

# AIR QUALITY

April 2009 Issue 36

BULLETIN

## NATIONAL POLICY

# First look at NO<sub>2</sub> plans

Defra has unveiled to the Air Quality Forum its early thoughts on what it plans to do about excess NO<sub>2</sub>.

The UK, like most European countries, will not meet European NO<sub>2</sub> objectives and next year it must either comply, or submit an action plan to qualify for a five year extension. A similar process was followed for PM<sub>10</sub> (*AQB Feb 2009 p1*).

Whereas only one zone is expected to exceed for PM<sub>10</sub>, NO<sub>2</sub> exceedences are far more widespread. Indeed if the UK is ranked according to percentage of zones exceeding, it is the worst in Europe. Maps of exceedences have been extracted from Defra under freedom of information laws by the Campaign for Clean Air in London (CCAL) (*see p2*).

For the PM<sub>10</sub> extension, Defra's submission to Europe consisted of a justification for doing nothing. It will be harder to argue away the NO<sub>2</sub>

exceedences and early Defra plans suggest that many actions discarded in the 2007 national air quality strategy will have to be revisited. Even then, NO<sub>2</sub> may still not meet limits in 2015, five years later than the original 2010 deadline.

Simon Birkett of CCAL said: "The UK is already on the receiving end of legal action from the European Commission for PM<sub>10</sub>. Failure to tackle NO<sub>2</sub> dwarfs its failures on particles."

"The UK seems to be accepting the inevitability of infringement action on Article 22(3) while making no urgent effort to comply with it. It is astonishing that the government intends to spend the next 18 months to two years debating plans and programmes to include a time extension application for NO<sub>2</sub> – when it admits it already expects the UK to fail to meet at least one of the three requirements for such a time extension in London from January 2010. Instead it

should be working out now how to comply with the laws as soon as possible after 1 January 2010.

"No public consultation is currently planned on NO<sub>2</sub> until November/December 2009. The submission of an exemption on NO<sub>2</sub> to the Commission is then planned for Sept 2010 which means, with nine months for the Commission to object, it could be June 2011 before we know that a plan is approved!"

Birkett points to Germany, which is considering inner city low emission zones in 40 cities by the end of 2009 to help it comply with directive requirements (Birkett is lobbying hard for a London inner LEZ, *see news, p3*). Defra itself points out that the Netherlands has set aside up to €250 million to support local initiatives and has a combined budget of €2billion to support their application for a time extension for both PM<sub>10</sub> and NO<sub>2</sub>.

● Continued page 2

## TRANSPORT POLICIES

# Action plans are not working, inquiry told

A transport expert claims that air quality management areas are not working.

Speaking to the London Assembly environment committee hearing on air quality, York University's John Whitelegg, a well known transport and environmental campaigner, was one of a number of witnesses called to the inquiry (*see also news, page 3*). He told the committee: "There needs to be a health-based approach to air quality

that contains very strong legal restrictions along the lines of 'thou shalt eliminate PM<sub>2.5</sub> by 2010 or thou shalt be in big trouble.'

"At the moment a lot of air quality stuff gets lost in a big sticky treacle as our air quality strategy as a whole in Britain lacks monitoring, lacks quality control and a clear relationship between input and output."

Whitelegg continued: "I've looked at over 100 action plans and very few if any of them are

working or delivering the results and nothing is done. You can have air quality action plans guaranteed to have no action in them, guaranteed no results, tick the boxes, job done, that's it, lets more on and deal with waste and recycling.

"They don't work because no one is going round with a big stick with a nail on the end of it making sure they work."

● The meeting can be viewed via webcast: [www.london.gov.uk/assembly/webcasts.jsp](http://www.london.gov.uk/assembly/webcasts.jsp)

## IN BRIEF

### SupportingU wins London contract

Monitor support firm SupportingU has won a key contract to maintain and service air quality monitors. The contract was formerly held by Casella.

The three year contract was awarded by Kings College London ERG which runs the London Air Quality Network (LAQN).

Dave Green of ERG says: "SupportingU is a specialist service support company that has been working on the LAQN for several years. It has demonstrated an ability to respond quickly and efficiently to callouts. I look forward to working with them to continue to provide the level of service and maintenance local authorities expect."

"We have been working with our current contractor, Casella ETI, on the LAQN since its inception and will continue to work with them at sites where they hold contracts directly with the local authority. They have provided an excellent service over many years."

● Website [www.supportingu.co.uk](http://www.supportingu.co.uk)

### Indicator change

National indicators have been tweaked.

NI 194: (Air quality – percentage reduction in NO<sub>x</sub> and primary PM<sub>10</sub> emissions through local authority's estate and operations) has been changed to run to coincide with the financial year rather than the calendar year.

● Updated definitions can be seen on [www.communities.gov.uk/publications/localgovernment/updateddefinitions](http://www.communities.gov.uk/publications/localgovernment/updateddefinitions)

### Office closed

*Air Quality Bulletin's* offices are closed 1st-14th April.

The best way to contact during this period is by email [jackpease@empublishing.org.uk](mailto:jackpease@empublishing.org.uk) or tel 07787 500901

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## OPINION

*It's been fashionable in recent years to think of regulation as a dirty word. But one only needs to see where the 'bonfire of regulation' has got us in the banking industry.*

*Attempting to clean up air quality may seem too expensive to contemplate in a credit crunch but may well prove a cost effective way of stimulating the economy and tackling environmental and health issues at the same time.*

*It would certainly seem more cost beneficial than subsidising bankers' pensions, or indiscriminate schemes to encourage the motor industry to build cars that nobody wants.*

*Some years back AQB criticised Europe for allowing a derogation for air quality objectives, now we take it all back. The requirement to set out plans and programmes as a condition of the derogation appears to have forced Defra civil servants (finally) to tell the truth to its ministers – ie that something needs to be done.*

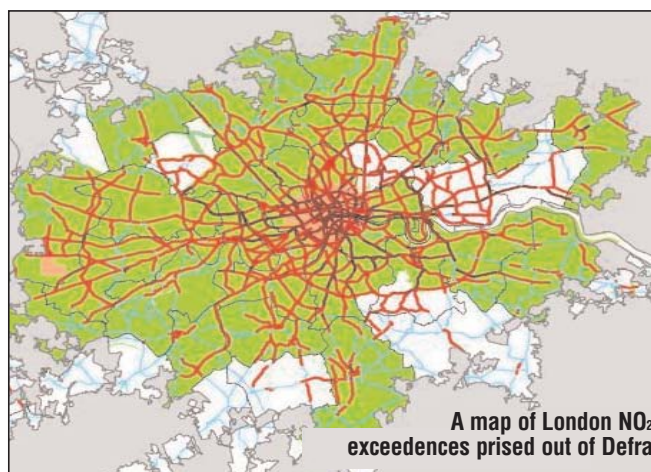
## NATIONAL POLICY

# NO<sub>2</sub> action: (continued from page one)

Defra's draft plans (required by Europe if a state is asking for an exemption) differentiates zones depending on what is the predominant reason for failing, eg HGVs, background or general sources. Defra's plan then discusses tailored action to tackle each of these types of problems and comments:

"Numerous locations (most notably large urban centres, and Greater London), are projected to exceed the limit value by a substantial extent. Both the level of exceedence, and the source apportionment will make meeting the NO<sub>2</sub> limit value challenging, and will require a well co-ordinated and holistic approach across local and national Government. It may be that creative measures will be needed if all locations are to meet the limit value by 2015.

"In order to meet the limit value and to realise further health benefits we must consider measures that not only tackle roadside emissions but might also contribute to reducing background levels of



NO<sub>2</sub> and thus concentrations overall and particularly at roadside.

"For some parts of the UK exceedences are relatively close to the limit value and here compliance might be achieved by targeted regional measures taking into account the most significant sources of NO<sub>2</sub> in the locality. In other cases (for example, in London and some of the bigger urban areas) the analysis suggests that the scale of exceedences is such that if regional measures alone were pursued these would have to be significant and might be difficult to achieve without concerted effort.

"The most realistic approach might therefore be a combination of both national and well targeted local/regional measures taking into account source apportionment characteristics and other considerations for particular regions.

"Even here, radical measures such as significantly accelerating improvements in vehicle emission standards or pushing forward new drive systems such as gas driven buses or electric vehicle initiatives are likely to be needed and to be successful would need significant Government impetus."

The air quality strategy whittled down proposed action to three actions involving cleaner vehicle incentives and reducing shipping emissions with other options dismissed as not cost effective (*AQB Aug 2007 p1*).

Now, Defra says: "In order to

achieve the level of reduction projected for 2020 by 2015 (i.e. five years earlier than envisaged) and to meet the limit value across the UK it would not only be necessary to implement all the three measures as a minimum but also to significantly ratchet up any delivery mechanisms (such as incentives) to encourage the uptake by 2015.

"Furthermore, even if UK were to implement the three new measures identified by the strategy on their own, these would not eliminate all exceedences in the UK and a number of urban areas, especially in London, would continue to have exceedences towards 2020. Therefore in order to have any confidence of meeting the limit value across the whole of the UK by 2015 it will be necessary to revisit the other measures in the strategy that were to be kept under review and even those other measures in the strategy which were rejected at the time as not being cost beneficial or considered less feasible.

"Moreover some of these options might have to be implemented on a radical scale to achieve the necessary reductions. For example large scale retrofitting of pre Euro 5 and 6 vehicles to reduce emissions; significant support to electric vehicle programmes; and extensive introduction of hybrid/gas fuelled vehicles for captive fleets would need to be given serious consideration in order to present a credible case to have our limit value deadline extended to 2015."

## THE EUROPEAN NO<sub>2</sub> NAUGHTY BOYS LEAGUE

Zones currently exceeding the NO<sub>2</sub> yearly limit value (expressed as a percentage of the total zones in each country), and the road transport emissions of NO<sub>x</sub> per capita

Country	Zones exceeding	Population people/km <sup>2</sup>
United Kingdom	95%	249
Austria	82%	99
Greece	75%	84
Germany	52%	231
Latvia	50%	36
Malta	50%	1282
Sweden	50%	20
Czech Republic	47%	130
Italy	42%	195
Belgium	36%	344
Denmark	33%	126
France	21%	100
Hungary	18%	108
Bulgaria	17%	70
Spain	14%	86
Portugal	12%	115
Romania	10%	91
Slovakia	10%	110
Finland	7%	16
Poland	4%	122
Cyprus	0%	83
Estonia	0%	30
Ireland	0%	60
Lithuania	0%	52
Slovenia	0%	99
Netherlands	Not available	393

## LONDON

# London Assembly probes air

The London Assembly Environment Committee has held two hearings as part of its air quality probe. Findings will feed in to a revamp of the London Mayor's air quality strategy which is due to be released in draft form this summer.

As well as the London strategy rewrite, air quality in London is in the news because of the postponement of the third phase of the low emission zone (*AQB February p9*) and pressure from the increasingly high profile Simon Birkett of the Campaign for Clean Air in London (*see news p1/3*).

The assembly's second hearing brought together witnesses including Isabel Dedring, GLA director of environment, Peter Daw, GLA strategy manager – air quality, energy, and climate change, Martin Williams, Defra air quality boss, John Whitelegg, Stockholm Environment Institute, University of York, Nick Fairholme, TfL's head of LEZ, Charles Buckingham, TfL's impacts monitoring manager, Ruth Calderwood, City of London and Mike LeRoy of Westminster.

LEZ boss Nick Fairholme was quizzed on the nature of advice given to mayor Boris Johnson before he decided to postpone stage three of the LEZ (which would have extended controls to small commercials). The committee produced tables published two years ago that showed that the third phase

would cut air pollution above limits for 107,000 people.

Fairholme implied that this information was not given to Boris Johnson, saying "it wasn't as simple as that" and the impacts couldn't be easily disaggregated. GLA environment boss Isabel Dedring stepped in to point out that phase three had been suspended and not withdrawn: "This really is a suspension," she emphasised.

Defra's Martin Williams was asked why, given that the standards have been known about for years, something hasn't been done to ensure they were met: "If we knew then what we know now, we may have come to a different conclusion on the limits." He added that the US NO<sub>2</sub> limit was 100µg/m<sup>3</sup> as opposed Europe's 40µg/m<sup>3</sup>.

The committee asked whether Williams was implying that the standards were wrong, which Williams denied. The committee pointed out that there was research to suggest that even stricter targets were needed to protect human health.

Meanwhile Darren Johnson, chair of the environment committee, said: "Not taking action on air quality because of costs is unacceptable – this is about saving lives and making London a healthier and cleaner place to live in."

"We look forward to the Mayor's air quality strategy in the summer providing a detailed programme of how London will

meet the EU's health-based targets."

The London Assembly has been critical of the decision to postpone the low emission zone, Darren Johnson added: "Air pollution continues to be a really serious problem for London, causing 1,000 premature deaths every year. We were very surprised that rather than announcing much-needed additional measures to tackle this problem, the Mayor made a reckless and irresponsible decision to backtrack on the plans."

"Not only is he playing with the health of Londoners, but he is also undermining the government's case to the EU that it is taking air quality seriously in a bid to avoid a £300m fine."

Another committee member said: "Air pollution causes almost five times the number of fatalities as road accidents, so it beggars belief that air quality is not given higher priority. Boris Johnson must take his public health responsibilities seriously and reinstate the third phase of the low emission zone."

Separately Lacors added its voice to the disapprovals: "The proposal to scrap phase three of the low emission zone is also being felt in Yorkshire with one authority stating that planning officers were now less likely to accept similar schemes on the grounds of the economic impact to local businesses. Our feeling is that good work to date is starting to be undermined."

## IN BRIEF

## Dixon departs

Janet Dixon is to leave Defra after nearly 13 years in the air quality division.

Dixon is in charge of science for air quality and most recently has been responsible for implementing the new monitor network required by the latest European directive. She is moving to chemical, biological, radioactive, nuclear (CBRN) emergencies research in the CN (chemicals and nanotechnology) programme within Defra.

## Muir moves on

Bristol City Council's David Muir will shortly leave the council. From 31st May he can be contacted on 0117 979 1688 email [Muirenvironment@aol.com](mailto:Muirenvironment@aol.com)

## How to fix FDMSs

AEA has released a manual on how to maintain Teom FDMS particle monitors correctly. It uses pictures and diagrams to show how the new generation of particle monitors can be kept running correctly.

● *Site operational procedures for Teom FDMS analysers* can be viewed on the reports section of [www.airquality.co.uk/archive/reports/list.php](http://www.airquality.co.uk/archive/reports/list.php)

## London poll

The London Assembly's Environment Committee (LAEC) is currently conducting a public opinion poll on air quality.

The committee is seeking opinions on air quality near where people live, work and play and whether health has been affected by air pollution. The deadline is the 6th April.

● <http://tiny.cc/zCLyK> or email [david.bellman@london.gov.uk](mailto:david.bellman@london.gov.uk)

## Teom discontinued

Thermo has announced discontinuation of the Teom 1400ab particulate monitor.

Orders will be accepted until September and equipment will be supported for a further ten years.

● [www.thermo.com/com/cda/product/detail/1,10122682,00.html](http://www.thermo.com/com/cda/product/detail/1,10122682,00.html)

## STATISTICS

# How clean is Europe? New reports

Two reports have been released by the European Environment Agency (EEA) on Europe's air quality.

It notes one in four Europeans suffered frequent and high concentrations of PM<sub>10</sub> in 2005, according to the EEA technical report *Spatial assessment of PM<sub>10</sub> and ozone concentrations in Europe (2005)*. In addition to these daily peaks above EU thresholds, one in ten Europeans was exposed throughout the year to PM<sub>10</sub> levels higher than the annual mean limit.

Across the EU, PM<sub>10</sub> is estimated to have caused approximately 373,000 premature deaths in 2005.

The report records similar findings for ground-level ozone, with more than a third of the European population exposed to ozone levels higher than the EU's target value.

Health impacts of ozone appear to be lower than those of PM<sub>10</sub>, ranging from 75 premature deaths per million inhabitants (for south-eastern and southern Europe) to less

than 10 per million (northern and north-western Europe) in 2005.

The second technical report *Air pollution by ozone across Europe during summer 2008* suggests that, by several measures, ozone levels during last summer were the lowest since Europe-wide reporting began in 1997. Nevertheless, all EU member states and eight other European countries exceeded the long-term objectives set by EU legislation.

● [www.eea.europa.eu](http://www.eea.europa.eu)

## IN BRIEF

### All Coventry declared

All of Coventry has been declared an AQMA for NO<sub>2</sub>.

The decision was made to avoid smaller declarations which might cause planning blight and reduce future assessments to decide whether areas need to be increased.

Meanwhile Kathryn Bell has left Coventry City Council as part of a reorganisation that seek air quality and contaminated land officers combining roles.

### Quantitech: extra PhD

Quantitech, the Milton Keynes based supplier of environmental monitoring instrumentation has added yet another member of staff bearing doctoral qualifications.

Within the last year, the company has recruited Dr Andrew Hobson to provide technical support for gas monitoring equipment, Dr Gareth Pearson for laboratory analysis support and Dr Roberto Lopez-Garcia has now joined the company's service department.

● [www.quantitech.co.uk](http://www.quantitech.co.uk)

### New London monitors

The London Borough of Hounslow has recently added two sites to the London air quality network.

Hounslow 6 (Heston Road) is a roadside site positioned on the north side of the busy A4 West road. Hounslow 7 (Hatton Cross) is a background site just south of the A30 near Hatton Cross. Both sites are situated in residential streets and are comprised of a NO<sub>x</sub> analyser and a Teom measuring PM<sub>10</sub>. Although Hounslow 7 falls into the background category, it is a short distance from the perimeter of Heathrow Airport and almost underneath the flight path.

### Table topsy turvy

We accidentally transposed the tables on p9 of last months feature on new technical guidance, we correctly said there were optimistic NO<sub>2</sub> falls but the mixed up the table illustrating the falls.

## HEALTH

# Strategy set for child health

The Health Protection Agency has finalised its children's environment and health strategy. It consulted on a draft last year (*AQB April p7*).

The strategy provides a brief overview of children's health in relation to their environment in the UK and makes recommendations on action to meet the UK's commitment to the WHO's CEHAPE (Children's Environment and Health Action Plan for Europe). HPA says: "Children and young people can be more susceptible to the effects of poor air quality, both indoors and outdoors, as their lungs are still developing and

they take in proportionately more air than adults."

A number of areas are highlighted for improvement including local air quality management guidance: "Action plans should be extended to include measures which can be taken to reduce the exposure of susceptible groups, including children.

"Outdoor air quality policy and legislation focuses on achieving health-based air quality objectives in all areas where people are exposed. Action plans developed by local authorities could prioritise more susceptible groups, including

children, within the general population, and guidance could be provided on what actions are practical and effective."

HPA highlighted examples of suggested interventions such as the London low emission zone. Other actions including planning new schools, childcare facilities and play areas which should include an assessment of air quality, and implementation of the exposure reduction framework for particles.

● *A children's environment and health strategy for UK*  
[www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1204707136075](http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1204707136075)

## REGULATION

# Agency set to police aviation emissions

More details have emerged on the plans to have the Environment Agency regulating the aviation industry emission trading scheme. But as yet no further details have emerged on how the Agency will ensure Heathrow expansion complies with air quality limits (*AQB February p5*).

The EU emissions trading scheme – which caps net CO<sub>2</sub> emissions from aviation at average 2004-06 levels – will come into force for flights

arriving and departing EU airports from 2012. The scheme, which already applies to many ground-based industries, means that businesses must buy allowances from other sectors to cover any emissions above their allotted cap.

As regulator of the scheme, the Environment Agency will check that operators monitor their emissions in the lead-up to the start of the scheme and will be tasked with ensuring that operators comply with the

requirements of the scheme. The Environment Agency will have the power to issue fines to operators who do not comply with the scheme and will be supported by advice from the Civil Aviation Authority.

A ten week consultation includes some detail on how the regulation regime will work (and may shed light on how air quality regulation may work).

● [www.decc.gov.uk/en/content/cms/consultations/consultations.aspx](http://www.decc.gov.uk/en/content/cms/consultations/consultations.aspx)

## PLANNING ACT

# Pitt lined up for planning commission chair

Sir Michael Pitt is lined up to chair the Infrastructure Planning Commission. The Commission is being created as part of the Planning Act shake-up that will see major projects decided by the Commission rather than public inquiries.

Policy will be set through a series of National Planning Statements which are currently being prepared to cover large projects such as power stations. Bodies such as Epuk have expressed fears that the Act will prevent nuisance actions being taken against large developments such as wind farms (*AQB Oct 2008 p6*).

As so little is known about the workings of the new planning system, Pitt's grilling provided considerable insight into the future. A panel of

commissioners will review larger projects, while smaller projects will be decided by one commissioner.

Part of the Planning Act requires the developer to carry out consultation before applying to the Commission. Pitt said: "Applicants aren't used to consultation. I would advise applicants to turn to the local authority itself and ask them what form the consultation and public engagement should take. The Commission can refuse to accept an application from any promoter that has not properly consulted on the proposal."

The Commission can impose conditions. Pitt explained: "Approvals are not just a binary yes/no. The Commission has big role in ensuring that mitigating factors that minimise

the environmental and other impacts on the locality of a new development be minimised as far as possible. I think that one of the areas that we can add a lot of value is through conditions which are well thought-through and quite challenging on what they demand of the applicant."

The IPC will not have a role in monitoring those conditions: "Our experience is that they are very often forgotten and not properly monitored. It will be important for IPC to have confidence that they are being monitored, we will need feedback on success and failures of conditions."

● Pitt's grilling can be viewed on [www.parliamentlive.tv/Main/VideoPlayer.aspx?meetingId=3695](http://www.parliamentlive.tv/Main/VideoPlayer.aspx?meetingId=3695)

## PLANNING

# Dundee biomass plant allowed

Scottish Government has overruled Dundee City Council on biomass.

Dundee had originally turned down a plant at the Hillcrest commercial development on the grounds that a proposed wood burning boiler could worsen particle emissions. The developer appealed to the Scottish Government which overruled Dundee.

Dundee and Edinburgh have been at the forefront of efforts to ensure that the dash for “carbon neutral” biomass plants – encouraged by forestry interests – did not trample over air quality concerns (*AQB December 2008 p1*). The two councils say that they are under a duty to reduce particles and that biomass risks worsening exposure in air quality management areas.

A Scottish Government-commissioned report showed that there was an impact, but not as much as an earlier report for London Councils had suggested.

The Hillcrest development is

the first major biomass plant issue to be tested by the appeals process in this way, and suggests that global warming pressures can override air quality concerns. However the appeal places eleven tight conditions on the development (see below).

The judgement notes: “The main area of dispute relates to air quality and arises from the effects that the emissions from the biomass boiler may have on local residents and the nearby nursery. Using the updated good practice guidance (*Development control: Planning for air quality*) produced by Epuk in 2006, the council indicated that the 2007 study showed that the increase in the maximum annual mean ground level concentration for PM<sub>10</sub> would be 5.8%, which is described as a ‘small’ magnitude of change.

“They also indicated that as the ambient level would be more than 75% of the 2010 objective for PM<sub>10</sub>, the impact would be described as ‘slight adverse.’ I do not agree that a

change or impact of this scale could be regarded as significant.”

The appeal inspector continued: “Concern was expressed about the cumulative adverse effects of such boilers. The evidence does not indicate that the proposed boiler, taken together with biomass facilities which exist, have planning permission or are the subject of valid, undetermined planning applications, would result in levels of emissions which could reasonably justify refusal.

“The council appeared more concerned about the possible combined effects of developing similar facilities at an unknown date in the future, of which no details are available. As this involves considerable uncertainty and speculation, it would be inappropriate to use it as a reason for preventing this facility from proceeding.”

● Hillcrest Group Appeal decision P/PPA/180/232 can be viewed on the website [www.dpea.scotland.gov.uk/casesearch.aspx](http://www.dpea.scotland.gov.uk/casesearch.aspx)

## Conditions attached to Dundee decision

The conditions attached to the appeal decision will be of interest to other local authorities and developers:

**Condition 9:** “The development shall not commence until full details of the biomass boiler to be used, including type, model, commissioning and operational details, and the associated abatement measures have been submitted to and approved in writing by the planning authority. The boiler shall be from the list of appliances which are exempt for use in smoke control areas. The details shall demonstrate that the levels of NO<sub>2</sub> and PM<sub>10</sub> recorded in the dispersion modelling results in the Bureau Veritas Report of January 2008 shall not be exceeded. They shall also demonstrate that the levels of NO<sub>2</sub> and PM<sub>10</sub> have been minimised through the use of best available technology, including abatement technology. The development shall then be completed in accordance with the approved details.

**Condition 10:** “The development shall not commence until full details of the maintenance of the boiler and the associated abatement technology and the arrangements for monitoring their performance have been submitted to and approved in writing by the

planning authority. The development shall then be maintained and monitored in accordance with the approved details.

**Condition 11:** The development shall not commence until full details of the wood fuel to be used, including type, source, delivery and storage arrangements, have been submitted to and approved in writing by the planning authority. The details shall provide an auditable scheme under *Solid Biofuels – Fuel Quality Assurance: DD CEN/TS 15234:2006* relating to the traceability, handling and quality of the wood fuel. The fuel quality shall be that required for condition (9) above. The details shall also provide a protocol which will allow a representative of the planning authority access to the fuel store to acquire a sample of fuel for analysis. Additionally, the details shall outline a scheme for minimising fugitive dust emissions from the delivery of fuel. The development shall then be carried out in accordance with the approved details.

**Condition refused:** “I do not consider that condition 1 of the latest supplementary list, which seeks to restrict emissions of PM<sub>10</sub> and PM<sub>2.5</sub> to a level no greater than that which would be generated by natural gas, to be necessary.

## IN BRIEF

### ARTEMIS concludes

TRL has published findings from the massive pan European ARTEMIS project.

ARTEMIS aimed to develop a harmonised emission model for road, rail, air and ship transport, and to provide consistent emission estimates at the national, international and regional levels. The project consortium was made up of 37 partners from 14 countries and was coordinated by TRL.

● *PPR350 ARTEMIS: Assessment and reliability of transport emission models and inventory systems – final report* [www.trl.co.uk](http://www.trl.co.uk)

### Highways plans

The Highways Agency has released its Business Plan for 2009/10.

On air quality, comments include: “We plan to develop three schemes in AQMAs that are likely to exceed an EU Directive limit value.” (word for word what was said last year). It adds: “We are liaising with Dutch counterparts on their air quality research programme to identify any mitigation measures developed as part of the research that would be suitable for use in the UK.”

● *Highways Agency’s business plan for 2009-10* [www.highways.gov.uk](http://www.highways.gov.uk)

### INSPIRE data deal

Defra has launched a public consultation on the INSPIRE Directive. The EU Directive will collate spatial, geographic and environmental data, currently held by numerous organisations, to provide a single access point to data.

The consultation seeks views on the way in which Defra will define ‘public authorities’, how the Directive may impact on individual rights, national security or the judicial system. The assessment shows that one-off costs of implementation over 10 years are estimated to be some £55-£60m for the UK. No extra funding is planned.

● [www.defra.gov.uk/corporate/consult/inspire/index.htm](http://www.defra.gov.uk/corporate/consult/inspire/index.htm)

## IN BRIEF

### Fees set for LAPC

Fees have been set for 2009/10 for local authority environmental regulation of industrial plant.

There will be some increases, reasons for the increases were set out in Defra's consultation last year (*AQB November 2008 p2*).

In summary the changes commencing April 2009 include:

- An across the board increase in fees and charges by on average 3.1%, taking account of inflation and efficiency savings with the exception of annual charges for high and low risk standard Part B processes and temporary permit transfers for mobile plant;
- Annual charges for high risk installations (2% of the total number of installations) increase by 4.2%, and by 2.8% for low risk installations (64% of the total). This achieves 3.1% overall but increases the incentive on higher risk operators to improve their performance;
- The extension of risk based regulation to the remaining regulated sectors not yet covered;
- A new charge of £74 for a change of ownership for low risk reduced fee activities to cover local authority costs in reviewing operator competence at that facility;
- The extension of the charging review to a bi-ennial rather than annual cycle.
- More details can be found on Defra's website [www.defra.gov.uk/environment/ppc/localauth/fees-risk/fees.htm](http://www.defra.gov.uk/environment/ppc/localauth/fees-risk/fees.htm)

### Risk extension

Risk-based regulation is being introduced for the following sectors from 1 April 2009:

- Small waste oil burners;
  - Gas odorisers;
  - Dry cleaners;
  - Vehicle refinishers;
  - Petrol stations;
- More details can be found on Defra's website [www.defra.gov.uk/environment/ppc/localauth/pubs/guidance/notes/aqnotes/index.htm](http://www.defra.gov.uk/environment/ppc/localauth/pubs/guidance/notes/aqnotes/index.htm)

## PM<sub>10</sub> DEROGATION

# Lacors responds to PM<sub>10</sub> plan

Lacors (The Local Authorities Coordinators of Regulatory Services) has criticised the consultation process for the draft UK notification to the European Commission to secure additional time to meet the limit values for PM<sub>10</sub> (*AQB February p1*).

Lacors' response suggests that its local authority members criticised the short period of consultation and felt that the accompanying technical report was difficult to read as it was "too vague" and the arguments were "not set out as logically or persuasively as they could have been".

"A longer consultation process and more local authority engagement prior to the issuing of the consultation would have helped as local authorities would then have had more notice of the issues and been aware of Defra's reasoning behind the assumptions made in the documents.

"The process of applying for the time extension appears to be time consuming and costly; those resources could have been better directed at addressing the problem of the non-compliance with the limit value instead." Lacors queries the premise that with the extended time most areas would meet the limit in light of the recent study by ERG which showed levels of PM<sub>10</sub> to be increasing at a rate of 0.5µg/m<sup>3</sup> per annum.

Lacors felt the report did not give an accurate picture of air quality. "Examples of this are that in Sheffield the council is looking to declare an air quality management area, (AQMA) for PM<sub>10</sub>, but that area is not flagged in the technical report. Also, in Birmingham, sections of road have been identified as likely to exceed but local network has shown compliance for the last 12 years.

"There is no AQMA declared in the Brighton/Worthing/Littlehampton zone which has been identified as an area likely to exceed in the technical report. In general there are too many inconsistencies between what local authorities were finding and reporting to Defra and the data being presented. These inconsistencies could undermine the notification to Europe.

"A further point is that UK air quality legislation is presumed to have been written in such a way that compliance with the UK legislation would show compliance with the directive, or that monitoring data for one could be used for the other.

"The fact that there have been corrections for sea salt and transboundary emissions on the automatic network data means that the data from local authorities and that from the corrected AURN data are no longer comparable. Annual reports from local authorities in London have consistently shown there to be a problem with PM<sub>10</sub> and the limit is unlikely to be met in 2011 but this has not been reflected in the draft notification to the Commission."

"The consultation document seems to be contradictory: one paragraph states that local authority measures through the action plan route are more important at dealing with the small areas of exceedences found by the national modelling; however, another paragraph seems to say that the impact of local measures is not relevant as they are very difficult to quantify in terms of their effect.

"Page 80 of the technical report states that the six kilometre road length found to be exceeding was 'well within the uncertainties of the model' but it was felt that this was not a reason to discount it; the uncertainties can go either way with the resulting figure either underestimating or over estimating the final road length. It could be misleading to assume the model had over estimated and so assume that no action should be taken.

"Finally, in the London area it was strongly felt that remodelling should be carried out with the assumption that phase three of the low emission zone does not go ahead, and that the western extension of the congestion charge area does not proceed. To wait for the outcome of the consultation process and then find that phase three does not go ahead would not give sufficient time for additional action to be taken in time to meet the 2011 deadline."

On proposed action, Lacors says: "It is disappointing that retrofitting was the only option put forward. Experience has shown it was not a good solution and therefore should be considered as a back up option only. Instead, there are a range of options including:

- Traffic reduction plans;
- Scrapping of older vehicles: it was felt in the current economic climate, there was a good economic argument for this;
- Extending the hybrid bus programme further;
- Financial incentives to people for getting rid of their car: a suggestion for London was for residents to receive money off a bicycle or a car club voucher when their residents parking permit was renewed;
- Consideration of the impact of freight travel and addressing this through alternative fuel such as CNG or LPG;
- Encouraging use of hybrid vehicles as they are associated with a reduction in non-exhaust PM<sub>10</sub> emissions too; and;
- Encouraging behavioural change through compulsory eco-driving for existing drivers recognising the financial gains for increased fuel economy.

"In general, the document seems to present the view that the UK was hoping for the best when it came to meeting the limit rather than providing constructive steps to address the potential exceedences. Without further proposals (to include additional options suggested above) this consultation will be a missed opportunity for steps to be taken that would not only reduce PM<sub>10</sub> emission but also PM<sub>2.5</sub> which would be beneficial for the future.

The argument that Marylebone Road had site specific characteristics that made it sufficiently different to other areas was not supported; it was felt that many streets had similar characteristics both in London and in other UK cities. It was felt that across London there was a problem with PM<sub>10</sub> that the document was not acknowledging and that unless further steps were taken, it was suggested that it was unlikely that the limit would be met by 2011.

- [www.lacors.gov.uk](http://www.lacors.gov.uk)

# Monitoring at Mcerts

We take a sneak preview at the two-yearly Mcerts monitoring conference and exhibition taking place later this month

**P**resentations at the Mcerts 2009 conference (29 and 30th April, at the Bretby Conference Centre near Burton on Trent) will focus on issues relating to the testing and monitoring of air quality in stack emissions, with particular emphasis on how operator self-monitoring (OSM) and Mcerts fit into the Environment Agency's *Better Regulation* agenda.

High profile speakers from the Environment Agency, NPL, UKAS and AEAT will speak on subjects including emissions trading, the Environment Agency's *Modern regulation* programme and its impact on monitoring, the role of Mcerts in delivering the programme and how, in 2010, *EN14181 – Quality Assurance for an automated monitoring system*, will operate under UKAS accreditation.

From April 2008 the PPC and waste management regulations were consolidated into the Environmental Permitting Regulations (EPR) and operator self monitoring is a key feature of the new regime. Monitoring standards are specified within Mcerts and operator performance is

now measured under the OPRA (Operational Risk Appraisal) and OMA (Operator Monitoring Assessment) schemes. John Tipping, who manages the Mcerts scheme, will provide an update on the progress being made by these initiatives.

Mcerts 2009 will adopt a similar format to previous events with an exhibition where a number of exhibitors will launch new products or services.

For example Quantitech will launch a new mercury sampling and analysis system based on the US EPA approved Appendix K sorbent trap method, Thermo Fisher will feature a new Multi-Gas CEM system, Ashtead Technology will launch a new instrument rental catalogue and highlight the benefits of renting to reduce capital expenditure during a recession, Land Instruments will exhibit its latest opacity monitor, Casella Measurement, under its newly formed 'Monitor' brand, will launch a low entry price gravimetric particulate device, the Airmonitors stand will feature a live demonstration of the Solus public information centre and "every stand will feature industry experts offering help and



advice on any matter relating to the sampling, testing and monitoring of air quality".

Meanwhile a wide range of workshops will deliver practical help and advice on issues relating to the monitoring of emissions to air.

Speaking on behalf of the Mcerts organisers, Marcus Pattison advised visitors: "The conference presentations are repeated on both days so that delegates can make the most of the help and advice that will be available. Every visitor has an interest in testing and monitoring so most of the conference presentations, many of the workshops and almost all of the exhibition stands are likely to be of interest – it is vitally important therefore, that visitors should allocate sufficient time to fully exploit the opportunities that will be available."

● [www.mcerts.uk.com](http://www.mcerts.uk.com)

## CEMS FROM ENVIRO TECHNOLOGY

**T**he financial and process advantages of direct NO<sub>2</sub> CEMS measurement and advanced air quality monitoring for industrial fenceline applications will be just two of the topics being discussed by experts from Enviro Technology at this years conference.

Says Jim Budd, Enviro Technology's UK CEMS sales manager, who is presenting the workshop on direct NO<sub>2</sub> measurement: "Having over 25 years experience in air quality monitoring and CEM means that we are best placed to discuss, in detail, a host of subjects.

"As well as wanting to know about the latest equipment, and how it can be applied in various applications, nowadays customers want to know about the financial aspects of incorporating equipment into its air quality monitoring and CEM strategies. What will the return-on-investment be and how quickly will the costs be redeemed?"

"We have the equipment and service offering and, due to our years of experience, have the data and customer testimonials to show the financial advantages of incorporating air quality monitoring and CEMS equipment."

Each of the four subjects that Enviro Technology will be discussing has been chosen following discussion with both existing and new customers regarding topics they want to hear more about.

Enviro Technology will also be exhibiting its mobile OPSIS air quality monitoring system. The system will be monitoring air quality live outside the Bretby Conference Centre.

The company will also be demonstrating a Roadbox Chemiluminescent NO<sub>x</sub> System, a Trafficbox compact monitoring system, a Clean Air Engineering isokinetic sampling system and an OPSIS CEM analyser.

## Stack emission monitors are 'future-proof'

Instrumentation firm Quantitech is able to offer customers a revolutionary 'future-proof' gas analyser said to protect against any future requirements to monitor new parameters.

The FTIR Gasmet DX-4000 can monitor up to 300 different compounds of varying concentration and other gases can be added for future applications at little or no extra cost.

As an example of the instrument's use, one of Europe's largest carbon fibre manufacturers has recently acquired a third DX-4000 from Quantitech. The instruments operate in a dual capacity for SGL Group, in Inverness, providing data for compliance with emissions monitoring regulations in addition to continuous information on the efficiency of the company's abatement system.

FTIR stands for Fourier Transform Infrared, the preferred method for infrared spectroscopy. An FTIR spectrometer obtains infrared spectra by first collecting an 'interferogram' of a sample signal with an interferometer, which measures all infrared frequencies simultaneously to produce a spectrum.

Sample identification is possible because chemical functional groups absorb light at specific frequencies. In addition, through calibration of the spectrometer, it is possible to determine the intensity of the absorption (relative to the component concentration).

The majority of FTIR analysers are used for process control, exhaust monitoring, emissions monitoring, workplace/ industrial hygiene monitoring and research.



# What next for Aqeg?

The Air Quality Expert Group has itself been reviewed. It looks as though it won't be abolished



Aqeg's Pilling: retiring

The stream of long reports coming out of Aqeg could (in theory) come to an end – Defra commissioned a review of its future – which reported last month.

Some may be rather surprised that anybody could even contemplate the end of Aqeg which has produced important reports on pretty well all the top air quality issues of late (and most latterly ozone, see right). Who else would do this work? Certainly not Comeap, which focuses on medical stuff, nor Epaqs, which has been abolished and subsumed into Comeap. The Air Quality Forum still exists but focuses on policy and couldn't handle such technical issues.

Aqeg was formed relatively recently – 2001 – and has been led by Mike Pilling of Leeds University until his retirement which finally took place last month. No successor has been announced, and it will be hard to beat Pilling's clarity and warm nature which have ensured that Aqeg has stood apart from other rather more impersonal committees.

Aqeg was scrutinised by Defra ostensibly as part of a policy of frequent reviews, although more likely Defra is under pressure to cut the £113,000 annual cost of Aqeg. To inform the review, it commissioned a team from Enviro to produce a report which Defra has now released.

Enviro's findings centre on a questionnaire it circulated among air quality specialists. Respondents were asked for their views on the work carried out by Aqeg to date; the need for Defra to have access to advice on air quality issues; and whether an expert group was the best way to deliver this advice in the future.

Enviro's report recommends that Aqeg should be retained as it provides good quality advice and represents good value for money. *AQB* understands that Aqeg will almost certainly be retained, although a decision has yet to be formally announced.

In more detail, the questionnaire survey revealed that Aqeg commanded a high profile and "and an excellent reputation amongst external bodies working in the field of air quality".

But Enviro hints that while Aqeg has a good reputation – Defra hasn't listened to it: "While the work of Aqeg has been well received in the wider air quality community, the influence of the group on Defra policy is less apparent."

Other points include:

- Aqeg's reports are legendary in terms of their length and complexity – sometimes reaching 450 pages. This may have worked against it: "The level of detail may have reduced the effectiveness of the Aqeg reports in influencing Defra policy. It is

likely that Government policy-makers working in other relevant areas (e.g. environmental issues associated with transportation) and ministers may have similarly not had the opportunity to digest and use the findings of the Aqeg reports directly."

By contrast there was support for the level of detail in reports and consultees did not want them dumbing-down;

- Choosing Aqeg's work programme: At the moment Defra just tells Aqeg what to do, it is suggested that topic choices are made with similar openness to that of the Royal Commission on Environmental Pollution which consults on its future work programme;

- Consultees felt that there had been limited interaction with the wider air quality/scientific community, and recommended that this could be improved;

- More rapid publication of the meeting minutes would help to improve transparency." (*Editors note: "More rapid"? LOL –Aqeg hasn't published minutes since 2006 – it doesn't bother at all!*);

- Although the wider air quality community is able to comment on draft Aqeg reports, both Aqeg and in turn Defra would have benefited from greater engagement with the wider scientific community. This could have involved presentations of Aqeg work programme at seminars and conferences.

It would have been particularly helpful for this to take place at the outset of a work item for Aqeg, when other specialists could have contributed to a debate on the proposed scope of work, methods and sources of data.

It may also have been useful to give air quality specialists the opportunity to comment on interim findings ahead of formal publication of draft reports.

Future work topics were mooted:

- Target values for arsenic, cadmium, nickel and benzo(a)pyrene;
- Fine particulate matter – measurement methods; influence of particle mass/number/area/chemical composition;
- Wider range of

pollutants – e.g. photochemical oxidants, heavy metals and toxic micropollutants;

- Potential air quality effects of forthcoming changes in fuel sources e.g. wider use of biofuels;
- European regulatory policy might potentially move away from risk based regulation towards hazard-based regulation. If this were to be considered in relation to air quality management, advice from Aqeg could be useful to support Defra's negotiating position;
- Optimisation of air quality monitoring networks;
- Non-tailpipe vehicle emissions;
- Link between outdoor and indoor air quality;
- Individual and area exposure assessments; exposure reduction; links to epidemiological studies;
- Aviation and shipping emissions;
- Detailed evaluation of air quality management options/action plans and their effectiveness;
- Emergency releases.

*Review of the Air Quality Expert Group Stage 1* can be viewed on [www.defra.gov.uk/environment/airquality/panels/aqeg/](http://www.defra.gov.uk/environment/airquality/panels/aqeg/)

## COMEAP ON CEMENT FUELS

Aqeg's sister group Comeap has updated its advice on burning of substitute fuels in cement kilns.

The current statement reports an extension of the earlier work (*AQB Aug 2008 p2*) and deals with the use of meat and bone meal (MBM), processed sewage pellets (PSP) and refuse derived fuel (RDF). This new statement applies to stack emissions from the kiln and not fugitive emissions or other stack emissions on a particular site. A series of trial burns of the different fuels have been carried out and results of detailed monitoring of emissions provided to Comeap.

Comeap says: "In regard to the three substitute fuels considered (MBM, PSP, RDF) it was agreed that, based on the trial data seen by the committee, no changes in stack emissions were likely to occur that would be of significance for human health.

"This is subject to the process (control of the kiln) and inputs (fuel) being effectively managed to ensure that the appropriate limits (regarding fuel composition and emissions) were met. Comeap also advised that the method used by the Environment Agency to assess applications for the use of substitute fuels was such that as long as it was followed the Agency should not need to approach Comeap for advice regarding the possible effects on health of each proposed variation in fuel usage."

- [www.advisorybodies.doh.gov.uk/comeap](http://www.advisorybodies.doh.gov.uk/comeap)

# Ozone: an intractable problem

The Air Quality Expert Group has finalised its report on ozone. Are there any simple answers in its latest report stretching to 240 pages?

In many ways ozone is the 'odd one out' among the handful of pollutants that most air quality professionals have to handle.

It is kept out of local authority regulation as it is a predominantly regional pollutant, and as it formed from other pollutants, emission control is not easy. And unlike most other pollutants, concentrations appear to be rising.

The Air Quality Expert Group has been given the task of studying the problem – its last task given to outgoing chairman Mike Pilling. Aqeg produced a draft report last year (*AQB June 2008 p7*), it has taken until now to finalise the weighty report which will undoubtedly be used to formulate UK policy.

Findings were launched at a conference in London last month, and a key theme picked out was the growing importance of biogenic (ie vegetation-derived) emissions in the formation of ozone. Anthropogenic (ie man made) emissions are stable or falling, but with increasingly hot weather and changing planting choices, biogenic emissions are an issue that needs to be watched (see diagram below).

The first thing to learn about ozone is that nothing is simple, finds the report:

- It is a useful gas in the upper atmospheric, but poisonous to humans and plants at lower levels; It is formed from combinations of pollutants such as NO<sub>2</sub>, VOCs and vegetation;
- Ozone formation is stimulated by sunlight, so hot weather tends to produce ozone peaks, and hotter weather is predicted in coming years;
- Background ozone measured at Mace Head on the west coast of Ireland suggests 'clean' air rolling in from the Atlantic has increasing ozone concentrations;
- In recent years, peak ozone measurements have fallen, but background levels are rising;
- As NO<sub>x</sub> levels in urban areas reduces due to tightening vehicle emission standards, ozone levels are likely to rise as ozone is mopped up by NO<sub>x</sub> as it tries to convert to NO<sub>2</sub>;
- Choosing a metric for ozone is problematic – Aqeg has a page where it lists eight different metrics for ozone with their advantages and disadvantages.

Peculiarities of ozone can run on far longer. There is a whole army of climate scientists who contributed to Aqeg's report and it is necessarily very complicated. What are the main messages for those with their feet on the ground?

An annex to the report shows a range of possible future UK and global emission scenarios. Aqeg has considered the additional measures needed, beyond

foreseeable measures, to achieve compliance with a range of ozone metrics, including the scenario involving the maximum technically feasible reduction of VOC and NO<sub>x</sub> emissions in the UK and Europe.

For some of the emission scenarios considered, there would be a *worsening* of the health-related ozone metrics caused by the increase in urban ozone. There is firm evidence from both modelling and measurement that local action has only limited impact on air pollution episodes of high ozone in the UK. Large-scale reductions of 60% or more, in both the UK and Europe, of VOC and NO<sub>x</sub> emissions throughout the UK and Europe would be necessary to reduce ozone concentrations in urban areas, given the increases that will result from the decreased suppression of ozone by NO<sub>x</sub>, referred to above, and the possible future increases in background ozone.

Only some of the scenarios approach the scale of reduction needed to bring about the reduction of ozone in urban areas. In addition to local and regional reductions of NO<sub>x</sub> and man-made VOCs, any policies should take into account the impact of future global methane and carbon monoxide emissions, emissions of NO<sub>x</sub> from worldwide shipping and natural emissions

of VOCs in Europe.

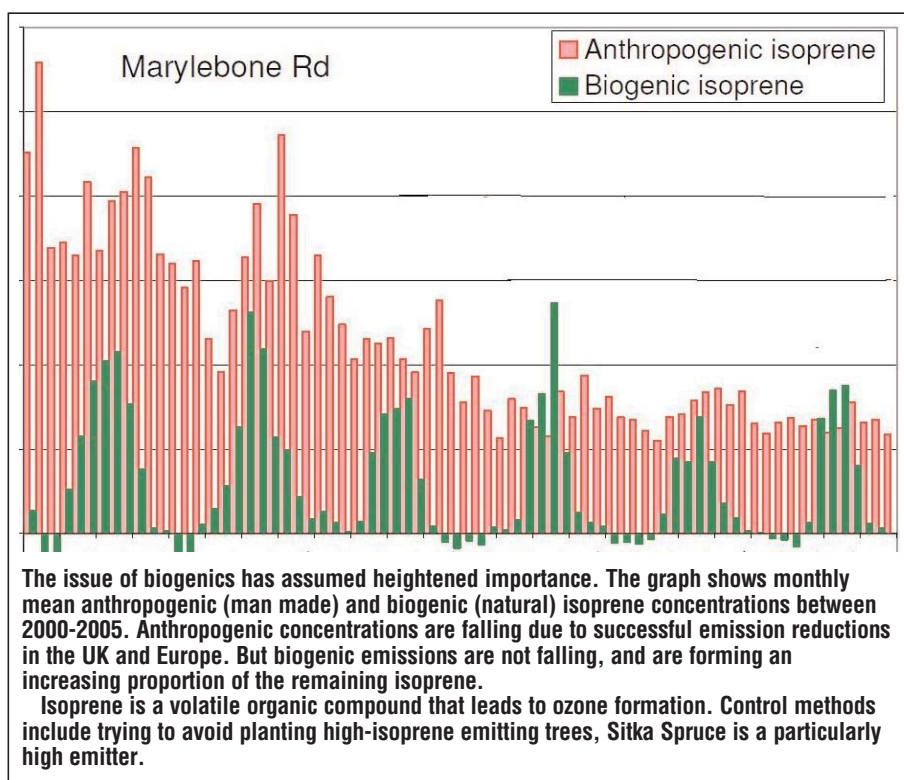
Depressing reading? It gets worse.

For ozone precursors such as methane, non-methane volatile organic compounds, NO<sub>x</sub> and CO, while UK action can be beneficial, ozone control will require emission reductions to be implemented throughout Europe and increasingly the entire northern hemisphere. Local actions, especially those of a short-term nature to address episodes of high ozone concentrations, have limited benefits.

However control of VOC (as opposed to NO<sub>x</sub>) emissions will almost always lead to an improvement in ozone air quality and a reduction in population exposure. Additional benefits result from concerted international action and from focussing the emission control on those source sectors making the largest contributions to ozone formation. Methane mitigation is seen as a cost-effective strategy on the global scale, bringing multiple benefits for air quality, public health, agriculture and the climate system.

Less attention has been paid to global carbon monoxide emissions but reduction of these emissions also has the potential to reduce ozone exposure.

- *Ozone in the UK* can be viewed on [www.defra.gov.uk/environment/airquality/panels/aqeg](http://www.defra.gov.uk/environment/airquality/panels/aqeg)



## SCIENCE SHORTS

### Ammonia is the key

In depth analysis of PM<sub>2.5</sub> concentrations has attempted to look at how they respond to cuts in precursors.

Using EMEP modelling, it was found that PM<sub>2.5</sub> concentrations do not linearly fall with reductions in SO<sub>2</sub>, NO<sub>x</sub> and ammonia and that reductions in PM<sub>2.5</sub> concentrations will need reductions in both PM<sub>2.5</sub> components and precursors. They added: "Policy makers should consider focussing on the abatement of NH<sub>3</sub> to get the largest PM<sub>2.5</sub> reduction. The non linearities identified here may help to explain why PM<sub>2.5</sub> levels in north west Europe have failed to decline despite falling primary particle emissions."

**Particulate matter at a rural location in southern England during 2006: Dick Derwent et al, *Atmospheric Environment* Vol. 43,(2009) pp689-696.**

### Black smoke to blame?

A study comparing falling levels of black smoke and population mortality risk in Holland concludes that black smoke cannot be ruled out as a potential causal agent.

**Absence of trends in relative risk estimates for the association between black smoke and daily mortality over a 34 year period in The Netherlands, Paul Fischer et al, *Atmospheric Environment* Vol. 43 (2009) pp481-485.**

### Pan-US effect seen

Risk estimates for particles appear similar in Europe and America, the APHENA study suggests.

APHENA has been set up to compare US and European particle health impacts. The combined effect of all-cause mortality ranged from 0.2% and 0.6% for a 10µg/m<sup>3</sup> increase in PM<sub>10</sub>. Overall risk assessments were similar in Europe and the US but higher in Canada.

**Acute effects of ambient particulate matter on mortality in Europe and North America: results from the APHENA study, Evangelia Samoli et al, *Environmental Health Perspectives* Vol. 116, no 11, Nov 2008 pp1480-1486.**

## TRAFFIC POLLUTION

# Well to wheels comparisons

A series of different vehicles have been tested to derive 'well to wheels' pollutant emissions.

US researchers used the Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) model to examine the well-to-wheels emissions of five regulated pollutants (VOCs, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and carbon monoxide for nine different vehicle/fuel combinations.

These were petrol cars, diesel cars, ethanol (E85) flexible-fuel vehicles fuelled with corn-based ethanol; E85 flexible-fuel vehicles fuelled with switchgrass-based ethanol; petrol hybrids; diesel hybrids; electric vehicles charged using the average grid generation mix and electric vehicles charged using the California generation mix; and hydrogen fuel cell vehicles.

Pollutant emissions were

separated into total and urban emissions to differentiate the locations of emissions, and emissions were presented by sources.

The results varied considerably. E85 flexible fuel vehicles increase total emissions but reduce urban emissions by up to 30% because the majority of emissions are released from farming equipment, fertiliser manufacture, and ethanol plants, all of which are located in rural areas.

Hybrids reduce both total and urban emissions because of the improved fuel economy and lower emissions. Electric vehicles significantly reduce total emissions of VOCs and CO by more than 90%, they increase total emissions of PM<sub>10</sub> and PM<sub>2.5</sub> by 35-325% (as a result of the coal mining and burning used to generate US electricity). However, electric

vehicles can reduce urban PM emissions by more than 40%.

Fuel cell vehicles reduce VOCs, CO, and NO<sub>x</sub> emissions, but they increase both total and urban PM emissions because of the high process emissions that occur during hydrogen production.

Researchers conclude: "This study emphasises the importance of specifying a thorough life-cycle emissions inventory that can account for both the locations and sources of the emissions to assist in achieving a fair comparison of alternative vehicle/fuel options in terms of their environmental impacts."

**Total versus urban: Well-to-wheels assessment of criteria pollutant emissions from various vehicle/fuel systems, Hong Huo, et al, *Atmospheric Environment*, Vol. 43, (2009) pp1796-1804.**

## TRAFFIC POLLUTION

# 'Effective distance' used as proxy

Detroit researchers have proposed a novel 'effective distance' metric to estimate population exposure to road pollution.

The Detroit Exposure and Aerosol Research Study (DEARS) was set up to compare exposure in small localised areas as compared to that recorded by centrally-located fixed site monitors.

Researchers noted the elevation of VOCs near a busy

roadway and explained: "A novel distance to roadway proximity metric was developed to plot the measurements and model gradients.

"Effective distance represents the actual distance an air parcel travels from the middle of a roadway to a site and varies as a function of wind direction, whereas perpendicular distance is a fixed distance oriented normal to a roadway, perpendicular distance is often

used as a proxy for exposures to traffic emissions in epidemiological studies."

The effective distance model was found to be a better measure than perpendicular distance in modelling. **Development of a distance-to-roadway proximity metric to compare near-road pollutant levels to a central site monitor, Timothy Barzyk et al, *Atmospheric Environment* Vol. 43 (2009) pp787-797.**

## PARTICLES

# Short term impacts of fine particles

Short term peaks of fine particles can cause heart impacts, Finnish researchers believe.

41 non smoking elderly subjects were monitored for heart effects and personal exposure to PM<sub>2.5</sub>. Heart impacts were categorised as a ST segment depression which is a cardiograph anomaly which is an indicator of myocardial ischemia.

Researchers concluded: "Both personal and outdoor PM<sub>2.5</sub> concentrations, but not outdoor ultrafine particle counts, were associated with ST segment depressions.

"Even very short term elevations in fine particle exposure (eg as found in traffic) might increase the risk of myocardial ischemia. The precise mechanism is unknown but could involve changes in

autonomic nervous control of the heart.

"When designing policies to reduce air pollution, the health effects of peak exposures should be considered."

**Hourly variation in fine particle exposure is associated with transiently increased risk of ST segment depression, T Lanki et al, *Occupational and Environmental Health*, 2008, Vol. 65, pp782-786.**

## SCIENCE SHORTS

## LOCAL ENVIRONMENT

## Speed cut aids air quality

Amsterdam speed limits cuts have improved air quality, monitoring suggests.

Use of speed limit reductions have been controversial in the UK with the Highways Agency refusing to countenance speed cuts for environmental purposes, however near Amsterdam, speed limits have been imposed to reduce noise and air pollution.

Speeds were cut from 60mph to 50mph in the immediate vicinity of housing and a study was set up to see what impact there was on air quality. An air quality monitor was used for a year before and after the intervention to record any changes. Readings were also compared to another stretch

further along the motorway.

Researchers concluded: "Since the intervention, the adjusted traffic contribution to PM<sub>10</sub> concentrations has decreased by 2.2µg/m<sup>3</sup>, PM<sub>1</sub> by 0.42µg/m<sup>3</sup> and black smoke 3.6µg/m<sup>3</sup>. At the section of the motorway with no change, the changes to PM<sub>10</sub> and black smoke were 0.97 and 2.43µg/m<sup>3</sup> respectively.

"This study demonstrates a significant reduction of PM<sub>10</sub> and PM<sub>1</sub> as a result of reducing the speed limit at an urban ring highway." No clear effects on NO<sub>x</sub> were seen.

They added: "The relative PM<sub>1</sub> reduction (12.7%) is smaller than PM<sub>10</sub>. A probable reason for the relatively large

effect on the reduction of PM<sub>10</sub> could lie in the fact that the traffic contribution concentration studied is not only consisting of exhaust emission, but also of resuspended particulate matter. Traffic driving speed is one of the influential factors of resuspension, less resuspension occurs at lower driving speeds. Resuspension was dominated by the coarse fraction (2.5-10 micron) the finer fractions of particulate matter are less influenced by the resuspension of road dust."

**Air quality effects of an urban highway speed limit reduction, Marieke Dijkema et al** *Atmospheric Environment*, Vol. 42 (2008) pp9098-9105.

## PARTICLES

## Marker found for air pollution

Mexican researchers have found a marker for air pollution in exhaled breath.

Researchers evaluated the use of exhaled breath condensate malondialdehyde as a biomarker of exposure to traffic related pollution in children with asthma as part of a panel study in Mexico.

480 samples of malondialdehyde were collected from 107 patients with asthma living within 5km of an air quality

monitoring site. Ambient PM and ozone was significantly associated with higher malondialdehyde levels, while malondialdehyde levels were inversely associated with FVC and FEV lung functions.

Researchers concluded: "To our knowledge, our study is the first that evaluates the use of malondialdehyde in exhaled breath as a biomarker of effect of traffic related air pollutants in a free living population of

children with asthma. This maker of oxidative stress might be a useful tool in epidemiologic studies of air pollution conducted in susceptible children eg. those with asthma."

**Exhaled breath malondialdehyde as a marker of effect of exposure to air pollution in children with asthma, Isabelle Romieu et al, Journal of Allergy and Clinical Immunology, 2008 Vol. 121 pp903-9.**

## TRAFFIC POLLUTION

## Air pollution affects asthmatic kids

A large panel study has unveiled the impact of air pollution on asthmatic children.

US researchers analysed data from 861 children with persistent asthma living in seven cities. Two week periods of twice daily lung tests were carried out over a period of two years and compared to asthma symptom data and air pollution readings.

Researchers concluded: "We observed significant associations between pollutant exposures and respiratory health outcomes in a large sample of

children with asthma in seven urban US communities, despite the fact that the daily pollutant concentrations were almost all below the current air quality standards. Higher concentrations of NO<sub>2</sub>, PM<sub>2.5</sub> and SO<sub>2</sub> were associated with more frequent asthma symptoms and asthma-related school absences. We observed associations between five day average pollutant concentrations and lung function decrements that were not seen for single day average concentrations, suggesting that some of the effects of inhaled

pollutants on the lower airways require exposure longer than a single day."

The researchers say that associations between NO<sub>2</sub> (at concentrations below standards) and lung function have important implications for air quality regulation and urban transportation policy.

**Acute respiratory health effects of air pollution on children with asthma in US inner cities, George O'Connor et al, Journal of Allergy and Clinical Immunology, 2008, Vol. 121 pp1133-9.**

## DNA risk

Diesel exhaust exposure has been found to contribute to DNA mutation load in humans and to lung cancer risk.

**The carcinogenic air pollutant 3-nitrobenzanthrone induces GC to TA transversion mutations in human p53 sequences, Jochen vom Brocke et al, Mutagenesis 2009 24(1):17-23**

## Pollen and PM

Spanish researchers have found that particles and pollen episodes lead to increased emergency calls – but did not find a synergistic effect.

**Effect of short term exposure to air pollution and pollen on medical calls: a case crossover study in Spain, E Carracedo-Martinez et al, Allergy, Vol. 63, pp347-353.**

Finger pointed at short term NO<sub>2</sub>

US researchers say that short term increases of NO<sub>2</sub> below air quality standard levels can still cause adverse health effects.

Researchers analysed data from 861 children with persistent asthma in seven US urban communities. Subjects performed two week periods of twice daily pulmonary function testing over six months for two years, with asthma symptoms collected every two years and compared with pollution measurements.

**Acute respiratory health effects of air pollution on children with asthma in US inner cities, G O'Connor et al, Journal Allergy Clin Immunol. 2008 121(5) pp1133-1139.**

## Ozone affects elderly

Ozone affects the elderly and not just the young, US researchers suggest.

1100 elderly men had their lungs studied every three years with ambient ozone measured in their vicinity. A 15ppb increase in ozone was associated with a 1.25% decrease in lung function. **Ozone exposure, antioxidant genes and lung function in an elderly cohort: VA normative aging study, S Alexeeff et al, Occupational and Environmental Medicine, 2008, Vol. 79 pp736-742.**

## HOT AIR

The GLA environment committee's hearing into air quality proved interesting viewing (it can be seen on a webcast if you have a spare 90 minutes).

Having made an excellent start on air quality, in recent times Defra appears to have lost its way and while we're a great fan of its air quality boss Martin Williams, we think he looked weary and unconvinced by his own answers to the inquiry. Of course he does have a hard position to sell, given that its submission to Brussels on meeting PM<sub>10</sub> objectives involved a series of excuses why it should do nothing.

TfL's LEZ chief Nick Fairholme provided the non-answer of the event. This was one of those responses where you felt like screaming at the chairman to get the witness to answer the question. Fairholme was asked whether Boris Johnson was told that the justification for phase three of the LEZ would spare 107,000 from air quality, ergo abolishing it would remove that benefit?

Fairholme's incomprehensible answer was that it is impossible to disaggregate the benefits of stage three. Ehhh? If the benefits were disaggregated to justify the go ahead, then they can also be used to spell out consequences of not going ahead.

But if we are bemused by Defra's inertia and TfL protecting Boris, the greens can take equally untenable positions without having to be held accountable. John Whitelegg told the inquiry: "We must eliminate PM<sub>2.5</sub> from the urban environment."

Think about that for a second!

It's official – jargon is bad, even for the public sector.

The Local Government Association (LAG) has published a list of 200 words and phrases that public bodies "should not use if they want to communicate effectively with local people." Well done the LGA – AQB gets particularly annoyed by jargon such as 'going forward', it is usually a means of delivering style rather than substance.

LGA adds: "The public sector must not hide behind impenetrable jargon and phrases. Why do we have 'coterminous, stakeholder engagement' when we could just 'talk to people' instead?"

Words and phrases to avoid include strategic, sustainable, synergies and toolkit. Oh dear, are Epuk conferences ever going to be the same again!



SupportingU seem to be everywhere at the moment including up in the sky.

We hear that SupportingU's Richard Wyatt jumped out of a plane to raise money for charity. SupportingU is a particularly apt caption for our pic of Wyatt's first jump.

## AIR QUALITY EVENTS 2009

**2nd-3rd April**

### AIR QUALITY SPRING WORKSHOP

Epuk air quality spring workshop to be held in Highgate House, Northampton. [www.environmental-protection.org.uk](http://www.environmental-protection.org.uk)  
Carry Keay 01273 878776

**20th-21st April**

### 2009 INDOOR AND OUTDOOR AIR POLLUTION RESEARCH

Meeting to be held at Cranfield, [www.le.ac.uk/ieh](http://www.le.ac.uk/ieh)

**24th April**

### LAQN SEMINAR

London Air Quality Network Seminar to be held in London, [www.londonair.org.uk](http://www.londonair.org.uk)

**29th-30th April**

### MCERTS 2009

MCERTS conference, exhibition and workshops, air & emission monitoring. A specialist conference, exhibition and workshops for Air Monitoring to be held at Bretby. website [www.mcerts.uk.com](http://www.mcerts.uk.com)

**19th-20th May**

### ULTRAFINE PARTICLES – SOURCES, EFFECTS, RISKS AND

Mitigation Strategies, European Federation of Clean Air and Environmental Protection Associations conference to be held in Brussels, <http://efca.net>

**23rd-25th June**

### 12TH CONFERENCE ON COMBUSTION GENERATED NANOPARTICLES

to be held in Zurich [www.lav.ethz.ch/nanoparticle\\_conf/index](http://www.lav.ethz.ch/nanoparticle_conf/index)

**11th June**

### INVESTIGATION OF AIR POLLUTION STANDING CONFERENCE

Iapsc conference to be held in Birmingham. Website [www.iapsc.org.uk](http://www.iapsc.org.uk)

**15th-17th September**

### MEASURING AIR POLLUTANTS BY DIFFUSIVE SAMPLING

and other low cost monitoring techniques, AAMG international conference with posters and exhibition to be held in Krakow, Poland <http://rsc-aamg.org>

**12 November**

### AIR QUALITY UPDATE

EPUK conference to be held in Birmingham, Carry Keay 01273 878776 [www.environmental-protection.org.uk](http://www.environmental-protection.org.uk)

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*Jack Pease*