.org/congress

32nd Vienna Motor Symposium

5-6 May 2011, Vienna, Austria

2011 JSAE Annual Spring Congress & Exposition

18-20 May 2011, Yokohama, Japan

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

Deadline for abstracts 17 December 2010

6th AVL International 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 compliance for engines of 50 to 500 hp. Electrification and hybrids will also be addressed.

Diesel Emissions Conference & AdBlue Forum Europe 2011

14-16 June 2011, Germany

Details will be at www.integer-research.com/conferences

15th ETH Conference on Combustion Generated Nanoparticles

26-29 June 2011, Zürich, Switzerland

SAE Powertrains, Fuels and Lubricants

30 August – 2 September 2011, Kyoto, Japan

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

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

7-8 September 2011, New Delhi, India

Details will be at www.integer-research.com/conferences

SAE 2011 Small Engine Technology Conference

8-10 November 2011, Sapporo, Japan

Details at www.setc-jsae.com

Abstracts due 28 January 2011

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.