

AIR QUALITY

November 2008 Issue 31

BULLETIN

MONITORING

£1.5m Teom spending spree

Defra has chosen Air Monitors to supply 70 Teom FDMS's for the national air quality monitoring network. 35 are already in place, the rest will be installed by the end of the year.

In what is perhaps the largest and most hotly-fought monitoring equipment contract for the last decade, the equipment will measure PM₁₀ and PM_{2.5} in a bid to comply to the letter of the law of the new EU air quality directive (2008/50/EC). Air Monitors says the Teom FDMS is the only monitoring technology shown to meet the requirements of the EC PM monitoring standard on equivalence without the use of a correction factor for both PM₁₀ and PM_{2.5} fractions.

It adds: "Air Monitors is exclusively able to supply Teom FDMS systems that meet the equivalence criteria and systems identical to the ones supplied to Defra are now available for supply to local authorities and industry who wish to conform to the highest standards of particle monitoring available."

This is the second major

supply contract awarded by Defra to Air Monitors during 2008, earlier in the year the company was chosen to supply 22 black carbon monitors, most of which have now been installed and are generating automated data to supplement the PM measurements provided by the Teom/FDMS systems (*AQB April p7*).

Behind the headline news, the contract announcement hides many subtleties that will interest those that track the fortunes of the Teom. Europe does not like the standard Teom which boils off volatiles and requires a 1.3 factor to compensate for the lost mass. But the UK does like the Teom as it is reliable and yields real time data.

In a bid to convince Europe that the Teom – with the FDMS modification – is equivalent, Defra carried out equivalence tests. These proved the Teom 'B' series with FDMS was equivalent (*AQB July 2006 p1*). But since then, Teom-maker Thermo no longer markets the Teom B, its Teom C is not (to the letter of the law) equivalent.

Jim Mills of Air Monitors has been involved with the testing and development of Teoms long before Thermo took over Teom-maker R&P, and was able to offer Defra the ability to reconfigure currently-available Teoms into the 'B' configuration that received equivalence approval.

Jim Mills said: "Anyone can buy Teoms from the manufacturer, but not everyone can make the instruments operate the way we do."

Teom 1400 lives on

The old style 1400 Teom will continue to be available (*AQB September p4*).

Air Monitors will continue to supply the Teom and Teom FDMS to the equivalence specification (see above). Meanwhile the new 1405 is currently commercially available and is undergoing equivalence testing. It is expected that the 1405 will eventually replace the existing Teom 1400 and FDMS 8500 models.

● www.airmonitors.co.uk

Sanctions sought

The Campaign for Clean Air in London (CCAL) is encouraging the European Commission to take the UK to court for failing to meet its air quality obligations.

It believes the Government "is making no meaningful effort to comply with limit values for NO₂ by 2010 and has no date planned for eventual compliance".

In response to the Government's consultation on the exemption (*AQB September p11*), CCAL says: "Firstly, the draft does not show or refer to any expected date by which the UK will ensure compliance with either of the limit values for NO₂. Second, the plans and programmes currently proposed together are clearly insufficient to achieve the limit values for NO₂ or indeed to make any reasonable effort to do so by the required dates.

"Third, the report includes no contingency plans to comply with the time extension obligations for NO₂ under the new legal regime if the UK fails to meet the limit values for NO₂ by January 2010 (as currently seems likely). CCAL is disappointed that the first two points have not been addressed in the current report when it raised them in the identical consultation some 12 months ago.

"In CCAL's view, the Commission could commence legal action against the UK for breaching limit values for NO₂ as soon as there is sufficient evidence that breaches of the hourly limit value have occurred. Results from 2008 indicate that this could happen as early as 31 January 2010."

CCAL is also on the Government's back about PM₁₀.

It tabled a House of Lords question which forced the Government to admit that it hadn't met the 31st October deadline for telling the Commission its plans for meeting PM₁₀ requirements.

● www.cleanairinlondon.org

POLICY

More details emerge on Defra derogations

Speaking at the recent Epuk air quality update meeting held in Birmingham, Defra's Jonathan Lartice revealed further details on how the Government intends to take forward 'compliance flexibility' – essentially a three year derogation from meeting the EU air quality directive.

Any member state applying for the derogation must supply the EU with an action plan on

how the limit value will be met by the end of the three year derogation. For PM₁₀, only the London region is expected to exceed objective limits, and Defra must develop plans shortly (see right).

The shape and complexity of the action plan that must be submitted to the Commission is unclear – it could be as little as a document pointing the

Commission to activities being carried out by the UK Government and local authorities, or it may be far more detailed and contain new initiatives.

Lartice revealed that a group of 'delivery partners' had been set up including GLA/TfL, the City of London, Westminster City Council and the London

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Defra desperate, chimneys on their side and excitable modellers

IN BRIEF

Oldies for IAQM

The Institute of Air Quality Management has decided to accept fellowship applications.

Candidates for election to the class of Fellow shall be at least 35 years old and be able to fulfil the following criteria:

- Hold a relevant degree (or be able to demonstrate education to a comparable level);
- Have at least ten years full time experience in one of the following fields: air quality management, air quality policy, research, monitoring, modelling, emission inventories, and other related and relevant areas to satisfy the membership committee;
- Hold a responsible position within the field of air quality.

● www.iaqm.co.uk

Data done

2006 1x1km CO₂ emissions data is now available by local authority area. Also 2006 1x1km emissions data has been posted on the NAEI data warehouse.

● www.naei.org.uk

Fees set out for LAPC

Defra has outlined the level of charges that can be levied by councils for their industrial regulation activities.

In future reviews will take place every two years. Regulation charges will go up in interim years based simply on inflation.

The consultation proposes a general 3.1% rise in local authority income – but lower risk activities will rise by only 2.8% while higher risks by 4.2%.

Application charges for standard Part B activities will be £1561 in 09/10 (£1514 the previous year) and for standard Part A(2) activities £3181 (£3085 in the previous year). A table of rates is included within the consultation.

● *Consultation on local authority environmental regulation of industrial plant: 2009/10 fees and charges* can be viewed on www.defra.gov.uk/corporate/consult/localauth-plantfees09-10/index.htm

NEWS FROM EPUK'S AIR QUALITY UPDATE MEETING IN BIRMINGHAM

Defra policy: from page one

boroughs of Barking and Dagenham, Camden, Greenwich, Hackney, Hammersmith and Fulham, Islington, Lambeth, Newham, Kensington and Chelsea, Southwark and Tower Hamlets. These were convened for a meeting and were asked to provide information on what they are doing on air quality.

Lartice reports these authorities have been “very cooperative and enthusiastic”. “It would be a bit irresponsible for us to rely solely on the GLA to meet the objectives – so we will need additional measures, such as tackling van emissions and ‘gap analysis’.”

Local authorities are being asked to tell Defra of measures which could be included in the time extension action plan, with quantification if possible: “Local measures, even where the impact on measured concentrations appears minimal,

remain very important.”

One authority commented: “It’s not a thinktank as such, rather a means by which Defra can ask authorities for information needed to support its case. An action plan will then be drawn up which they will consult on in early 2009.” They added that Defra was “scratching around” for actions however tiny “because they’ve done diddly squat themselves”.

Lartice again: “We aim to send the Commission the action plan in early summer then we’ll wait and see what happens. It will be interesting to see what happens with 26 states in a similar position to us. What will the Commission do with member states that won’t meet the objective?”

That’s for PM₁₀ – the whole exercise has to be repeated for NO₂ for which there are more widespread exceedences. Instead of the one zone for

PM₁₀, there will be one zone exceeding the annual average NO₂ limit at the background and 26 have roadside exceedences.

Lartice said: “It is much more of a challenge to discuss measures to meet the NO₂ limit. Measures may not be popular with the electorate.” The measures needed to meet objectives by 2015 will be developed over the next 12 months with consultation in late 2009.

Moving on to the recent consultation on the shape of policy and technical guidance for local air quality management, Lartice said that the department had received some 24 responses. These focused on the lack of uniformity across schemes, the size of the guidance and difficulty implementing it. Some were keen to get more direction on measures which worked best, he added.

BIOMASS

Guidance nears on biomass installations

Ruth Calderwood of the City of London told the Epuk conference held in Birmingham about the development of guidance for biomass boilers.

The guidance is aimed at local authorities faced with applications for biomass boilers in urban areas where PM₁₀ pollution may be a problem. An AEA report commissioned by London Councils showed that moderate update of biomass could lead to a 14µg/m³ rise in PM₁₀ emissions in areas that may already be over limits (*AQB December 2007 p3*).

Epuk and Lacors are taking a lead on producing the biomass guidance with a working group that includes Defra, the Environment Agency, GLA, industry, local authorities, London Councils, AEA and the Carbon Trust. It will produce guidance for air quality professionals and a leaflet for developers giving advice on what local authorities expect, and why. Consultation on a draft is expected next month, with the aim to publish early in 2009.

Calderwood said: “If you try to use the Clean Air Act to control biomass, it simply isn’t fit for purpose. Specifying exempt appliances isn’t enough either, as the limits are often quite high.”

Advice on assessing potential air quality impacts will include:

- How to assess an application;
- Example ‘information request’ form;
- Stack height – dispersion modelling / D1;
- Chimney height memorandum;
- Cumulative impact (AEA screening assessment tool);
- Exempt appliances;
- Unit conversion tool (as boiler specifications can come in a myriad of units);

Advice on mitigating air quality impacts includes:

- Boiler specification – how this can influence emissions;
- Fuel specification (e.g. pellets v. wood chip, quality standards, storage);
- Abatement equipment (what is currently available and feasible).

Developer guidance will

cover:

- Background to LAQM;
- Regulations;
- Information a local authority may request;
- Performance of appliances;
- Fuels;
- Fuel storage;
- Deliveries;
- Ash removal.

Camden’s Gloria Esposito added that air quality officers should forge close relationships with planners given the 10% rule on renewables.

She said: “Planners are aware that the air quality officer should comment on applications including biomass boiler/CHP. They should attend pre-application meetings for major developments outlining air quality issues related to biomass boilers.”

The council has dedicated pages on its website on biomass and air quality which outlines guidance for developers. She also highlighted sample planning conditions and clauses for section 106 agreements that could be used to control biomass plant and use.

NEWS FROM EPUK'S AIR QUALITY UPDATE MEETING IN BIRMINGHAM

Air quality Beacon year ends

The Beacon year is now over – but there is still some life in them yet, Sefton's Gary Mahoney told the Epuk air quality update in Birmingham last month.

Sefton is one of four Beacon air quality authorities, and Mahoney was reviewing the end of the air quality 'Beacon year'. The Beacon scheme, run by the Government, now switches to a set of different themes, one of which is climate change. Beacons authorities (including Sefton, Sheffield and Greenwich) were chosen as being good examples of authorities doing excellent work on air quality and in a position to spread good practice to other authorities (*AQB April 2007 p3*)

Mahoney said: "This is the end of the Beacon year and the organisers have said that the air quality pages on the Beacon website were the most visited of any of the Beacon themes. Sefton and Greenwich held successful conferences – while Sheffield has continued to run the Care4Air theme."

The Care4Air brand may be rolled out across the country with locally-tailored versions used by other authorities. Sefton is using theatre to spread the air quality message with kids in ten schools acting out air quality

plays. Feedback from teachers is good and knowledge among children is improving, said Mahoney.

He added that his authority had been trialling 'R' software developed by David Carlaw of Leeds. This is a computer programme that makes it possible to analyse air quality data more effectively (*AQB June p3*).

R now has three years of continuation funding from NERC with the aim of making it more user friendly: "R will be developed to provide a menu of options for users and we are now looking for people to test it. If you want to examine some data, these are the tools to help you do it."

He quoted an example of a suspect road junction in Merseyside which had high exceedences. By using the R software and feeding in particle levels and wind speeds, it was possible to pinpoint the sources to two scrap metal yards and unsurfaced roads. "The simplicity and speed (five minutes) of doing this analysis has real benefits."

Another output from the Beacon authorities has been the low emissions strategies working group cooperation chaired by Sheffield (*AQB May*

p8).

The Beacon group has a number of initiatives including:

- Peer supported projects, demonstrating progress in managing the transport impacts of new developments though the use of low emission strategies;
- A benchmark to enable local authorities to measure their practice against;
- A toolkit to help authorities define a performance improvement pathway;
- A training module and regional training workshops providing practitioners with detailed information, advice and support;
- An accompanying communication strategy to raise awareness and understanding of the Beacons Low Emission Strategies guidance, benchmark, toolkit and training module;
- Participating authorities will also work closely with Defra supporting policy development, helping to strengthen national policy and guidance on the use of low emission strategies.

There are 15 authorities involved in the peer group: Greenwich, Sheffield, Sefton, City of London, Leeds, Oxford, Leicester, Wigan, Maidstone, Lewes, Tunbridge Wells, South Cambs, Mid-Devon, Wandsworth and Croydon.

CLIMATE CHANGE

Agencies gears up for global warming

The Epuk conference in Birmingham last month heard how the Environment Agency is attempting to integrate climate change into industrial permitting.

Andy Malby of Lancaster University is sponsored by the Environment Agency and is studying climate changes impacts. He reminded the audience of the obvious climate change impacts on air quality:

- More frequent summertime ozone episodes will lead to increased mortality and hospital admissions, due to impact on respiratory system and lung function;
- Non-linearity between rate of emission decline of

acidifying pollutants and the rate of recovery of acidified areas will lead to a delay to recovery of upland ecosystems;

- Greater impacts under climate change likely due to more vigorous convective turbulence and a greater frequency of westerlies is likely to lead to more plume grounding and

increased concentrations near power stations;

- Drier summers and higher winds could lead to considerably more fugitive emissions of PM₁₀ than currently.

Malby says: "This has obvious implications for sites such as Scunthorpe steel works that have large areas of unpaved roads and stockpiles. There will be more wind, more dispersion, an increased risk of erosion and higher emissions because of drier summers in recent years."

He added that dispersion modellers needed access to far more accurate climate predictions, down to hourly detail.

Climate indicator starts to kick in

Climate change indicator NI186 has been adopted by two thirds of UK local authorities, the Energy Savings Trust's Andy Deacon told the Epuk conference.

Deacon, previously with the GLA and before that the Sussex Air Quality Steering Group, pointed out that 2006 figures had just been released. These will form the basis for authorities calculate carbon savings.

IN BRIEF

Climate challenge

As Beacons move on from air quality, the City of London is one of the authorities nominated as a climate beacon.

Speaking to the Epuk conference, the City's Simon Mills said: "We were the first authority to adopt a dedicated adaptation strategy – if you treat climate adaptation as a business risk rather than simply a green issue, it's a much easier problem to solve."

He added that the legal position is now firming up: "The effects of climate change can now be regarded as reasonably foreseeable and at every stage of infrastructure and service delivery it must be incumbent on professional advisors to ensure that appropriate steps have been taken – there is now a fundamental duty of care."

He noted links between climate change and air pollution including:

- Heatwaves can create the conditions for high air pollution levels. These can be exacerbated by the urban heat island effect;
- Mitigation measures can exacerbate air pollution;
- Climate friendly policies may have air quality impacts: "Biofuel boilers are particularly unsuitable for urban areas.";
- Adaptation measures can exacerbate air pollution – for example air conditioning can increase both street level temperature and enhance the risk off Legionella.

Ships cut emissions

The International Maritime Organisation's Marine Environment Protection Committee (MEPC) has agreed revised pollution limits for shipping.

Shipping emissions are forming an increasingly large proportion of UK and European pollution.

IMO says the main changes would see a progressive reduction in emissions of sulphur oxide (SO_x), NO_x and particulate matter from ships.

The revised rules, and the associated NO_x Technical Code, will enter into force on 1 July 2010.

IN BRIEF

More Heathrow woes

Opposition to the continued expansion of Heathrow is building up.

Soon after the Conservative Party said it would not support a third runway if elected, the Environment Agency chairman Lord Smith told the BBC that a third runway at Heathrow Airport would be "very detrimental" to Londoners' health.

BBC reports Lord Smith as saying: "All the studies we've done in the Environment Agency of the likely impact of air quality on west London are very detrimental. If the third runway goes ahead, if we get the extra air and ground traffic that will arise out of that, then it is absolutely certain that nitrogen dioxide levels will go way beyond what they ought to be for the sake of human health."

Last year Agency officials noted their reservations on Heathrow (*AQB July 2007 p1*).

US wood burners

US wood stove makers have agreed to cuts in emissions.

The US Environmental Protection Agency reports that key manufacturers of outdoor wood-fired heaters pledged to make units that will emit 90% less air pollution under the second phase of a voluntary partnership with EPA.

EPA launched the voluntary programme in January 2007, beginning with units 70% cleaner than unqualified models. Sales of EPA-qualified units to date will prevent nearly 1,200 tons of fine particle emissions annually, providing more than \$600 million in estimated annual health benefits.

Under a voluntary agreement with EPA, seven heater manufacturers have pledged to make at least one unit meeting new, stringent emission levels in the second phase of the program. The new models must emit no more than 0.32 pounds of particle pollution per million Btu of heat output.

UK is currently considering how it can clean up stoves.

● Further information www.epa.gov/woodheaters

GOVERNMENT

All change – Shaw out, Hunt in

Prime Minister Gordon Brown's recent Cabinet shake up sees air quality and noise minister Jonathan Shaw moving on. He had been in office for a year (*AQB August 2007 p3*).

The shake up led to the creation of a new combined energy and climate change department (DECC) headed up by Ed Miliband. Climate change posts will be transferred from Defra but other environmental responsibilities remain – in an unusual move new air quality minister Lord Phil Hunt will spend half of his time at Defra, and half at DECC in order to coordinate climate change and pollution responsibilities that lie across both departments.

Hilary Benn continues as environment secretary. Hunt (Lord Hunt of Kings Heath) has the formal title of minister for sustainable development, climate change adaptation and air quality. This brief includes noise and environmental regulation (although the Environment Agency is the responsibility of Jane Kennedy).

The Environmental Industries Commission commented on the move: "Giving energy and climate change policy its own seat at the cabinet table will facilitate the kind of joined up decision making we need.

"The first priority of the new department must be to enhance both energy efficiency and reduce absolute energy demand.



New air quality minister Hunt

The new department must not, however, draw attention away from tackling the equally challenging issues we face, such as vastly improving resource efficiency and air quality."

● www.decc.gov.uk

REGULATION

Agency solicits views on Monckton works

The Environment Agency is consulting directly with local residents to see whether they are happy with levels of nuisance emissions from the Royston Monckton Coke and Chemical site near Barnsley.

Two years ago the Environment Agency put pressure on the plant to use best available technology to cut sulphur dioxide emissions which could have prompted the need for an air quality management area (*AQB November 2006 p1*).

It gave the plant a 15-point improvement programme requiring the company to

improve operations of the coke ovens.

Agency inspector Ian Foster said: "Monitoring results are showing us that there has been a reduction in emissions since mid-March this year but it is very important that we compare this information with the views of local people about the plant. This will ensure that we are directing our efforts into improving the way the plant is run, to produce a positive effect in Royston and the surrounding areas".

7,000 households lying within a 2km radius of the site will be

sent an information pack containing a fact sheet and a booklet allowing residents to record information about anything that they might see, smell or hear from the plant – such as dust, smoke, smells, noise or bright lights.

Ian Foster said: "We are asking local residents to regularly record their findings and return the logs to us. We will also provide for a longer period of recording observations for residents who wish to take part, and a follow-up next year to check that improvements have been made."

CLEANER FUELS

Camden welcomes portable fuel cell pack

Camden has revealed details of a hydrogen fuel cell generator which can be used to power roadside emissions testing equipment. It is offering to lend the equipment to other London boroughs.

Camden says the fuel cell generator will primarily be used to power vehicle emissions testing equipment used by the VOSA testing agency. Gloria Esposito told *AQB*: "We have also used the fuel cell for temporary power at council events. We are keen to lend the fuel cell generator out to other local authorities in London to



promote innovative and clean technology."

Funded by TfL, the 5kW portable hydrogen fuel cell generator project is being carried out in partnership with the London Hydrogen

Partnership, the Vehicle Operating Standards Agency (VOSA) and Air Products.

When not used for roadside testing, the generator will be used to power lighting and sound equipment at council events such as Camden's green fair and car free day and as a temporary back up power source at the council transport depot.

The fuel cell generator is housed in a trailer so is portable. It is towed around by Camden's Modec electric van.

● Further details email gloria.esposito@camden.gov.uk

OZONE

Royal Society targets ozone ...

The Royal Society says ozone is a growing problem and that current emission controls are not enough to reduce concentrations.

The new report from the think tank is based on work of a committee headed by Professor David Fowler and experts including Ross Anderson, Dick Derwent, Frank Kelly, Mike Pilling and Mike Ashmore. They say: "Ozone concentrations have continued to increase in many parts of the world despite the efforts of many countries to reduce the pollutants that lead to ozone formation. Existing emission controls are insufficient to reduce current background ozone

concentrations to levels acceptable for human health and environmental protection."

- Action should include:
- Reducing both background and peak ozone, at global, regional, and national scales;
 - Controlling emissions from poorly regulated sources including international shipping, aviation, and biomass burning;
 - Improving integration between climate change and ozone policies;
 - Facilitating global action to implement current emission controls, particularly of NO_x.
- It urges local authorities to implement VOC emission controls in large urban areas where NO_x controls are

contributing to increasing local ozone concentrations; and the UK Government should implement regional scale VOC emission controls.

Kings College London ERG's Frank Kelly told *AQB*: "If we accept that over 1500 deaths in the UK during 2003 were attributable to ozone – then this figure is expected to rise by more than 50% in the next 20 years. Also, it's the usual suspects – children, asthmatics and the elderly – who are particularly vulnerable to ozone."

● *Ground-level ozone in the 21st century: future trends, impacts and policy implications* <http://royalsociety.org>

...as WHO also notes need to work harder

The World Health Organisation's European centre has produced a report on the health risks of ozone.

Put together by experts including the UK's Dick Derwent and Fintan Hurley, the report warns that current policies are not sufficient to reduce ozone levels in the region or their impact in the next decade.

WHO says on health effects: "As to short-term exposures, recent epidemiological studies have strengthened the evidence that daily exposures to ozone increase mortality and respiratory morbidity rates. As to long-term health effects, the evidence is still too limited for firm conclusions to be drawn, but in the future it may be possible to identify health effects from long-term

exposure.

"It is estimated that some 21,000 premature deaths a year are associated with ozone exceeding 70µg/m³ in the EU25. The slight decline in ground-level ozone expected to result from current legislation is estimated to reduce premature mortality by only some 600 cases per year between 2000 and 2020. Markedly larger (around 40%) reductions could be achieved by implementing the maximum technically feasible reduction scenario.

Ozone is also associated with 14,000 respiratory hospital admissions annually in EU25. Expected reductions in morbidity outcomes related to the implementation of current policies are more significant than those for mortality, ranging from approximately 8%

(respiratory medication use of adults) to 40% (cough and lower respiratory symptoms in children). But hospital admissions associated with ozone exposure are expected to increase owing to changes in population structure and larger populations of older people.

The current health impact estimates consider only acute health effects, and do not account for possible effects at short-term ozone exposure levels below 70µg/m³ or possible effects from long-term exposures. While the premature mortality associated with ozone is lower than that associated with PM_{2.5}, ozone is one of the most important air pollutants in Europe.

● *Health risks of ozone from long-range transboundary air pollution* www.euro.who.int

CONCENTRATIONS

WHO prompt child exposure summary

WHO has set out a table of exposure of children to particle pollution.

ENHIS (the European Environment and Health Information System), coordinated by WHO Europe, has ranked children's particle exposure. Romanian children suffer the most, Finland the least, the UK comes in as the 9th cleanest out of 27.

- Findings include:
- Country average PM₁₀

exposure levels varied from 16µg/m³ (Finland, Ireland) to 50-52µg/m³ (Bulgaria, Romania). A wide (three-fold) variation in the level of exposure of children to PM₁₀ was observed in some countries;

- The country average level of the indicator has not changed substantially in the last few years in most of the WHO European Region. In 2006, PM₁₀ levels were higher by at least 5µg/m³ than in 2004 in four

countries (Austria, Hungary, Norway and Poland) and lower by at least 5µg/m³ in another four countries (Bulgaria, Greece, Serbia and Slovenia);

- Most (90%) of people in European cities where PM₁₀ is monitored are exposed to PM₁₀ levels exceeding the WHO air quality guideline level (20µg/m³). For 13% of people, the EU limit value of 40µg/m³ is exceeded.
- www.enhis.org

IN BRIEF

Travelbuster launch

Epuk has launched a new online travel calculator to encourage kids to walk to school.

As part of *International Walk to School Month*, Epuk's Travel Buster is a colourful cartoon calculator aimed at encouraging 7 – 11 year olds that walking, or cycling, to school is healthier for them and their local environment.

The Travel Buster takes pupils through simple steps to assess the impact of their school journey on their health, local air pollution and noise pollution. The Travel Buster was developed by Epuk with funding from The Body Shop Foundation.

- www.travelbuster.org.uk

California gets tough

Californian legislators have proposed new rules to tackle truck emissions.

One proposed regulation will require truck owners to install diesel exhaust filters from 2010, with nearly all vehicles upgraded by 2014. Owners must also turn over engines older than the 2010 equivalent according to a staggered implementation schedule between 2012 and 2022. Long haul truckers must install fuel efficient tyres and streamline kits to improve fuel economy.

£1bn dollars in grants will be available to help fund the improvements.

- www.arb.ca.gov/newsrel/newsrel.htm

Emissions report out

A new NAEI report presents the latest estimates of emissions to the atmosphere from the UK for the period 1970 to 2006.

There are 44 pollutant species included in the 2006 annual inventory, Emissions of all pollutants have decreased during this period from 1990 to 2006, the inventory does not make the same comparison between 2005 and 2006 when a number of pollutants rose.

- *UK Emissions of air pollutants 1970 to 2006* can be viewed on the reports section of www.airquality.co.uk

IN BRIEF

Use more traps

Particle trap makers have come together to call on the Government to adopt guidance for local authorities to reduce emissions from construction and demolition sites.

The renewed call came within the Environmental Industries Commission's (EIC) response to the Defra consultation on local air quality management guidance.

"EIC welcomes the guidance to help local authorities improve the management of air quality in their areas, however the government's plans so far ignore the problem at construction sites. When you consider that construction sites are estimated to be responsible for 16% of road transport emissions of particulate matter – and that the UK is already on course to fail to meet many of its air quality obligations – this is simply not good enough.

"EIC is urging the government to urgently come forward with guidance to local authorities to tackle air quality at construction sites. This must facilitate coordinated action across all aspects of managing a construction site, including emissions from non-road mobile machinery – with a clear recommendation to fit suitable pollution control technologies to the most polluting machinery."

- www.eic-uk.co.uk

Cranfield call

Next year's Department of Health/HPA indoor and outdoor air pollution research workshop will be held at Cranfield University on 20-21 April.

- www.le.ac.uk/ieh

Electric potential

Cenex and Arup have recently completed a study of the scope of the UK transport sector to switch to electric vehicles and plug-in hybrid vehicles.

This study considers a wide range of issues relevant to the development and roll out of electric vehicles.

- www.berr.gov.uk/files/file48653.pdf

INFORMATION

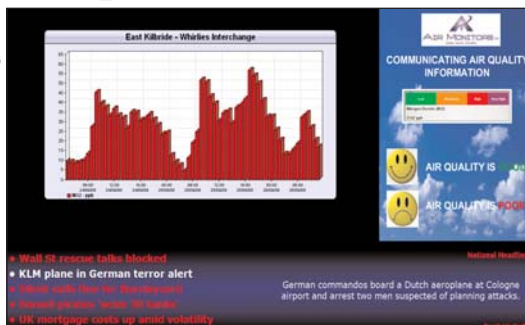
Monitors spread the message

Air Monitors has teamed up with Solus to provide a broadcasting system aimed at spreading air quality messages to the public.

Air quality information can be fed into monitors in public places such as town halls, stations and high streets in a bid to change the behaviour of vulnerable groups and polluters.

Air Monitors has a weblogger system which 'pushes' data from monitoring sites to a powerful central internet server. This is in contrast to conventional dial up systems or even IP based systems which 'poll' the data on demand.

Air Monitors' Jim Mills said: "The advantage of our system is that each station is autonomous and sends its data as soon as it's measured back to the central server, it requires no human



intervention and no central automated dial up. This makes it faster and cheaper to run, making data available in a timelier and more frequent manner than the 'old' systems.

"Once the data is at the central server it can be again 'pushed' to a variety of users or devices.....free of charge and instantly. One such system is marketed by Solus, which then merges the data with other content and makes it available on any screen with a Solus

interface fitted. The advantage of this is that every screen is under weblogger remote control and can be programmed remotely to change the content as required." Solus is already used by nine Scottish authorities.

"So for instance if there was another 'Buncefield', then screens in the area could be modified instantly to carry a special message. By mixing air quality data with other (perhaps more interesting) data it places air quality information in front of sections of the population who might otherwise not bother to seek it out."

Mills added: "It's all part of our campaign to make air quality data more accessible and to make it simpler for the man in the street to comprehend."

- www.airmonitors.co.uk

WASTE MANAGEMENT

Design guide launched for waste facilities

Guidance has been released on good design for waste facilities.

The new guidance, produced by Defra in partnership with the Commission for Architecture and the Built Environment (CABE), is aimed at all bodies involved in developing and building waste facilities, offering various approaches to

design.

The guidance covers the various types of waste facilities, from small community and municipal sites such as compost units on estates to larger sites such as combined heat and power facilities, and outlines key design principles, the design process, best practice in

design and how best to consult the public.

It focuses mostly on what the facility will look like rather than the technical aspects of mitigating the pollution and emissions from the development.

- www.defra.gov.uk/environment/waste/facilities.htm

CLEANER FUELS

£10m for 100 low emission vehicles

£10m of funding from the Technology Strategy Board will be used to launch 100 ultra low carbon demonstration vehicles to be on roads by end of 2009.

Additionally £20m has been promised to research the electrification of road transport, decarbonisation of road vehicles and academic-led research into new low carbon vehicle technology. This aims is to stimulate a mass market in electric and hybrid cars.

The three new competitions form part of the Low Carbon Vehicle Integrated Delivery

Programme. Launched in May 2007, the programme is the key delivery mechanism for the Government's research & development funding on low carbon vehicles.

To encourage the mass production of green vans, the Department for Transport said that 10 companies have been shortlisted to bid to provide electric and low carbon vans to some councils and other public sector bodies, like the Royal Mail, to help cut road transport emissions. Liverpool, Newcastle, Gateshead,

Coventry, Glasgow and Leeds will be among the first councils to trial green vans on their streets.

The 10 companies are: Ford; Mercedes Benz; Citroen; Ashwoods; Land Rover, Modex; Smiths; Electric Vehicles; LDV; Nissan and Allied Vehicles.

Transport secretary Geoff Hoon added: "Vans make up around 15% of road transport emissions in the UK, and their emissions are rising most."

- Further details available on the Technology Strategy Board website – www.innovateuk.org

ACTION PLANS

Renewable fears from Epuk

Air quality issues have not been covered sufficiently, Epuk says in its response to the Government's Renewable Energy Strategy consultation (*AQM August p5*).

Biomass forms the centre of Epuk's concerns. While Epuk supports production of emission standards for boilers, better controls for local authorities and MOT-style tests, it would like more research to investigate when and where biomass boilers represent a threat to air quality standards to help set appropriate uptake targets.

But despite the positives it adds that it still has areas of concern. These include:

- Insufficient consideration of binding European limit values – The consultation document repeatedly mentions 'minimising' the effect of biomass on air quality. "European air quality standards are legally binding in the same way as European renewable energy targets, and we are currently not on track to meet these air quality limit values in all parts of the UK. If all sectors only seek to 'minimise' effects, rather than actively improve, the UK will be infracted by the European Commission."

- No consideration of PM_{2.5} exposure reduction targets – urban exposure reduction targets for PM_{2.5} have now been set at both UK and EU levels, however there is no mention of these targets within the consultation document. "Modelling work needs to be undertaken to ascertain the effects of a large increase in biomass burning on the exposure reduction target, and, if it is deemed to be significant, how geographical targeting can minimise this."

- Lack of geographical targeting: "The text of the draft strategy is contradictory, stating in places that it may be best to target biomass deployment in rural areas and/or areas with no mains gas, and elsewhere conceding that these opportunities simply aren't big enough to meet the likely amount of biomass heat needed."
- "The document also fails to recognise that the vast majority of biomass heat deployment is currently development-driven, and that development is predominantly taking place in urban areas, many of which suffer from poor air quality."
- www.nsc.org.uk

Benn visits Epuk in Brighton



Environment minister Hilary Benn (pictured, left) has visited Epuk in Brighton.

Benn was introduced to Sussex Air's *AirAlert* air quality and health alerting system by Epuk staff in Brighton. Organisers report that Benn showed "genuine interest" in the service. "We hope he can flag it up within Defra in the future, especially linking in funding and support with primary care trusts and the NHS."

HEALTH EFFECTS

Fresh air walking for west London

West London is launching an internet site that suggests fresh air walking routes to encourage people to leave their cars at home.

The West London initiative, part funded by TfL, is based on the Walkit.com website service already in use in central London (*AQB March p6*). Launched in Richmond by the West London Air Quality Cluster Group, the online service enables people to plan their journeys along the least polluted routes in West London.

The cluster group comprises the boroughs of Richmond upon Thames, Hounslow, Hammersmith & Fulham, Brent, Ealing, Hillingdon and Harrow.

At the launch, Richmond Council said: "We very much



Walking on routes with fresher air

support any initiative that makes it easier for local people to use their feet to get from one place to another. It is well documented that being in areas with high air pollution can have severe health impacts.

"While the problem cannot

easily be solved, its effects can be avoided. This useful new service shows how solutions can be found through the collaboration of equally committed neighbours. We are all committed to encouraging residents to make healthier choices and this includes walking whenever possible. This website makes that choice practical."

Cluster group chairman Rob Gibson said: "This new facility allows people to walk away from air pollution, removing a barrier to this activity. From day one of the service there will be one less excuse why we shouldn't walk in West London."

- www.walkit.com/showcase
- www.westlondonairquality.org.uk

IN BRIEF

Biomass shift?

Allan Jones, appointed by former London Mayor Ken Livingstone to promote renewable energy on new developments through London Development Agency, has left his job.

During his tenure, London councils found themselves under pressure to approve biomass facilities in new developments despite potential air quality impacts (*AQB August p5*). The GLA is now understood to be pushing liquid biomass in new developments.

Motorcycles tested

DfT has just released a 2004 report assessing the performance and exhaust emissions for motorcycles over three different emission drive cycles.

- *Motorcycle exhaust emissions factors and test cycles programme: final report* can be viewed on www.dft.gov.uk/pgr/roads/environment/research/cqvcf/ricardomotorcycleemissions.pdf

US lead tightened

The US has tightened its standard on lead.

The EPA substantially strengthened the national ambient air quality standards (NAAQS) for lead by a factor of ten. The standard was 1.5µg/m³ and becomes 0.15µg/m³ measured as total suspended particles (TSP). As in the case of monitoring of particles in Europe, there is some argument about the chosen measurement standard which relies on a HiVol sampler.

This is tighter than the UK standard of 0.25µg/m³.

- www.epa.gov/air/lead/actions.html

Good practice

The review and assessment website has recently been updated with a number of good practice examples of Round 3 progress reports and detailed assessments.

Another Round 2 further assessment example has also been added

- More details on the review and assessment helpdesk website www.uwe.ac.uk/aqm/review

Omega tackles aviation emissions

Jack Pease reports from the Omega aviation and air quality conference held in London last month

Attending an aviation conference when used to the humdrum world of air quality is an enlightening experience.

At a typical Epuk or Iapsc air quality conference, it is taken as read that polluting activities are a Bad Thing and need to be controlled to cut pollution. Industry, retail and domestic developers have to show they can minimise their impact if they wish to operate a new facility.

Hitherto this has not been the case for aviation which assumes it will expand indefinitely. However the Government's pledge that an expanded Heathrow would have to keep to limits changed all that.

That pledge left the industry and the Government scrambling to prove that aviation is not dirty, and expansion will be okay. Or simply arguing that the limits are wrong.

This was certainly the feeling at the recent Omega conference held in London. While ostensibly an independent research group on aviation sustainability, the flavour is very much of a pro-aviation lobby group, not least because of the reported £5m of funding being channelled through Omega by the DfT rather than Defra.

Much of the work discussed at the conference was complicated, as evidenced by Air Quality Consultants' Steve Moorcroft apologising for the fact that his talk didn't include any complicated differential equations. Many talks did – prompted by the difficulties of modelling planes.

Planes, when stationary, are relatively easy to model, with emissions rising because of their heat and then dispersing. But the minute they are on the runway, things start to get very complicated as they are accelerating forwards and eventually upwards, with varying amounts of lift generated by the wings.

This lift – clearly very substantial if it is to keep a large plane aloft – has the effect of pushing twin packets of pollutant-rich air downwards. If the plane is on the ground, these emissions spread out, if the plane has left the ground, the twin packets are first pushed down then as they lose their speed, start to rise again being warmer than the surrounding air.

Mike Bennett of the Centre for Aviation and The Environment (CATE) in Manchester explained how these exhaust plumes disperse based on lidar measurements taken at Heathrow and other UK airports. The 'eye safe' (to avoid blinding pilots with lasers) Lidar fires a beam across the wake of a plane to map the pollution pockets. This reveals that a good deal of the pollution has subsided by the time it reaches the airport boundary.

Cerc's David Carruthers told the conference of broader air quality modelling used to underpin the Project for the Sustainable Development of Heathrow (PSDH). PSDH output is being used by the Government to show that Heathrow expansion can go ahead without breaching



Uncertainties still remain on APU emissions

air quality limits.

Carruthers did the modelling, which generated a series of contours above and below the critical $40\mu\text{g}/\text{m}^3$ objective threshold level. These have been reinterpreted by the DfT into 'numbers of households over the objective' which conveniently disappear to zero by 2030. This interpretation of the modelling has been widely criticised for failing to take into account uncertainty.

Models are notoriously uncertain and the DfT is only quoting numbers of households exposed above the limit value. Good practice and indeed the air quality strategy suggests that some caution should be used.

Thus if the $38\mu\text{g}/\text{m}^3$ contour was used, the numbers creep up, and significantly, do not drop to zero.

And there is a lot of uncertainty. The

WHAT IS OMEGA?

Omega is a publicly funded academic partnership unveiled in 2006 to offer relatively impartial input into the environmental effects of the air transport industry (*AQB June 2006 p3*). It was set up by the then DTI with £5m of funding.

A key aim is to transfer knowledge to those in the aviation sector and government who are responsible for regulating and delivering air transport. The Omega partnership includes a multi-disciplinary team with experts in environmental and social sciences, technology, business, economics, enviro-politics and global regulation. It is run by Manchester Metropolitan University with Cambridge and Cranfield: other partners are Leeds, Loughborough, Oxford, Reading, Sheffield and Southampton.

Omega projects include:

Characterising near-surface aircraft particulate emissions

The project aims to acquire a better understanding of the character of airport particulate emissions through the development of a low-cost portable instrument, not currently available commercially, to measure particles in a size range that relates directly to human health concerns. This will extend knowledge of particle composition from different airport sources and support work to improve modelling how emissions disperse.

Aviation emissions and their impact on air quality

Aircraft create strong but intermittent emissions, making it

difficult to tell how they affect the overall level of pollution in an area. This study includes a series of field measurements on an aircraft at Cranfield Aerodrome, in which engine emissions will be measured using a range of advanced techniques. The project will improve ways of characterising the dispersion of separating out emissions from aircraft engines and help to enhance modelling of impacts in the community.

Aircraft emissions plume analysis

This project will investigate the design of a probe for sampling engine exhaust, and sophisticated measurement equipment. Data derived from the project will enable better understanding of plume composition and dispersion and therefore its effect on air quality, helping to remove uncertainty that is hampering the development of effective local mitigation policies.

Understanding initial dispersion of engine emissions

This study aims to examine dispersion performance, gas and particle emissions from aircraft engines in a dynamic take off environment. Whilst focused mainly towards near-airport pollution effects the study will also consider the transition of engine exhausts 'efflux' into a mixed plume for other phases of flights. The findings will give insights into the way aviation emissions disperse, enabling better analysis of pollution levels.

Omega conference focused on aircraft engine emission patterns due to the historical lack of data on real world emissions. The latest thinking confirms that aircraft are not large PM₁₀ emitters, and that NO_x and NO₂ are not as bad as might be expected. But it is still true that little is known about APUs (auxiliary power units mounted on planes to generate power while main engines are turned off) and other airside activities.

Modelling also appears to reflect popular assumptions that vehicle emissions of NO_x and NO₂ will come down. Leeds University's David Carslaw noted that there was now ample evidence that increases in primary NO₂ were among the reasons why NO₂ concentrations were not coming down as expected – but that there was emerging evidence that modern vehicles could be producing not just more NO₂ than expected – but also more NO_x.

The Government's (and BAA's) entire case for being able to 'fit' expansion in at Heathrow is based on using the 'headroom' created by the reduction of vehicle emissions to allow increase in airplane emissions. If it is true that new vehicles are not as clean as emission factors predict, then assumptions about numbers of properties affected will be optimistic.

Carslaw said: "NO_x controls on diesels have been lacking and not until Euro 6 standards come in will we see any NO_x targeted. In the meantime we have got an NO₂ problem that we will be stuck with for a decade."

Discussions such as these prompt a certain degree of frustration among diehard aviation researchers. The point was made, more than once, that having to meet the NO₂ objective near Heathrow is unfair to the industry as the NO₂ standard itself was unsound.

Cambridge University's Rex Britter pointed out that US NO₂ standards were double that of Britain – and if the US standards were applied to Heathrow, there would be no pollution problem. And discussion turned to the fact that in terms of cost benefit analysis, there is virtually no cost benefit in tackling NO₂, while there is a huge benefit in reducing PM₁₀ and ozone.

If the aviation interests are hoping for a relaxation of the European NO₂ directive, they are several years out of touch with latest thinking. A few years ago the WHO revisited the basis for setting 40µg/m³ as the NO₂ annual mean objective limit precisely because there was a feeling it was unnecessarily tight – and reconfirmed that there was ample medical evidence to retain the standard.

It was then the turn for the DfT's Martin Capstick to give the Government's view. Civil servants are masters at saying very little and Capstick said even less than that, although he has a good excuse given the political interest in the looming announcement of the Heathrow decision.

With such a disappointingly guarded talk, this leaves delegates reading between the lines.

Capstick's presentation contained two curious points, being a civil servant it is unlikely they were included by accident.

Given that this man is not an air quality specialist, why did he focus so much on the European air quality directive's definition of 'exempted' areas? We know that the directive clarifies that the objectives only apply where the public have regular access, and that areas such as central reservations on dual carriageway roads are exempt. But why flag this up?

A delegate was also intrigued: "So will Heathrow be exempt from the directive?" Capstick replied cryptically: "That's a very good question indeed," then duly refused to answer it.

Could it be that having organised that dispersion modelling leaves no houses over the objective limits, legal questions have arisen on which parts of the central Heathrow area need to comply with directive? Even millions of pounds thrown at ADMS dispersion modelling will struggle to manipulate the results to show that this central area could ever meet the 40µg/m³ objective limit. So is the DfT trying to get it's lawyers to decide that the objective shouldn't apply there?

What we have here is the 'Paddington' problem (or indeed the Paisley problem). Westminster has been flagging up Paddington Station because it is semi open and laced with diesel fumes. There is certainly public exposure, and Westminster has long sought clarification that the platforms are really exempt from air quality regulations (*AQB December 2006 p2*).

Likewise in Paisley, Renfrewshire wanted to know whether a bus station under a road 'bridge' supporting a shopping centre was subject to air quality laws.

These case studies are entirely relevant for the Heathrow central area which

includes bus stations, car parks, roads and pavements – all of which the public can expect to be present for reasonably long periods. The lawyers will have fun, and it is no surprise that Capstick would not be drawn on what the answer is.

Capstick isn't entirely uncritical of the aviation industry. He admitted that when he arrived in the post, he was "surprised" to find that aircraft emissions standards (CAEP standards) "tend not to be technology forcing". What he means here is that international standard-setting body ICAO has consistently backed away from setting emission standards that stretch engine makers.

For road vehicles, legislators set standards that make the engine makers squeal in protest that they are unachievable. They are always achieved, often with improved fuel consumption to boot.

Aero engine standards tend to be set at the standard already in production requiring little if any effort by engine makers to improve them. Capstick said that in 2010 a new CAEP standard is due to be agreed which should include NO_x reductions.

But NO_x is an awkward pollutant. Engine makers are under obvious pressure to improve fuel consumption, and just as automotive engines become more efficient with higher injection pressures, so aero engines become more efficient with higher pressure ratios.

Whereas vehicle emission limits are absolute – ie a single NO_x emission number that has to be achieved whatever the efficiency of the engine – aero engines have a curve such that higher efficiency, high pressure ratio engines are allowed to have higher NO_x emissions.

Capstick said: "I am slightly nervous that as engine makers take advantage of the benefits of increased pressure ratios, the resulting improved combustion will ostensibly be cleaner than the new standard but actually lead to more NO_x emissions."

Stewart leads environmental top 100



Aviation and transport campaigner John Stewart has been voted number one in *The Independent's* Top 100 list of environmentalists. Stewart has been instrumental in highlighting the air quality and noise impacts of the proposed expansion of Heathrow Airport.

The Independent says: "The little-known John Stewart, who leads the onslaught against a third runway at Heathrow, soundly beats far more high-profile figures – from Jonathon Porritt to Zac Goldsmith, from Sir David Attenborough to Prince Charles – to take the honour. He does so in the wake of an important breakthrough for his campaign – the announcement by the Conservative Party that it plans to scrap the runway in favour of high-speed rail links that would supplant short-haul flights."

Also included in the top 100 are Professor Robert Watson, the chief scientist at Defra; Jane Davidson, the Welsh environment minister; Ken Livingstone, former Environment Agency chief executive Barbara Young, former environment minister Michael Meacher and Stephen Holgate of Southampton University (and head of the Expert Panel on Air Quality Standards).

SCIENCE SHORTS

Ozone goes east

UK researchers have tried to estimate the impact of worldwide emissions on European surface ozone.

Researchers said: "NO_x emissions from lower latitudes, especially in summer, were found to decrease European ozone, when both the short- and long-term responses were considered. It has been possible to begin the process of examining the likely influences on ozone levels across Europe resulting from precursor emission controls in North America and Asia and, in turn, their possible impacts on meeting ozone air quality targets over Europe."

How is surface ozone in Europe linked to Asian and North American NO_x emissions? Dick Derwent et al, *Atmospheric Environment* Vol. 42 (2008) pp7412-7422.

Inflammation worsens

Long term exposure to particle pollution can increase white blood cell counts – a measure of inflammation.

US researchers, including Joel Schwartz, suggest that long term particle exposure worsens blood markers and makes subjects more susceptible to short term pollution effects.

Researchers say: "Our study results demonstrated that haematological inflammatory markers of increased cardiovascular disease risk, as reflected by increased white blood cell count, were associated with long term (one year) PM₁₀ exposure. This provides the first epidemiologic data linking inflammatory biomarkers to long term particle exposure.

"The observed increasing inflammatory response across subpopulations with more (blood system) abnormalities supports the concept of (blood system)-dependent susceptibility to particle related long term cardiovascular effects."

Metabolic syndrome and inflammatory responses to long term particulate air pollutants, Jiu-Chiuan Chen and Joel Schwartz, *Environmental Health Perspectives*, Vol. 116, No 5, May 2008 pp612-617.

VEHICLE EMISSIONS

Exhaust purges may be missed

Emissions from modern vehicles using regenerating exhaust systems may be underestimated.

Modern emission control systems can use a system where NO₂ or particles are cleared out in a special cleaning cycle. This happens irregularly depending on driving style, and because of this it is hard to include the emissions during testing.

Swiss researchers tested four different Euro 4 cars featuring different regeneration after treatment system. Researchers say: "During our experiments, the two NO_x storage catalytic

converters installed in different cars showed very short regeneration intervals so that the resulting extra emissions are included in the emission levels determined in usual testing with standardised drive cycles. Overall, NO_x emissions are successfully lowered."

The story was different with three different diesel cars which showed varying frequencies of regeneration with considerable and pronounced peak emissions during regeneration. As regenerations occur randomly, and are not included in European tests as yet, emissions

can be miscalculated.

"To determine real world emission factors for cars using regenerating after treatment systems, either the number of measured driving cycles or the number of cars to be measured has to be increased in order to take into account the variations in regeneration frequencies."

Pollutant emissions from vehicles with regenerating after-treatment systems in regulatory and real-world cycles, Robert Alvarez et al, *Science of the Total Environment* Vol. 398 (2008) pp87-95.

BIOMASS

Wood smoke significant polluter in Europe

In Northern Europe, wood-burning to heat homes in residential areas may be the main source of air pollutants. Researchers say restricting wood burning could reduce public health risks and help meet the requirements of the EU objectives.

Finnish researchers have now identified the exact compounds released by wood combustion, and have measured the proportion of pollutants in the air produced by burning wood.

Measurements were taken during winter in a residential area of Finland, selected for its isolation from other major

sources of air pollution, such as main roads and local power stations. Modelling techniques were used to match the chemical profile of pollutants to their source.

The main sources of the pollutants were found to be from wood burning and traffic emissions, but wood smoke was the biggest contributor of many organic compounds, including benzene, ethene and ethyne. Up to 70% of benzene detected in the air was from wood smoke.

When weather conditions, such as the wind speed and direction, were favourable, brief surges in the concentration of

some organic pollutants were detected. Fluctuation of levels of benzene in the air also occurred in the same daily pattern as the levels of wood use.

The association between the levels of fine PM_{2.5} and PM₁₀, and wood combustion in this study was less definite. But the study suggested that peaks detected in the levels of particles were linked to the increase of local wood burning.

Influence of residential wood combustion on local air quality, H Hellén et al *Science of the Total Environment* (2008), 393 (2-3): 283- 290.

INFORMATION

AQ warnings not reaching the public

Researchers in Oregon and Texas believe that air pollution and heatwave messages are not getting through to the public.

In the UK there is a growing number of systems designed to warn vulnerable persons of poor air quality (such as Sussex's *Airalert* system) and organisers have spent considerable time to see whether the warnings are proving useful.

In the American research, air quality and weather conditions were measured during warning days and control days in Portland and Houston. 1962

subjects were interviewed by telephone about their perception and response to such conditions.

The public were found to be well aware of heatwaves however in Portland residents modified the behaviour by using fans and air conditioning while in Houston this wasn't the case. More heat related symptoms were reported in Portland where there is less air conditioning use.

One third of the participants were aware of air quality warnings but only 10-15% claimed to have changed their

activities as a result of the warnings.

Researchers say: "Messages are not reaching the public during potentially hazardous weather and air quality conditions. Climatic forecasts are increasingly predictive but public agencies fail to mount an appropriate outreach response."

Public perception and behaviour change in relationship to hot weather and air pollution, Jan Semenza et al, *Environmental Research* Vol. 107 (2008) pp401-411.

SCIENCE SHORTS

BUILDINGS

Building filtration: is it worth it?

A study has looked at whether it is cost effective to use filters to clean ambient air coming into buildings.

Danish researchers looked at the cost of installing and maintaining filtered air in office premises and the benefits in terms of reduced illness and death. The negative impact of stale air generated when filters are not changed was also taken into account.

Researchers concluded: "The study indicates the overall benefits of using particle air filtration in office buildings are several times larger than the associated running costs.

Substantial savings are obtained from decreased occupant morbidity and mortality (resulting from reduced exposure to particles of outdoor origin) as well as from less frequent building cleaning.

"However the size of the net benefits varies with the view of the stakeholder and the valuation approach. For society as a whole, a major portion of the benefits derives from reduced occupational sickness and death. For both building owners and society, savings related to less frequent building cleaning are substantial.

"The employer obtains

significant economic benefits mainly from the reduced number of days of work lost related to the adverse health impacts of particles. However the benefits may be easily overwhelmed by even a small decrease in occupant productivity as a consequence of odours from used particle filters."

Is the use of filtration justified? Costs and benefits of filtration with regard to health effects, building cleaning and occupant productivity, Gabriel Beko et al, *Building and Environment* Vol. 43 (2008) pp1647-1657.

OZONE

Ozone leads to vitamin D deficiency

Ground level ozone pollution can lead to vitamin D deficiency, Belgian researchers believe.

Study subjects were post-menopausal women who had visited their doctors about shoulder or back problems and who engaged in outdoor activities either in Brussels or the surrounding countryside. There were 47 rural residents in the study, and 38 urban residents.

When compared with rural inhabitants, urban inhabitants were exposed to differing levels

of ozone pollution and following adjustment for sun exposure, vitamin D deficiency markers were different in rural residents as compared to urban residents.

Researchers explained: "Sunlight is an important source of vitamin D but from November to March at latitudes above 35° N, very little, if any, vitamin D is produced in human skin during exposure to sunlight. Therefore, during June and July in Belgium, we were surprised to find that 50 of 85 post-menopausal women (59%)

had vitamin D deficiency."

The researchers added that air pollution may be a neglected risk factor for hypovitaminosis D, which is known to compromise several health outcomes.

Urban tropospheric ozone increases the prevalence of vitamin D deficiency among Belgian postmenopausal women with outdoor activities during summer, Daniel-Henri Manicourt et al, *J Clinical Endocrinology Metabolism*, October 2008, 93(10):3893-3899.

INVENTORIES

Greeks predict future emissions in Europe

Greek researchers have used emission inventories to estimate European vehicle emissions up to 2020.

Modelling was used to estimate the exhaust emissions of NO_x, NO₂ and PM_{2.5}. Non-exhaust (tyre and break wear) PM_{2.5} and PM₁₀ were also calculated. Emissions were projected following current legislation measures and a scenario representing maximum feasible technical reductions (MFR). Projections to 2020 showed that current legislation will bring 89, 25 and 50% reductions in NO_x from petrol

cars, diesel cars and heavy goods vehicles, respectively, over 2000 levels, when comparing average emissions on a per vehicle-km basis.

The corresponding reductions in the maximum feasible reductions scenario were 91, 53 and 67%, respectively.

Researchers say: "Despite these significant reductions, NO₂ emissions do not seem to be effectively controlled for diesel cars due to the increased NO₂/NO_x ratio of new and expected after treatment systems. Moreover, there is an almost 9-fold increase of NO₂

emissions from mopeds, as they gradually shift to stoichiometric mixtures, four-stroke combustion and use of catalysts in the exhaust. However, the increasing share of non-exhaust sources to the total particle emissions may hamper the effectiveness of exhaust control measures in meeting future urban air-quality standards."

Road transport emission projections to 2020 in European urban environments, Marina Kousoulidou et al, *Atmospheric Environment* Vol. 42 (2008) pp7465-7475.

Green roofs: do they cut pollution?

US researchers have tried to find out whether 'green' roofs (eg grass) can effectively cut pollution.

Using a dry deposition model, it was calculated that 1675kg of air pollutants was removed by 20ha of green roofs in one year, with ozone accounting for 52%, NO₂ 27%, PM₁₀ 14% and sulphur dioxide 7%. The highest pollution removal came in May while the lowest was in February.

Researchers said: "The amount of pollutants removed would increase to 2046 tonnes if all rooftops in Chicago were covered with intensive green roofs. Although costly, the installation of green roofs could be justified in the long run if the environmental benefits were considered. The green roof can be used to supplement the use of urban trees in air pollution control especially in situations where land and public funds are not readily available."

Quantifying air pollution removal by green roofs in Chicago, Jun Yang et al, *Atmospheric Environment*, Vol. 42 (2008) pp7266-7373.

Sheffield metals

Heavy metals have been studied on a busy Sheffield roundabout.

Researchers were keen to see the concentrations and fate of deposited heavy metals such as platinum, palladium and rhodium from exhaust catalysts.

Dispersion and accumulation of Pt, Pd and Rh derived from a roundabout in Sheffield: from stream to estuary, H Prichard et al, *Science of the Total Environment*, Vol. 401 (2008) pp90-99.

Ozone hits 11yr olds

A study in New York has looked at the impact of ozone on children over the age of 11. A link between respiratory hospital symptoms and ambient ozone two days previously was found.

Ambient ozone concentrations and hospital admissions due to childhood respiratory diseases in New York state, 199102991, Shao Lin et al, *Environmental Research* Vol. 108 (2008) pp42-47.

So Defra is scrabbling around trying to get local authorities to rustle up measures that they have taken to improve PM₁₀.

The whole exercise is a little bizarre as Defra is claiming that there is only one area of PM₁₀ exceedences in the UK (roadside, London) leaving many local authorities who have monitored PM exceedences scratching their head as to why their exceedences don't count.

Boroughs report that they have been asked by Defra to fill in a curious questionnaire that looks as though its been put together by a 16 year old work experience student attached to the air quality team. Boroughs are asked, among other things, for evidence they have considered "appropriate measures" such as:

- Effective reduction of speed limits and control;
- Effective improvement of public transport;
- Low emission fuels;
- Introduction/increase of environment taxes.

And so on. Hmmm. This is for *local* government? We think the Treasury might have interesting things to say if local councils introduced environment taxes,

taxed fuels or funded public transport in a big way.

Actually we think the list could well have been Defra's early draft of its air quality strategy – the strategy that actually had some action in it before the Treasury got its red pen out and struck out anything that involved action.

And it's a bit cheeky for Defra, having refused to fund many of these measures, to now expect councils to happily hand them the benefits on a plate.

The Omega aviation and air quality conference held in London last month gave us interesting access to academic aviation researchers. These were a different breed to the usual environmental health crowd.

Such practical types' might chuckle at the MMU's Mike Bennett who described the way to model jet engines on a taxiing plane is to "treat it as a chimney on the side". Ouch, this is not the image the aviation industry would like to portray.

But he redeemed himself somewhat by admitting that most jet engines were so clean that Lidar monitoring equipment found it hard to pick up the plumes. Unless there's an oil leak leading to more smoke: "Sometimes oil leaks can be

helpful," explained Bennett.

And then Professor Rex Britter described Heathrow as an ozone hole. On the face of it, that's a compliment – sort of.

A robust discussion sprang up between plane emissions modeller Angus Graham and air quality's own ADMS boffin David Carruthers of Cerc.

Those who have seen Carruthers present at conferences will know of his unstoppable excitement on all things to do with air quality modelling, especially his beloved ADMS.

So when Angus Graham pushed Carruthers with the assertion that ADMS really should model plane-by-plane, real time emissions, Carruthers cautioned him "not to get too excited by the physics of it".

Could it be that Carruthers has met someone even more passionate than himself about air quality modelling?

Incoming environment minister Lord Hunt's first utterance on air quality does not bode well for the future.

He told the Lords: "Some particles can be really small." With insight like that, things can only get better.

AIR QUALITY EVENTS 2008

13th November

ADMS-URBAN AND ROADS USER GROUP MEETING

to be held in Regent's Wharf, London. www.cerc.co.uk

25th November

ADMS 4 USER GROUP MEETING

to be held in York. Further details www.cerc.co.uk

2nd December

DISPERSION MODEL USERS GROUP

Air quality modelling of congested traffic and effective road traffic improvements, DMUG conference to be held at the Royal Geographical Society, London www.environmental-protection.org.uk

11th December

IAPSC

Investigation of Air Pollution Standing Conference to be held at Austin Court, Birmingham [website www.iapsc.org.uk](http://www.iapsc.org.uk)

16/17th December

MONITORING AMBIENT AIR 2008: SPECIATION AND AMBIENT

air quality, RSC AAMG conference to be held in London, [website http://rsc-aamg.org/Pages/Meetings.html](http://rsc-aamg.org/Pages/Meetings.html)

2009

24th-27th March 2009

7TH INTERNATIONAL CONFERENCE ON AIR QUALITY

Science and Application (Air Quality 2009) (formerly known as the Urban Air Quality Conference) to be held in Istanbul. For more information, visit the website www.airqualityconference.org

2nd-3rd April 2009

AIR QUALITY SPRING WORKSHOP

Epubk air quality spring workshop to be held in Highgate House, Northampton. www.environmental-protection.org.uk
Lucy Salter 01273 878776

20th-21st April 2009

2009 INDOOR AND OUTDOOR AIR POLLUTION RESEARCH

Meeting to be held at Cranfield, www.le.ac.uk/ieh

29th-30th April 2009

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)

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Printed and published
by Environmental
Management Publishing Ltd

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