

AIR QUALITY

December 2007 Issue 20

BULLETIN

AVIATION

Heathrow: pollution cleared

Consultation has started for a third runway and sixth terminal at Heathrow. It will allow a near-doubling of traffic.

Air quality is a key issue in the consultation which can go ahead now the Government believes that air pollution limits can be met. Heathrow and the traffic that serves it cause significant air quality exceedances and the Government pledged in 2003 that it would not agree to expansion if air quality (and indeed noise) worsened.

It commissioned the comprehensive and expensive (£2m) Project for the Sustainable Development of Heathrow to agree revised modelling techniques to show that air quality would not be problem. The consultation says that just 22 houses will be left above NO₂ limits in 2015 – and there will be no exceedances in 2020. This compliance occurs because of the gradual improvement of vehicle

emissions as a result of tightening Euro standards.

The consultation is very clear that no further policy measures (beyond those already in place or agreed) will be necessary to meet air quality limits in 2020, either on the airport or on the local road network. It had been thought that measures such as road pricing would be needed on local motorways, and at one point there was even talk of having to put the M4 motorway in a tunnel.

The proposals under consultation are:

- A third runway and sixth terminal sandwiched between current runways and the M4;
- Adoption of mixed mode operations, which will end the runway alternation which constrains capacity but gives timetabled noise relief to communities under the flightpaths;
- Other airspace changes such as abolishing the Cranfield agreement.

Analysis released with the consultation justifies the view that expansion will not worsen air quality or noise, but will worsen CO₂ emissions. By contrast there are the claimed benefits to the UK economy of increasing passenger numbers and reducing delays at the UK's main airport.

These are assigned cash benefits of £17bn against the 'cost' of air quality and noise combined of just £0.3bn, and climate change costs of £4.8bn. Air quality and noise costs are tiny as there is claimed to be little if any adverse effect.

Objectors are enraged: John Stewart, HACAN chair said, "Ruth Kelly is in wonderland if she thinks that all this expansion can take place and noise levels will be lower and only 22 homes will be affected by illegal air pollution levels."

- More details: see page 6
- The consultation can be viewed on www.dft.gov.uk/heathrowconsultation

Indicator detailed

198 national indicators have now been agreed replacing 1,200 existing indicators. The detailed content of the new indicators have now been released for consultation.

The indicators were announced in the public spending review and include air quality and climate change (AQB Nov p2). The Government claims the reduction will reduce red tape.

Following this month's consultation on the indicators, they will be finalised in "early" 2008 and come into effect on 1st April. The indicators will be the basis for negotiating new Local Area Agreements (LAAs) with local authorities and their partners.

The air quality measure:

Indicator NI 194 is called: *Level of air quality – reduction in NO_x and primary PM₁₀ emissions through local authority's estate and operations*. Defra commissioned research on this (and the CO₂ indicator, see below) and has now released a 'toolkit' which includes a spreadsheet that allows local authorities to easily tot up their emissions.

Primary particles are defined as those emitted directly into the environment. This includes particles from both natural sources, such as the entrainment of soils by the wind and man-made sources, and particles arising directly from processes such as combustion (stationary and mobile) and quarrying.

'Estate' includes buildings owned/rented by the local authority and relevant partners, including: council offices, social housing, libraries, community halls, streetlights etc. 'Operations' include outsourced services eg. waste collection, and 'vehicles' includes those owned or rented by the local authority or relevant partners/outsourced service providers, including cars, vans, buses/coaches/

● continued on page 2

MITIGATION

Homes completed despite no-kids plea



Homes are now being completed near the Rugby cement works.

At the time of the planning application for the affordable homes, Rugby Cement said that the proximity of the housing to a goods yard would cause noise and dust nuisance which "should not be confused with potential emissions from the cement works". Because of air quality concerns, it added: "It would be highly inadvisable to encourage these dwelling units to be occupied by families with young children as a result of providing second bedrooms."

It added that planning conditions should also require forced ventilation.

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OPINION

Is heat the new air quality?

Air quality folk are more and more becoming involved in climate change. After all, if not them, who? And so it was that APRIL (Air Pollution Research In London) met last month to discuss climate change at Imperial's swanky new Grantham climate change centre.

One issue that arose was heat. We know that climate change is making the UK warmer, and some recent summers have been dangerously hot. London and other cities exhibit a 'heat island' effect and in the recent heatwave, central London was 11 deg C warmer than the suburbs.

Rather like some air quality pollutants, heat has a threshold effect on health. Human beings can take a reasonable amount of excess heat, but once a certain threshold is breached, about 35 deg C, and there is insufficient cooling at nights, then people start to die. And so it was in 2003.

Bear in mind that air quality legislation was born out of the need to prevent episodes such as this and have ended up with a system that tackles hotspots based on air quality management areas.

So why not the same with heat? Like air pollutants, there are identifiable areas prone to get too hot, and identifiable susceptible groups.

Like air quality, the weather is to blame and heat events can be forecasted. Unlike air quality, the long term trend for heat is up – and the threshold for death will be increasingly breached. And unlike air quality, there appears to be no regulation of heat sources in urban areas, whether that be portable domestic air conditioning equipment or large scale biomass plants.

It may be wise to consider managing heat through a system of action areas. Heat action areas could involve powers to ban ad hoc air conditioning systems, and prevent the apparent absurdity of encouraging commercial biomass plants in areas with most heat stress.

● Jack Pease

POLLUTION EVENTS

Buncefield lessons ignored?

A fire at the Olympics building site in the east end of London produced a plume of black smoke reminiscent of Buncefield last month. ERG says more needs to be done to tighten up air quality responses to such incidents.

There was sufficient smoke to make an impact on the London monitoring network, ERG reports. Elevated PM₁₀ particulate concentrations were measured in Eltham and Falconwood. Peak PM₁₀ concentrations at both sites were close to 75µg/m³ at lunchtime on the day of the incident. Eyewitnesses saw the plume grounding.

There was evidence that PM₁₀

particulate from the fire spread into north east Kent during the early evening. Elevated concentrations of PM₁₀ were measured at the Sevenoaks background site where concentrations hit 91µg/m³ at 6pm. The Kent Air Quality Monitoring Network reported elevated PM₁₀ concentrations across Dartford and Maidstone.

The plume appeared to be entirely composed of PM_{2.5}. ERG's Gary Fuller adds, "As soon as we were informed of the fire, incident procedures were enacted in our operations centre that included rapid measurement analysis and increased data collection frequencies. Email data feeds

were quickly established to both the Health Protection Agency and to Defra.

"The events highlight the important role that the London and other regional air quality networks can play in the assessment of pollution impacts from large fires and similar major incidents. We learned a great deal from Buncefield incident during 2005 and a joint exercise with the HPA during 2006, but there is still an urgent need to formalise the current ad hoc arrangements so that relevant air pollution information can be rapidly supplied to those responsible for incident management and health assessment."

POLLUTION EVENTS

London hit by two further pollution episodes

Moderate and high air pollution was recorded in London on the 15th to 17th November.

ERG says that excepting bonfire night, this was the first primary pollution incident of the winter with 32 Teom sites, including sites in both roadside and background locations, recording moderate PM₁₀. Four sites measured high.

The EU daily mean limit value concentration was exceeded at 105 PM₁₀ monitoring sites over south east England. NO₂ was also high, with moderate recorded at five kerbside and roadside sites

during the rush hour on Friday evening. The EU limit value concentration of 200µg/m³ was exceeded at 38 sites. The hourly mean air quality strategy objective for nitrogen dioxide of not more than 18 hours per year above 200µg/m³ was breached at two sites, Marylebone Road and Lambeth, on the basis of measurements during this episode alone.

For bonfire night, ERG noted widespread moderate PM₁₀ particulate air pollution was measured across south east England on the 5th November. This was due to a combination

of Guy Fawkes events, traffic emissions and poor pollutant dispersion.

Very high PM₁₀ was measured at three sites – Brent, Greenwich, Barking & Dagenham and at Lewes. High PM₁₀ was measured at eight sites in London and 44 monitoring sites recorded moderate concentrations.

Over the last ten years Guy Fawkes events caused very high PM₁₀ in London during 1997, 2001, 2002 and 2006, with episodes in 2001 and 2006 being the most severe.

● www.londonair.org.uk

...CONTINUED FROM P1

AQ and climate change indicators (cont. from p1)

minibuses, refuse vehicles, delivery vans, ambulances, tractors, ride-on lawnmowers, etc., and staff commuting.

Defra says: "The air quality performance indicator targets the local authority area, and focuses on emissions of primary PM₁₀ and NO_x from local authority estates and operations. The indicator will not only target these two pollutants that are often the most prevalent, but will also mean that local authorities will lead by example. Furthermore, improvement targets will include local strategic partners, involving a wide range of

emission sources across an authority's area."

Climate change

There are two climate change indicators: NI 185 CO₂ reduction from local authority operations & NI 186 Per capita reduction of CO₂ emissions in the local authority area.

Defra commissioned two research projects, the first examined the sources of emissions which could be included in an indicator to monitor emission reductions, the levels of uncertainties in the current statistics on council emission estimates and provided estimates of CO₂

savings which councils could hope to achieve by 2010/2020.

The second analysed methods to measure carbon footprints along with air quality indicator pollutants (see above).

● *Analysis to support climate change indicators for local authorities, Analysis of methods to measure the carbon footprint and NO_x and PM₁₀ emissions of local authorities and other public sector bodies, Tool for calculation of CO₂ emissions from organisations and other resources can be viewed on www.defra.gov.uk/environment/localgovindicators/cc-indicators.htm*

MICROGENERATION

Biomass balance is tricky

Biomass has its place, however there may be "significant" impacts on air quality, a study is likely to say.

London Councils commissioned consultant AEA to look at the air quality impact of biomass in response to fears that GLA planning policies to encourage microgeneration would ignore air quality concerns (*AQB June p2*). Elsewhere there are cities, such as Dundee, where multiple applications for commercial biomass boilers, often based on woodchip combustion, are being proposed in areas of relatively high pollution.

AEA's report is in draft form and has caused a stir because it suggests that widespread take-up of biomass could worsen PM₁₀ concentrations by (*AQB* understands) up to 14µg/m³ – easily enough to force widespread breaches of the objective.

Peter Coleman of AEA outlined the report to delegates at EPUK's (formerly NSCA) microgeneration meeting held in Manchester last month. It contains a toolkit to help regulators decide which

biomass installations come under the Clean Air Act, Local Authority Part B regulation, or Environment Agency regulation. EHO's are also supposed to approve chimney heights, although guidance is not appropriate for wood burners.

Coleman showed calculations that could be used to estimate the density of domestic biomass installations that would prompt excess PM_{2.5} concentrations.

He concluded: "Biomass offers many advantages as a source of energy. However the range of emissions, especially from particles, is significant.

"Inappropriate biomass use may significantly impact on air quality, however developers and local authorities can achieve acceptable gains in sustainability without degrading air quality significantly."

Editor's comment: *This report is proving to be something of a hornets nest.*

National government, the GLA and the planning system are all hell-bent on steamrolling more biomass and environmental health

officers with responsibility for air quality are worried that carbon savings will be pursued whatever the cost to air quality.

By contrast there are climate change enthusiasts who fear AEA's report will discourage use of biomass. Inevitably between the current draft and final report stage there will be pressure to suppress or dilute some of the report's stark findings.

That could be a disaster – common sense suggests that any encouragement of combustion in urban areas with poor air quality is short sighted. For now, a precautionary start could be to ensure that biomass is encouraged outside of air quality sensitive zones. If the new facilities prove to be as clean as promised, then they can then be encouraged in more polluted urban areas.

It's about balancing air quality and climate change costs and benefits – just the sort of common sense that the Air Quality Expert Group tried to point out in the 300 pages of its air quality and climate change report.

OVERSEAS BEST PRACTICE

Tackling local air quality in the US

The US Environmental Protection Agency's Jeff Clark told a recent EPUK conference of initiatives taking place in the US.

Clark explained that states were encouraged to take action on air quality through the use of standards, which if breached, lead to the state being branded a 'non attainment' area. Even 'upwind' states can be required to control emissions for downwind states.

The stakes are high for those branded non attainment areas – capital road budgets are withheld and limits are put on inward development. "Thus local mayors take a very close interest in whether their areas pass or fail air quality standards as not meeting them will have very real local implications. The sanctions are a powerful tool, much more than just a paper

exercise and have cachet far higher than they might suggest," said Clark.

Initiatives being used by non attaining states include:

- Close adherence to an EPA green vehicle guide (www.epa.gov/greenvehicles) This ranks global warming and air quality impacts of all vehicles on a scale to allow buyers to find the greenest vehicle among a particular size range;
- Enviroflash is a scheme that transmits (for example by phone or text) air quality forecasts or action day notices to subscribers, allowing subscribers to make choices to avoid exposure and emissions;
- As part of a clean diesel campaign, truckstops are being fitted with electricity points to allow truckers, during their overnight stop, to plug in air conditioning and refrigeration

equipment to the mains, rather than running their engines all night;

- A clean school bus programme incentivises operators to replace old buses, and retrofit high emission engines. Clark says: "24 million children ride school buses every day spending an average of 90minutes on the bus.";
- A wood stove replacement programme aims to reduce the 420,000 tons of PM_{2.5} emitted by residential wood burners every year. Clark says: "Changing one old inefficient stove is equivalent to taking five old diesel buses off the road.";
- Clark also runs a 'best workplaces for commuters' programme. This provides national recognition for employers that meet 'excellence in commuting' benefits reducing environmental impacts.

IN BRIEF

Air appeal fails

Sevenoaks District Council has withdrawn its objections to an extension of a Tesco superstore.

Air quality and noise were among the objections raised by the council, it claimed that increased traffic would worsen the situation for properties in an air quality management area (*AQB March p1*). Elected members still oppose the store, but following legal advice, have decided not to pursue its objections at appeal.

Euro VI outlined

Euro VI commercial vehicle emission limits have been set out in discussions between the motor industry and the European Commission.

The new standard aims to reduce NO_x by a further 80% and particulate matter by 50% compared to the current standards. The new Euro VI levels proposed by the industry will reduce NO_x and particulate matter emissions by 95 and 98% respectively, compared to the levels at the time of Euro I.

Cattle probe

Defra is letting research on the identification and mitigation of the environmental impacts of out-wintering beef and dairy cattle.

● www.defra.gov.uk/science/funding/competitions.htm

Smoke exposure falls

Cancer Research UK says hospitality workers' exposure to smoke particles has fallen by 95% since the smoking ban came into effect.

The researchers assessed air quality in almost 40 venues across the country – including pubs, bars and restaurants. On average, PM_{2.5} levels reduced from 217µg/m³ in June to 11µg/m³ in August – a reduction of 206µg/m³ or 95%, bringing indoor levels down to similar levels seen outside.

They calculated that on average, employees' exposure was the equivalent to smoking 190 cigarettes a year before the legislation, and this dropped to the equivalent of around 44 cigarettes after.

IN BRIEF

Biomassive plant

A 350MW wood-chipped fuelled electricity generating plant in Port Talbot has been approved. When completed at the turn of the decade, the £400m plant from developer Prenergy, will contribute around 70% of the Welsh Assembly's 2010 renewable electricity target. Biomass will be imported from North America.

Port Talbot already has an air quality management area prompted by the Corus Steelworks.

Renewables push

A new report from the Renewables Advisory Board (RAB), which advises Government on renewable energy, analyses the role of on-site energy generation for the Government's policy of ensuring that all new homes are zero carbon from 2016.

It says that technologies that are likely to experience the highest levels of uptake are biomass combined heat and power and solar photovoltaics. The report urges use of the planning system to require zero carbon standards in the largest housing developments in advance of 2016.

Vans targeted

Low Carbon Vehicle Procurement Programme money will be targeted at greening vans.

The £20m programme exists to encourage innovative, low-carbon vehicles for use in public sector fleets. The majority of programme funding in the initial phase will be on the procurement of a lower-carbon van, as there is currently no lower-carbon van model available on the mass UK market, despite the fact that technology options exist for improving the carbon performance of vans.

Money will also be made available for all-electric vans, a lower-carbon minibus, and potentially a small demonstration fleet of plug-in hybrid passenger cars.

● www.dft.gov.uk/pgr/scienceresearch/technology/lowcarbonvehicleprocurementprog

NEWS FROM EPUK'S AIR QUALITY UPDATE MEETING HELD IN BIRMINGHAM

'R' is for statistical analysis

Leeds University modelling expert David Carslaw says air quality experts should use 'R' to analyse data. Carslaw says 'R' analysis is free and can unlock value held in the vast quantities of data that has been collected – value that is often wasted.

R is a computing language that has been developed as open source software – that means it can be downloaded for free. Rather like DOS, it is “not especially user friendly” but R can be very powerful when used to analyse data, allowing a large number of ‘what if’ interrogations.

Carslaw told the EPUK air quality update conference in Birmingham last month: “The US Environmental Protection Agency has adopted open source (free) software and there would be benefits in having similar open source software for air quality modelling in the UK. There is a gap between air

quality science and advanced statistical methods for data analysis. Experts may know what to do but have no time and little access to advanced tools for data analysis. More insight from the expensive measurements we collect is possible, and this will help make better decisions and improve the quality of the work we do.

“When first using R, there is rather a steep learning curve but don't be fooled by what it looks like. Once set up, in one click you can plot data in different ways that would take a long time alternatively. R takes the hassle out of processing data which only needs to be input in csv or txt format.”

Carslaw has used R to uncover patterns of emissions at Heathrow and has been instrumental in spotting the subtleties of direct NO₂ emissions from modern diesel engines (*AQB Sept 2006 p1*).

Carslaw added that analysing data is a chore – but said that R took away the tedium allowing experts to focus on asking the right questions of the data. For example it can quickly plot time series with desired averaging time saving the hassle of lots of data processing. “It is useful for awkward statistics (e.g. annual average of the daily maximum of the running 8-hour mean with a 100µg/m³ cut-off).”

“The advantage of being open source is that techniques can be spread cheaply. The disadvantage is that it is difficult to develop the technique commercially if it cannot then be resold – so there is a danger that we could put in a lot of money into this without much return. However what we have done so far is the tip of the iceberg – it has huge potential and has wider applications.”

● David Carslaw email d.c.carslaw@its.leeds.ac.uk

Timmis enthuses about directional sampler

Roger Timmis, air quality science manager of the Environment Agency, told the EPUK conference about the potential for low cost directional analysis of pollution.

Directional analysis can be used to pinpoint the likely source of problem pollutants, and is especially useful for dispersed sites with multiple low level sources.

The Environment Agency has been working with Lancaster University to perfect a low cost directional passive sampler for

NO₂. Conventional passive samplers – NO₂ tubes – are little more than a small canister into which gas can seep and collect on a sample which is then analysed to establish the average concentrations over the period they were exposed.

The new patented design, in wind tunnel tests, resolves both direction and concentration of NO₂, says Timmis. “This approach will give a cheaper and simpler way of basic air pollution monitoring.”

The device looks like a model

plane. It spins round to face the wind, collecting air which passes over a 360 degree cylinder leaving samples in directional 22.5 deg segments.

Timmis said: “Directional analysis offers better targeting, earlier signals and smarter networks. It offers cheap surveillance and attribution of area source performance. This is a new tool for the air quality monitoring toolkit and is the right technology to provide a scoping-level prediction prior to full monitoring.”

15 minute headache for generators

“The 15 minute sulphur dioxide objective is a standard our power stations were never designed to meet,” RWE NPower's Gill Hunter told the EPUK conference.

RWE is one of a number of generators who cooperate over their air quality impacts, especially in the East Midlands where there is a concentration of coal fired power stations.

The 15 minute SO₂ objective was proposed in 1995 and became UK policy in 2005. Generators have put pressure on

the Government to drop it as it is not a European requirement and therefore ‘gold plating’. It allows 35 periods of exceedence of the 266µg/m³ standard a year and until its introduction, power stations burning high sulphur UK coal easily met objectives.

After its introduction, power stations set up an air quality management plan to predict when exceedences might occur. By burning lower sulphur coal, or reducing load, exceedences were avoided. Hunter concluded: “Using this

approach, to date no local authority has had to declare an air quality management area due to power station operations.”

She added that despite the rocketing cost of oil, the air quality management plan was sufficiently robust to cope with any increase in burning of coal.

A recent report from SEPA revealed that emissions of SO₂ rose by 22% in Scotland as higher gas prices led to increased burning of coal by power stations (*AQB November p3*).

NEWS FROM EPUK'S AIR QUALITY UPDATE MEETING HELD IN BIRMINGHAM

Technical guidance in Spring

Defra air quality chief Sarah Dudgeon told the EPUK conference that revised technical guidance is now expected to be consulted upon in Spring.

The guidance is critical to local authorities for carrying out reviews and assessments. It will take until Autumn to finalise, but no surprises are expected. The delay to producing this guidance is unlikely to impact on local authorities provided final guidance does not spill into the following year as it did last time round.

In the coming spring (2008), most councils will only need to prepare progress reports, for

which guidance is already out. But for Spring 2009, a further review and assessment is due that will require technical guidance to be fixed in time for the work to be carried out.

Dudgeon pointed authorities to the new air quality indicator that will be used to measure the authority's own air quality performance. She said the DCLG would produce guidance and a spreadsheet to help produce this indicator (this has since been published – see news page 1).

She added: "We would emphasise to authorities that this indicator is not intended in any way to duplicate the local

air quality management system. Rather it is something that local authorities can influence themselves and act as a leader for their communities."

NO₂ tube periods

Preferred exposure dates for NO₂ tubes have been released for diffusion data to be compatible with the national data archive.

● Nitrogen dioxide diffusion tube monitoring – calendar of suggested exposure periods 2008 can be viewed on www.airquality.co.uk/archive/reports

Parkin presents London action on air quality

The GLA's Lucy Parkin outlined action in London to improve air quality.

The GLA has two key strands to improving air quality – a Londonwide low emission zone that is expected to be implemented in 2008 (*AQB June p8*) and an emissions-based element to the central London congestion charge (*AQB September p2*). The GLA also administers Local Implementation Plan grants for local authorities, some of which are available for air quality activities.

The congestion charge has already cut traffic volumes and congestion and reduced emissions of NO_x by 13%, PM₁₀ by 15% and CO₂ by 16%. However plans to link emissions to the charge (eg by charging £25 for the largest cars) are focussed on CO₂ reductions, leaving fears that air quality will be compromised as drivers switch to diesel.

Parkin also talked about personal exposure management initiatives. London boroughs are cooperating through the Airtext initiative. Air quality alerts are sent to those signing up to the service via mobile phone texts.

She also said that there had been unprompted requests for detailed air quality information from those seeking routes to walk to work through the www.walkit.com website. Central London boroughs are including

air quality information so that walkers can choose the least polluted route. Another website www.travelfootprint.org directly compares climate change and local air quality impacts of various modes of transport for a particular journey.

Hillingdon is helping local fleets through emission inventory management. For instance it can run cost and benefit scenarios of different fleet renewal options. The Energy Savings Trust offers free green fleet reviews, which include air quality as well as local air quality impacts.

Some boroughs have enforced anti-idling legislation, Croydon uses parking attendants, while Hackney targets problematic construction sites. Hillingdon focuses on local schools – 39 schools in Hillingdon have a total of 88 signs (see below).

On idling, Parkin said: "The boroughs have requested that idling becomes a driver offence rather than an owner offence to make it more effective.

Currently you can ask drivers to turn off their engine, and as long as they comply it is not an offence. But it doesn't stop them re-offending later."

Parkin declined to release details of a draft report on biomass use in London

developments. The GLA requires developers to include alternative energy generation in larger developments, and many are considering biomass boilers. But there have been fears that widespread adoption of such boilers could impact on air quality (see news, page 2).

London councils, coordinated by the City of London, has commissioned a report on the issue from AEA, a draft is understood to echo fears that widespread uptake of biomass could undermine efforts to improve air quality in hotspots.

Speaking from the floor, Scottish Government's Andrew Taylor said it had launched a probe into the issue.

He said that there was a large number of biomass plants planned in areas such as Dundee and Edinburgh and these could impact on the Scottish PM₁₀ objective (which is tighter than the rest of the UK).

Results are expected by February.



Hillingdon's switch off signs

IN BRIEF

CO₂ apportioned

Statistics have been released in a bid to be able to calculate CO₂ emission statistics at a local authority level.

The figures – currently in 'experimental' form – will be needed if local authorities are eventually required to measure and manage CO₂ emissions at a local level. Overall, 45% of end-user emissions assigned to local authority areas are attributed to the industrial, commercial and public sector, 27% to the domestic sector, and 28% to road transport.

● www.defra.gov.uk/environment/statistics/globalatmos/galocalghg.htm

Indoor air talks

Indoor air quality will be discussed at an Automation and Analytical Management Group (AAMG) of the Royal Society of Chemistry's Christmas meeting.

The Importance of indoor air will be held in London on the 13th & 14th December. The conference will be of interest to industrial, public health and environmental chemists who are involved in air monitoring, environmental and health studies.

● Website: www.aamg-rsc.org

Airalert extended

Sussex's airAlert text and phone air pollution warning system will be operational again from May 2008 for locals to receive free alerts during elevated air pollution periods. Sussex is also enlarging the service for children with asthma through schools with airAlert-4-schools in Sussex.

The Sussexair group is holding a conference on air quality and climate change on the 29th of February in Brighton.

● www.sussex-air.net/

Wales LAPC charges

Wales local authorities are being consulted on 2008/09 risk based fees and charges for local authority regulated industries.

● <http://new.wales.gov.uk/consultations/currentconsultation/envandcouncurrcons/1812510/?lang=en>

Growth trumps pollution fears

Plans to double the size of Heathrow – and BAA’s air quality action plan – have been launched. Growth can be accommodated ‘without further mitigation’ reports Jack Pease

Ever since an innocent-looking clause was tucked into the aviation White Paper in 2003, air quality has assumed greater-than-usual importance for the Government.

That White Paper said that expansion at Heathrow could not be supported unless European directive levels on nitrogen dioxide were met. No weasly civil-serventy hedge-your-bets woolly words such as “we will work towards” the objective – the clause fairly and squarely pledged that air quality objectives must be met for consultation to proceed.

Once the finality of that clause sank in, DfT quickly found £2m to convene air quality and aviation experts to agree the ‘methodology’ that air quality could be monitored and modelled at Heathrow. The Project for the Sustainable Development of Heathrow was born, experts jumped on the gravy train to come up with an ‘improved’ way of estimating air quality around the airport.

Their work endorsed the view that early air quality projections at Heathrow were overestimates, and that objectives will be

met. So the Government can now proceed with expansion with a clear conscience.

The consultation frames a series of key questions on which the public are being asked whether they agree or disagree. One of them centres on the air quality issue – stating the government’s assertion that the airport can be expanded within air quality objectives *without further mitigation* (our italics). Given that there are 200 air quality management areas around the country that *do* require mitigation to achieve objective limits, the justification for that assertion is worth dwelling on in detail.

In recent years, monitoring has shown that annual NO₂ limit values of 40µg/m³ are being exceeded at Heathrow. It is accepted that aircraft and vehicles contribute in varying proportions to those exceedences, which are gradually dropping over time.

The consultation says: “Air quality has been progressively improving, due mainly to emission controls on road vehicles and industrial sources. Emissions of PM₁₀ and NO_x from road vehicles have been reduced as progressively-tighter emission standards have been applied, and will further improve

in 2010 when further controls are introduced for specific vehicle types.

“The position is also set to improve beyond that as progressively-tighter standards come into force for both cars and trucks. In the light of these trends, the White Paper concluded that there was a better prospect of meeting air quality limits in the 2015-2020 period allowing time to reap the benefits of cleaner road vehicles and other technology improvements.

“As a result, future predictions of local air quality around Heathrow are therefore much more positive than was the case at the time of the White Paper. In addition the latest modelling has been shown to represent future emissions much more accurately than at the time of the White Paper, reducing a significant element of over prediction in that work.”

On PM₁₀, it adds: “Our analysis has confirmed the conclusions in the July 2006 report that PM₁₀ levels do not exceed EU limit values around Heathrow, and are unlikely to do so in the future. Annual mean levels of PM₁₀ in all future cases are consistently below 25µg/m³ against the

BAA Heathrow sets action plan to cut short term impacts

BAA released its latest air quality action plan for Heathrow Airport last month, just prior to the latest Government consultation on expansion.

BAA’s 2007-2011 action plan takes over from the previous 2001-2006 plan and sets out how the existing two-runway, five-terminal airport will manage local air pollutants in a bid to comply with European Directives. While the Government consultation says that no further action is needed to meet long term air quality objectives, the BAA sets out actions it says will help the airport meet shorter term objectives.

The action plans says: “The activities that take place at Heathrow Airport are a major source of air emissions locally. Therefore BAA has a significant role to play in addressing and reducing pollution levels in the local area.” The actions contained in the plan are part of a planning condition contained within the permission for BAA’s fifth terminal.

BAA’s action plan *almost* pledges that if the listed actions are taken, 2010 limit values will be met. But an ambiguous ‘driving’ word has been inserted into pledge, rendering it essentially meaningless: “By implementing this action plan, we are meeting the goal of driving full compliance with EU air quality limit values at residential locations where Heathrow Airport makes a significant contribution.” AQB asked BAA to clarify

whether this word diluted this pledge, it failed to respond.

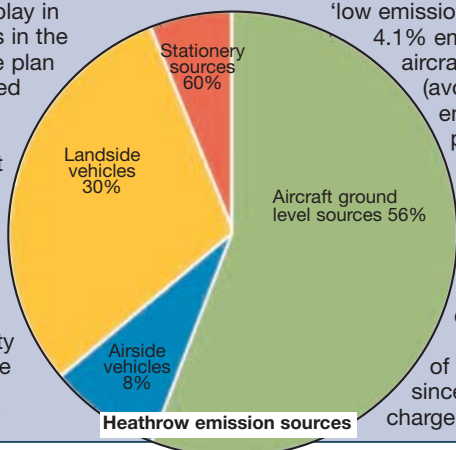
A second ambiguity could of course be in the use of the word ‘significant’ – airport impacts tail off pretty rapidly, but may still be sufficient to tip some marginal areas over the edge – eg the M4 motorway – and it is not clear whether the action plan is referring to such locations away from the airport.

BAA is attempting to try and allow its actions to be monitored. For instance its 2001-2006 plan has been ‘marked’ and BAA found it achieved 72 out of its 81 goals. It has set up a series of key performance indicators which will be regularly reviewed and reported upon in annual corporate social responsibility reports.

Sample key performance indicators include the percentage of ‘low emission’ planes (eg 22.7% of planes emit 20% less, 4.1% emit 40% below current standards). 2% of aircraft stands have pre conditioned air facilities (avoiding use of the jet fuel-powered standby engine in the back of a plane), and the percentage of airside vehicles in the ‘clean air programme’ (11.7%).

Another new feature of the action plan is an attempt at quantification of the actions – ie what emission savings will be delivered by particular parts of the action plan. These allow contour plots to be drawn showing the cumulative impact of the actions.

One action worthy of note is encouragement of low emission aircraft. These are incentivised, since 2004, through an emissions-based landing charge set at £1.10 per tonne of NO_x emitted.



limit of $40\mu\text{g}/\text{m}^3$. As $\text{PM}_{2.5}$ is a component of PM_{10} , the new objective for $\text{PM}_{2.5}$ will not be exceeded in any future case.

“Importantly, our modelling shows that even with a third runway, the combined effects of these technology improvements will see NO_x emissions in the Heathrow area fall by some 49% between 2002 and 2030, and NO_2 by 36% over the same period, without any further measures. This means that even with Heathrow handling around 702,000 annual movements, the modelling for the central case produce no results for NO_2 above the critical $40\mu\text{g}/\text{m}^3$ limit.”

In terms of population exposure, it is estimated that at the time of the 2002 assessment, some 7,336 properties were above NO_2 limits. In 2015, 22 properties will be above limits, and from 2020, no properties will be above limits, says the report.

A report by Atkins explaining more about population exposure calculations was released with the consultation. It says that the revised method for assessment (developed in the Project for the Sustainable Development of Heathrow) uses specified points for receptors rather than grids which can overestimate exposure because of the steep gradients involved.

The pattern of NO_2 improvement is repeated for assessments of nearby road exceedences (as opposed to exceedences caused by the airport itself). As the airport is

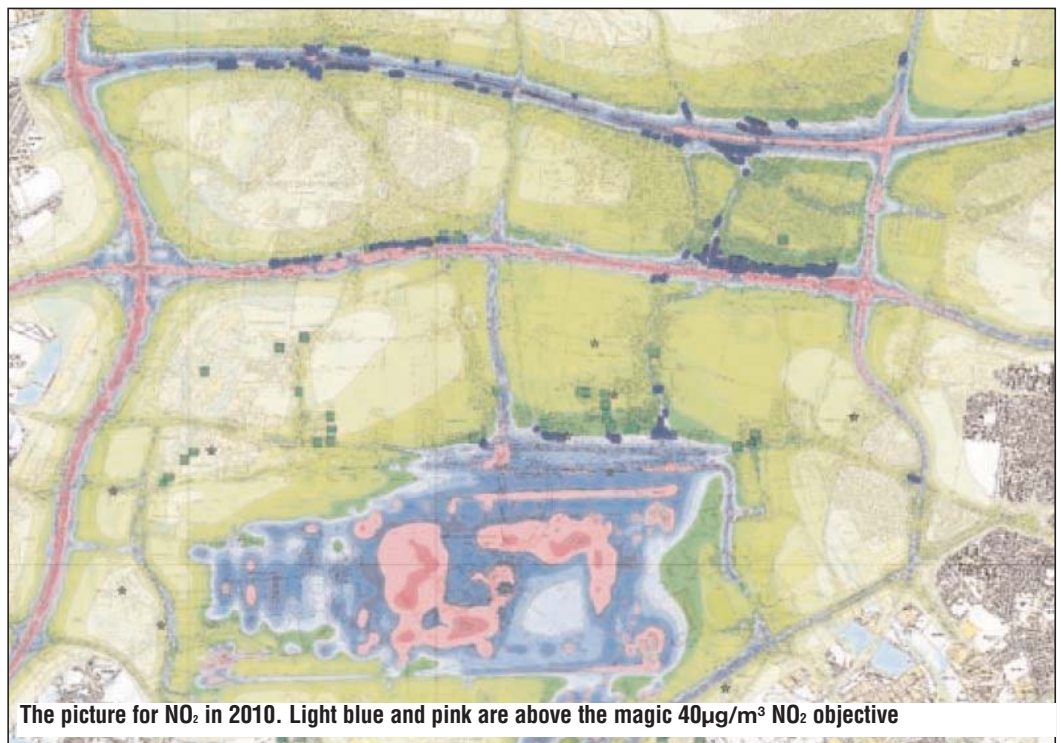
a major traffic generator for local motorways and roads where there are exceedences, the 2003 White Paper suggested that some form of traffic management would be required to allow Heathrow expansion to take place without exacerbating exceedences on these roads.

But reworking of air quality modelling has shown that the fall off in emissions, even with airport expansion, will leave just a few exceedences along the M4: “We do not therefore expect to have to resort to any of these (ie demand management) measures in order to satisfy the air quality constraint for a third runway.”

It can be seen that the assumption that NO_x and NO_2 are falling underpins pretty well all the assumptions that have led to the all-clear. Some see this as a dangerous assumption, given that local authorities – and indeed the Air Quality Expert Group – say that NO_2 improvements have stalled in recent years, with some areas rising.

Leeds University’s David Carslaw knows about as much about NO_2 as anyone, and told *AQB*: “Timing is the key. If the planned expansion of Heathrow took place today (or over the next few years) I think

● continued on p10



The picture for NO_2 in 2010. Light blue and pink are above the magic $40\mu\text{g}/\text{m}^3$ NO_2 objective

OPINION: DOES IT STACK UP?

A near-doubling of air traffic and nitrogen dioxide exceedences will disappear. A near doubling of planes and there’ll be no extra noise. Is this for real?

The Government would have us believe it is, producing thousands of pages of documents to prove the case. It relies on studies that support its case (for instance the £2m Project for the Sustainable Development of Heathrow) and dismisses studies that undermine its case (the £2m Attitudes to Noise Annoyance Study in England). Where does the truth lie?

As with many air quality issues, the answer is not easy. Air quality concentrations are derived from monitoring (which can be unrepresentative) and modelling (which is notoriously fickle). So official documents can never really ‘prove’ that air quality will be below European limits – the key promise made in the 2003 aviation white paper. Using different assumptions, others will no doubt prove the opposite of the official line by using different baselines and assumptions. Consultants must be rubbing their hands with glee at the prospect of years worth of prolonged arguments about air quality science.

Those arguments could become academic as the consultation points out it is likely that the Government will be able to apply for

exemptions from European air quality directive requirements if it fancies. All of this signals that despite talking the talk, the Government – when the chips are down – will not choose air quality, or indeed climate change over the industry lobby.

It may very well be that expansion of Heathrow is good for UK, but this can only be judged by a sensible cost benefit analysis. This consultation seems to treat it as a truism that aviation growth is a benefit, while it is sparing with allocating costs to downsides such as air pollution. How different is this to the rigorous cost benefit analysis contained within the recent air quality strategy – dubbed even by those outside Defra as perhaps the most painstaking and detailed analysis of policy ever undertaken.

Whatever the science, it just does not feel right that this scale of expansion can avoid air quality problems. Suspicion must rest with the treatment of road traffic growth and the resulting congestion, which of course can always be blamed on local authorities rather than the airport.

The Heathrow consultation is the clearest indication yet that for this government, air quality is even less a priority than global warming, and that’s not saying a lot.

Citizens probe air quality

Citizen's juries are being used to test areas of government policy – including air quality. Jack Pease takes a personal look at the process

The Government has been told by 'the people' what to do about air quality. A panel of ordinary people spent a few days talking about air quality, then came up with conclusions which have now been handed to Defra and ministers.

Citizen's Juries are a means by which Government can test policy and were introduced by former prime minister Tony Blair in a bid develop policy based on what people really thought. Critics considered the move to be yet more spin, and simply a means to make the Government *appear* to be taking public opinion seriously.

Air quality is certainly an issue that would test any jury. Air quality problems have moved on from the smogs of the 1950s, the current cocktail of pollutants are effectively invisible. Out of sight, out of mind, the public appear little bothered by air quality, despite well established health effects.

And so the Citizen's Jury on air quality confirmed. At the beginning, the panel were asked how concerned they were about air quality, and the answer was (on average) 2.83 on a scale of one to ten (one being 'not at all bothered', 10 being 'very bothered').

Now if the Government were interested in gauging public opinion, one might have

considered the jury's work done.

Question: Am I bothered? Ordinary Joe's answer: No. Outcome: cut funding again.

But the jury is more than just a Mori poll – it involves 22 carefully selected members asking questions of air quality experts, then drawing conclusions based on the answers. It is those conclusions that have now been publicised.

How valid these conclusions are is a moot point. The best air quality brains were wheeled in to talk to the jurors, who were corralled in a hotel for three long sessions to work up their conclusions. This inevitably had the effect of making the jury quasi-experts and considerably more concerned about air quality (an average of 8.83 out of ten) than when they started.

Given that the general population could never be educated to this extent, it seems to be an obvious flaw in the jury concept that the minute you educate the jurors, they cease to be truly representative of ordinary people.

Further, given that the report was completed in June 2006 and has only just been 'received' by air quality minister Jonathan Shaw, you can judge for yourself how much importance has been attached to the panel's findings.

Some jurors suspected as much. A few said that they did not expect Defra to take much – or indeed any – notice of their findings. They may have missed the subtlety that Defra's environmentally-conscious civil servants care very much about air quality and will take on board their comments.

But Government, and Treasury, are the ones that needed to be influenced, but they will be bombarded by dozens of other citizens jury reports on topics as wide ranging as health and education. Given that each of these will reveal that citizens become very concerned about issues when they are given special briefings by experts, the likelihood that air quality is pushed any higher up the political agenda seems pretty slim.

How was the jury chosen?

Twenty two members of the public were recruited from a 12 mile radius of Sutton Coldfield to take part in the Jury. They were offered £350 and free lunches as an inducement.

They were recruited by telephone as a cross-section of the public with screening to ensure that individuals with asthma, coronary and pulmonary obstructive

● continued on page 9, below right

KEY FINDINGS FROM THE CITIZENS' JURY REPORT

“ This Citizens' Jury has shown that members of the general public are quite capable of understanding and questioning information regarding air quality. Given the time to engage with the key issues, easy access to information and perhaps most importantly the incentive to access it, members of the public are able to identify what is important to them regarding air quality and come to informed conclusions about appropriate actions.

Very few, if any, members of the jury would have pro-actively sought information about air quality prior to taking part in this project. So if the jurors are typical of the wider public, and the literature review suggests that they are, simply making information available, however accessible in terms of either content or media, will not lead the average member of the public to find out about the topic.

The jurors' values could be summed up as:

- A desire to minimise adverse health effects;
- Support for ensuring a competitive UK economy that provides jobs; and
- A belief in fair treatment of less well-off members of society.

These values underpinned the jurors' expectations. They did not expect any organisation or individual to have the freedom to pollute in a way that would seriously affect the health of others. However, the jurors did not expect controls over pollutants to be so tight that the competitiveness of UK industry was adversely

affected. There was a relatively consistent UK focus to the discussions and although air quality was seen as a global issue, concern about either pollutants, or steps taken to control them, were largely driven by local impacts. There was a hope that society as a whole might be able to move towards a philosophy of lower consumption, which would provide knock-on benefits in terms of air quality. There was however, little expectation that this would happen to a degree that would have a profound effect on air quality. The jurors therefore recommended that Government should take the lead in improving UK air quality.

Government was expected to take a number of actions, in particular it should:

- Continue to regulate the emission of air pollutants;
- Reward good behaviour as well as punish failure to comply with regulations;
- Raise the understanding of the impact of individual behaviour on air quality; and
- Support investment in cleaner technologies and promote their uptake.

The jurors said that any Government expenditure should be seen as an investment, rather than a cost, largely due to the beneficial impact of better air quality on health. Information was seen as central to making different actions acceptable and the jurors thought that it was crucial that Government take a proactive role in campaigns to provoke action. ”

Democracy in action? Or a waste of time?

AQB attended the ‘handing over’ of the citizen’s jury’s findings on air quality last month. The event was well stage managed, with air quality minister Jonathan Shaw politely appearing for the first few speeches before disappearing off to more important matters. Three jurors were then left to ‘tell’ Defra what they presumably already knew, having sat on the report for more than a year.

Certainly there were few surprises in what the jury came up with. The bunch of ordinary people had little interest in air quality when they first signed up to the exercise, which promised a free lunch, sandwiches and £350 cash. And after they listened to air quality experts such as health expert Frank Kelly of ERG, they changed their mind and decided that air quality was after all quite important as it affected health.

Defra’s AEQ head Martin Williams chaired the event in his usual wise and patient manner and the jurors were allowed to speak – some more than others. A lot more. It is thus surprising that in this respect, the summary report claimed that the more dominant, louder voices didn’t fully drown out the quieter ones, all the jurors felt they had been able to contribute.

Certainly at the meeting AQB attended it was clear that there were dominant characters who were well versed in technology and business who tended to take centre stage. It is a moot point whether one juror – clearly far from an ordinary member of the public because of his grasp of the issues – could be considered representative.

Take this contribution at the launch which is clearly very complex: “We have been privileged to have access to high quality information and enjoyed the exercise. However as a technologist, since the report was concluded I can no longer subscribe to the recommendations any more.

“For instance we recommended improvements in technology – but this is a self defeating process as anything that becomes more efficient gets used more, runs faster and uses more energy, and creates more pollution. We didn’t discuss the big issues of consumption and demise of fossil fuels – that’s a big mistake.”

Williams responded to this: “From hereon in, improvements will come more through behaviour change rather than technology change.” Whoops – Williams is talking sense rather than mindlessly citing the air quality strategy – this has just three new action points – all to do with technology. (It’s a safe assumption that new action on consumption was cut out of the strategy by the DTi and DfT.)

The more-than-averagely-informed juror wasn’t about to let up: “Sustainability is a red herring to me. People don’t see sustainability as keeping people alive. They see sustainability as keeping their industry alive. We should change the game from making as much money as possible – everything in this world is owned except air, sunshine and parts of the ocean and these are not

properly managed. We should own these on an equal basis.”

Wow. He might have choked somewhat on the name chosen for the Project for the Sustainable Development of Heathrow.

Our guess is that characters with developed views such as these couldn’t help but skew the report. For instance it is suspicious that there was quite such an emphasis on avoiding any regulation on business (although this might result from the juror’s catchment area which is predominantly industrial).

The public usually pick on industry first as it avoids taking action themselves. A more typical reaction can be seen in another juror’s suggestion that trucks be banned from the roads at weekends (presumably so they can drive more easily to supermarkets with magically stocked shelves).

Joking apart, it is of course a good thing that air quality was considered important enough to be discussed by a citizen’s jury, and that time was taken to inform 20 average members of society who have themselves become pollution ambassadors – or in their own words ‘pollution bores’.

But whether anyone beyond Defra listens to their views is a different matter. In the past month it is once again headline news that Defra’s environmental protection budget is being cut at the very time that the Government is espousing increased action. So the signs are not good. And of course Heathrow is hardly a vote for air quality.

The last word to Defra’s Martin Williams: “I do believe citizen’s juries are a good thing, there is only so much you can do with regulation. We are having to move beyond technology towards engaging people. In terms of this process, we have had to be careful about not biasing the jury’s responses. Giving you too much information could turn you into Defra clones that simply give us the answers we want.”



Air quality minister Jonathan Shaw listens politely to members of the jury

diseases were represented (as these groups are known to have specific concerns on air quality). Quotas on age, sex and ethnicity were also imposed. Anyone linked to local government, environmental groups and journalists were automatically excluded.

The jury process was overseen by an advisory committee of air quality experts, with the jury sitting for three hearings. The project had a number of elements:

- An advisory committee;

- A literature review of public perspectives on air quality;
- Telephone recruitment of jury;
- Three hearings over 3½ days (in December 2005);
- A charge for the jury to address;
- Witness presentations to the jury;
- Opportunities for jurors to debate the issues;
- Recommendations from the jurors to Defra (January 2006);

- Report drafted by PSP and agreed with the jurors (July 2006);
- Publicity for the event and the recommendations (October 2007)
- Evaluation.

As might be expected, the ‘raw’ participants knew little about air quality, and hadn’t thought about it before. Having listened to the air quality experts, they

- continued on page 10 overleaf

Citizen's jury: continued from page 9

agreed it was "more important than originally thought", principally because of its impact on health.

The draft charge that Defra officials proposed for the jury to consider was: "What improvements, if any, would people like to see in air quality and how should these be achieved?"

The jurors turned out to be unwilling to take this charge on board for two main reasons. The report explains: "Firstly, they felt that they did not know enough about the options for improvement, which they thought might be dependent on the causes of air pollution. Secondly, they were uncomfortable in being asked to speak on behalf of the wider community. The jury felt that they could more readily address a series of questions:

- Is there a continuing problem with air pollution?
- If so what kind of problem is it?
- What actions would be preferable?
- At which level should decisions on actions be taken?
- At what level should actions be taken?

Discussions on these issues continued through the jury events, with their comments eventually being compiled into a report (for key conclusions, see box, on page 8).

This report was circulated to jurors for comment prompting this comment: "On the whole the jurors were satisfied that the report gave an accurate summary of the proceedings of the jury and that the quotes used represented the spectrum of opinions. There was some concern that the recommendations were somewhat isolated from the descriptions of the discussions and it was felt that this detracted from their impact."

Some jurors said the headline recommendations were bland compared to the rest of the report.

One possible reason for this was the omission of particular ideas (worked up by jurors) from the final report, including:

- Regulations on traffic;
- Pollution vouchers;
- Pollution police or equivalent rights for civilians to report polluters; and
- The development of personal pollution monitors.

Only six jurors thought that Defra would take their views 'very seriously'. Indeed Defra's air quality expert Sarah Dudgeon attended a jury meeting and provided feedback which was ominously vague. The report notes: "The Defra representative responded that she was pleased to receive such a comprehensive set of ideas and that

all would be considered. She did however, make the point that there could be no guarantees that all the ideas would be taken forward by Defra.

"For example, some may be impractical following further thought and development. Others may fall outside Defra's remit, although the Department would pass on relevant ideas to other responsible organisations. She confirmed that part of her role was to ensure that the recommendations and final report were widely circulated within Defra to ensure that they were considered by the appropriate people."

And the lack of urgency of the exercise has already been mentioned, with the report taking over a year to formally hand to the minister Jonathan Shaw who could only muster: "I will now be looking at the report in detail, and considering how it can inform our policy making." Defra will now consider its response (although it has had it more than a year).

Shaw is not shaping up to appear a dynamic minister, even when compared to the low standard of recent environment ministers. This report's lacklustre reception from a lacklustre minister does reinforce participants' fears that their views will not be taken seriously.

Heathrow expansion: continued from page 7

the conclusions would be very different. Because we are looking at post 2015, there will be quite a few developments in emissions reduction in that time. All of this will come under intense scrutiny over the coming years through public inquiries and the like.

"A key issue is how emissions of NO_x (and NO₂) will change from diesel vehicles over the coming years. There's still some way to go to reduce diesel NO_x from both light and heavy duty vehicles, although technologies such as NO_x traps and SCR should begin to bite. The three-way catalyst really has had a major impact on petrol vehicles – CO and HC have reduced dramatically. What we really need is the same step change for diesel vehicles."

A whole heap of detail is contained in modelling work carried out by Cerc: "Between 2002 and 2030 there is a 51% decrease in total NO_x emissions modelled and this is mostly because of the predicted 80% reduction in NO_x due to road traffic due to improved vehicle technology. Over the same period NO₂ from road traffic is also predicted to decrease significantly although by less, by approximately 60%." The report uses a 10% NO₂:NO_x ratio for 2002, rising to a 21.8% in 2030 reflecting higher ratios for modern engines.

Inevitably cost and benefit calculations were relied on, as in the recently developed air quality strategy.

The total cost of a three-runway, six-terminal option is £11.9bn-£12.7bn, of which £4.8bn is due to climate change costs, and £0.3bn for air quality and noise costs. The consultation admits it has not carried out a quantification (and thus comparison) of costs of comparing the additional NO₂ that would arise from an expansion options over a decision not to leave Heathrow as it is.

Benefits are valued at £17.1bn, made up of "greater ability to travel, reductions in travel costs for passengers, greater frequencies of services between destinations, government tax benefits from air passenger duty and benefits from additional freight movements."

The latter will raise some eyebrows among those versed with recent developments on new road capacity. In the early 1990's the realisation dawned that it would be impossible, and not necessarily beneficial, to meet all demand for journeys and the talk now is about 'demand management' ie road pricing to deter journeys. This accepts that the benefit of a personal journey may be outweighed by the disbenefit caused by that journey's impact

on congestion and the environment.

Such concepts have not crept into aviation thinking as yet – witness the treatment of additional freight movements as a society 'benefit' (at a time that there is pressure to reduce 'food miles' and the like).

The cost benefit analysis also does not address issues raised by protesters about the assumption that airport growth helps the wider UK economy. Protesters say the growth in air travel has been fuelled by cheap leisure flights with more UK citizens flying abroad to spend their money overseas, rather than foreigners coming to the UK to spend money here. In other words, where's the benefit?

One big question that has been vexing airport observers is whether or not the Government could avoid the air quality issue altogether by applying for a derogation for Heathrow.

The question is not answered – the delay within Europe in agreeing the latest air quality directive makes it impossible for the Government to assume there are any exemptions to apply for.

The five years grace that such an exemption would allow would tidy up the awkward issue of 22 houses above limits in the early years.

SCIENCE SHORTS

PARTICLES

Increased risk for heart patients

Particle exposure can significantly worsen the prognosis for those that have previously suffered heart attacks.

Harvard researchers looked at nearly 200,000 patients who have previously had heart attacks across 21 US cities. Each city's PM₁₀ concentrations for particular years were then correlated with health derived from individual follow ups.

For a 10µg/m³ increase in PM₁₀ exposure, researchers found a 30% increased risk of death, a 40% increase in risk for

a further heart attack, and 40% increased risk for other further hospitalisation.

Researchers explained: "We found a significant effect of long term exposure to airborne particles on the risk of death, progression to heart failure and a subsequent myocardial infarction in a large multi city study of subjects discharged alive following an acute heart attack. This association was not due to differences between cities in exposure, but resulted from the association of year to year changes in mortality risk

with year to year changes in exposure."

They added that this was the first large cohort study looking at heart attack survivors and focused on the elderly,

They added: "This is a large group, and hence this finding has substantial public health implications."

Particulate air pollution, progression, and survival after myocardial infarction, Antonella Zanobetti et al, *Environmental Health Perspectives*, Vol. 115, number 5, May 2007, pp769-775.

HEART ATTACKS

Diesel prompt increased heart risk

Diesel pollution causes a range of conditions that could result in heart attack or stroke, researchers have told an American Heart Association conference.

"The study results are closely tied with previous observational and epidemiological studies showing that shortly after exposure to traffic air pollution, individuals are more likely to suffer a heart attack," said Edinburgh University's Andrew Lucking.

He continued: "This study

shows that when a person is exposed to relatively high levels of diesel exhaust for a short time, the blood is more likely to clot. This could lead to a blocked vessel resulting in heart attack or stroke."

The study included 20 healthy men, aged 21 to 44 years old. They were separately exposed to filtered air (serving as a control group) and to diluted diesel exhaust at 300µg/m³. At two hours and at six hours after exposure, researchers allowed a small

amount of participants' blood to flow through a perfusion chamber.

Compared to filtered air, breathing air with diluted diesel exhaust increased clot formation in the low shear chamber by 24.2% and the high shear chamber by 19.1%. This was seen at both two and six hours after diesel exposure.

The researchers also found an increase in platelet activation. "When activated, the platelets can stick together and form a clot."

MARITIME EMISSIONS

Shipping to blame for 60,000 deaths

60,000 died in 2002 as a result of "under regulated" ship emissions, researchers say.

They add that the death toll is estimated to grow by 40% by 2012 due to continued large increase in global shipping traffic.

The US study is claimed to be the first research study to estimate global premature deaths linked to harmful emissions from ocean-going vessels. The study analysed ship emissions' health impacts, estimating global and regional mortalities by integrating global ship inventories, atmospheric models, and annual cardiopulmonary and lung

cancer deaths.

The report authors found that health impacts were concentrated in coastal regions along major trade routes. One-third of all shipping deaths occurred in Europe.

Negotiations on new air pollution standards for ocean-going ships have been ongoing for about 15 years at the IMO, the international body charged with regulating international marine environmental issues. To date, its only action on ship air emissions – adopted in 1997 and implemented in 2005 – incorporated improvements already adopted by most of the

industry.

Using cost methodology employed by U.S. EPA to value the benefits of particulate emission reductions, the US Clean Air Task Force estimates that the 60,000 annual death toll from ocean-going ships currently costs more than \$330 billion per year, with premature deaths increasing with projected freight growth to cost more than \$460 billion annually by 2012 – far more than clean up costs.

● *Mortality from ship emissions: A global assessment* can be viewed on <http://pubs.acs.org/cgi-bin/sample.cgi/esthag/asap/pdf/s071686z.pdf>.

Glasgow PAH high

A study of PAH levels in three European cities has found high levels in Glasgow.

15 different PAH compounds were analysed in soil samples taken from Glasgow, Turin and Ljubljana. High concentrations were only evident in Glasgow where the some of PAH concentrations were 1,487-51,822µg/kg, and ten times lower in the other two cities.

Most PAHs were found in the historic quarters of the cities.

Soil pollution by PAHs in urban soils: a comparison of three European cities, E Morillo et al, *Journal of Environmental Monitoring*, 2007, Vol. 9, pp1001-1008.

Air on the brain

Canadian researchers say ozone and particles can affect the arteries in the brain.

Tests on rats showed that ozone and particulate matter rapidly modulate the expression of genes involved in key vasoregulatory pathways in the brain and pituitary, substantiating the notion that inhaled pollutants induce cerebrovascular (brain artery) effects."

Air pollution alters brain and pituitary endothelin-1 and inducible nitric oxide synthase gene expression, Errol Thomson et al, *Environmental Research Vol. 105 (2007) pp224-233.*

Bus rides are bad

Heart problems were seen on elderly volunteers taking trips on diesel powered buses.

Harvard researchers recruited 44 volunteers to ride on buses while having their heart rate measured. The electrocardiograms were correlated with continuous particle analysers and other relevant variables.

Heart rate variability increased with fine particle concentrations, more so with 24 hour mean concentrations than short term exposure. Short term associations were prevalent for traffic related particles.

Focused exposures to airborne traffic particles and heart rate variability in the elderly, Sara Adar et al, *Epidemiology*, Vol. 18, number 1, Jan 2007

HOT AIR

The Citizen's Jury exercise on air quality may have told us what we already know, but it did contain some interesting truisms.

One juror commented: "My wife says I'm a pollution bore now" Yep, been there!

Luckily the effect does wear off. Another juror commented they were very conscientious about air quality after hearing about its effects. For two days.

There's not much to laugh about in the consultation for expanding Heathrow, but one expert modeller contacted AQB with this gem.

The report states: "This assessment also reflects improved air quality modelling, which has been shown to represent future emissions much more accurately than before, and to reduce a significant element of over-prediction in the earlier work."

This made our reader laugh out loud: "So they can predict the future better now! How do they know?"

Back on Heathrow. What a contrast there is between the £2m spent on ensuring modelling results are favourable and the costing of the air quality disbenefits.

The consultation simply hasn't

bothered to cost the difference in air quality impacts between do nothing and a fully expanded Heathrow.

And at first you think they're joking when they mention NO₂ -munching catalytic paint noise barriers as a serious option for reducing motorway NO₂ concentrations. They aren't.

Here's a new twist to pollution and social equity.

We keep hearing about the need to tackle poor air quality in deprived areas to reduce the health burden on the poor. Unwittingly the private sector has come to the aid of such areas – because of the lower life expectancy, insurers will pay higher yearly pension payments to those in living in deprived areas.

Nice thought, but we suspect that relatively few poor people have private pensions. But it does underline the point that air pollution can have a very real cost.

Consultants have a hard time filling air quality vacancies. AQB hears time and time again of the difficulties in recruiting.

So it is with some concern to note that Air Quality Consultants, which has also been trying to recruit recently, appears to have gone beyond the extra mile to ensure there is a plentiful pool of air quality recruits for the future. The firm's Claire Beattie and Penny Wilson have recently produced (and Nicki Woodfield not so long before that), all from one firm!

Congratulations, especially to Penny, her sprog seems particularly interested in the subject (see below).



Air quality babes with mum's Beattie and Wilson

AIR QUALITY EVENTS 2007

2007

3rd December IAPSC

Investigation of Air Pollution Standing Conference meeting to be held in Austin Court, Birmingham. Sue Powditch 0870 190 6551

13-14th December THE IMPORTANCE OF INDOOR AIR

Society for Chemical Industry conference to be held in London website <http://rsc-aamg.org/Pages/Meetings.html>

2008

16th January AIR QUALITY IMPACT ASSESSMENT

EMAQ seminar to be held in Bradford www.emaq.aeat.com

24th January AIR QUALITY IMPACT ASSESSMENT

EMAQ seminar to be held in Birmingham www.emaq.aeat.com

31st January AIR QUALITY IMPACT ASSESSMENT

EMAQ seminar to be held in London www.emaq.aeat.com

21st February NSCA SW CONFERENCE

Watershed, Central Bristol, email david.muir@bristol.gov.uk

29th Feb CLIMATE CHANGE AND AIR QUALITY

Sussex air quality steering group 2008 meeting to be held in Brighton website www.sussex-air.net

3rd-4th April AIR QUALITY SPRING WORKSHOP

EPUK (ex NSCA) spring workshop, contact Lucy Salter, EPUK 01273 878770

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Editor: Jack Pease

tel 01737 642283 (fax 0870 135 8189)

email jackpease@empublishing.org.uk

Marketing: Jackie Luff tel 01737 645348

email jackie.luff@empublishing.org.uk

Website: www.air-quality-bulletin.org.uk

Address for correspondence: PO Box 592 Redhill RH1 3WN

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