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Bumper 16-page issue

PLANNING

Potter proposes planning tool

Croydon's Stephen Potter has revealed a new planning tool that could avoid arguments over significance.

Early trials of the new tool suggest that despite attempts to reduce the environmental impact of new developments, air pollution impacts are worsening, not improving.

Air quality professionals should be consulted on new developments in areas prone to pollution. The aim is not to worsen air quality problems, especially in air quality management areas.

However assessment of the significance of new developments can get bogged down (*see also our feature on p9*) allowing a string of small, low polluting projects to go ahead that together may have a significant impact. At the moment, planners are encouraged to use Epuk's planning and air quality guidance.

Potter told the recent Iapsc conference held in Sheffield about a new Planning Emissions Reduction Assessment Tool (Perat) which he helped develop: "We have grappled with this for ten years. Is it time we changed our approach to handle cumulative impacts better?"

He explained that there is recognition that emissions from the built environment (non-point sources) are increasing relative to total emissions. And despite measures such as low emission zones and Euro standards to tackle vehicle emissions "current approaches to reduce emissions from new development aren't delivering much". "Mainly we consider only 'significant impacts' on air quality from each development resulting in 'creeping background' – a large number of developments with small, negative impact making it very difficult to pin down developers in a way which makes a difference on the ground."

He added that various

● **Continued on page 3**

LONDON

AEA makes London air suggestions

AEA has submitted a series of recommendations to the GLA in a bid to influence the ongoing revamp of the London air quality strategy.

The input was prompted by the GLA's recent inquiry into air pollution in London into which AEA made a submission.

It suggests the GLA has to date been too rigid, and very dependent on a handful of technical measures. AEA offers a more objective-oriented strategy using a flexible framework of measures that range beyond technical activities to include wide ranging and low cost public information and behaviour change measures as a better way forward. It suggests more responsive governance mechanisms and a need for better efforts to aim for co-benefits with greenhouse gas management, transport improvement and buildings stock upgrading and health.

AEA says: "Our first, and key recommendation is that the new strategy be given the specific objective of achieving air quality compliance, meaning achieving the locational specifics, concentrations and deadlines related to the EU air quality limit values." This will please bodies such as Campaign for Clean Air in London which has similar desires.

Other recommendations include the examination of very low cost 'German style' LEZ schemes at the pollution hotspots, coupled to a vehicle scrappage scheme. It also points out that the typical cost of installing 35 road humps is between £85,000 and £175,000, and there are 35,000 humps in London. The annual air quality management spend in a London borough is between £80,000 and £120,000.

AEA's Iarla Kilbane Dawe told *AQB*: "The point is that we can do this – look at what has been achieved in reductions in road deaths over the last decade, and you'll see how a very similar problem with very similar causes can be really seriously tackled.

"The challenge in putting a good, positive strategy forward is of course that we don't want to do things that will be rendered utterly redundant by advances in engine technology anyway. But at the back of it all, we know for sure that advances in air quality will be paid for ten-fold in improvements in health."

INSIDE THIS ISSUE ...

IN BRIEF

Tweeting on air

As temperatures climbed into the 30's and moderate pollution levels forecast, King's College London has launched a new service which provides real time air quality updates and summaries on Twitter. Last month the group launched an Iphone app for air quality (*AQB June p8*).

twitter.com/_londonairnow provides an hourly update from the London Air Quality Network's 100+ monitoring stations across London and twitter.com/_londonair provides a summary of the previous day's pollution along with news items.

ERG says: "Twitter has grown hugely over the last two years to become one of the most popular social networking sites with millions of users worldwide. You do not need to be a twitter user to view these updates.

"This service adds to the London Air webpage, RSS feeds and iPhone application as ERG continues to broaden the number of ways Londoners can access important air quality information."

ERG's Gary Fuller added: "It was quite challenging to make a sensible Tweet but we wrote a sophisticated algorithm that not only produces the Tweet but also concatenates the information depending on the complexity of the air pollution at the time."

● More details can be found at www.londonair.org.uk

Too much news

We've expanded to 16 pages and we still can't fit in all this month's news, we've had to hold stuff like ERG's London report and emission factors till next month.

NEWS FROM LAST MONTH'S INVESTIGATION OF AIR POLLUTION STANDING CONFERENCE MEETING

IN BRIEF

Biomass baseline

Attempts have been made to establish a baseline for biomass emissions in London.

Concerns have been raised that increased provision of wood burning and other biomass heating plants could worsen air quality, especially particulate. But measuring any impact will be difficult as there is little understanding of current biomass emission levels.

Gary Fuller of Kings College London ERG told the Iapsc Sheffield conference of attempts to establish current emission levels. Recent studies have shown that high uptake of biomass could lead to breaches of limit values for PM_{10}.

Two methods were used, the first using light absorption of particles. Wood burning particles have different optical properties compared to particles form traffic and other sources.

Data from North Kensington, Greenwich and Marylebone Road showed winter peaks, which is plausible, and evening and weekend peaks, which is plausible given that people are more likely to burn wood when it is cold, and in the evenings and weekends.

A second method involves measuring levoglucosan which is emitted by wood burning and a good tracer for wood. Again, analyses of data plots suggested the data was feasible.

The two tests suggest that during mid winter time PM_{10} from woodsmoke makes up 3-4µg/m^3 of the average 25µg/m^3 found at the monitoring sites. Fuller said: "If we were to assume about a third of PM_{10} in London arises from sources in the capital then biomass is already a big proportion of London's emissions. Now we have a baseline which we can use in future years but we are still not absolutely sure whether the wood burning particles come from London or long range transport."

Oxford finally cracks bus woes

Oxford City Council's Roger Pitman told the Iapsc conference in Sheffield of the long running battle between the city council (which has the air quality responsibilities) and the county council (which has the transport responsibilities).

Attempts to improve air quality over a decade involve a tale of political tussles that will strike a chord with many non unitary city authorities across the UK. Oxford's tale has ended in some success – a low emission zone for buses has now been agreed (*AQB June p5*).

The university town of Oxford is riddled with deep street canyons with large pedestrian and traffic flows. Gradually vehicles have been excluded from the city centre leaving buses and taxis – but little change in pollution.

As has happened in London and other urban areas, despite cutting traffic emissions, rising NO_2 concentrations had been blamed on failure of new emission standards and the impact of rising direct NO_2 emissions from heavy duty diesel engines found in buses.

Pitman explained: "It's taken eight years from declaring an AQMA in 2001, itself following three years of reviews and assessments. But we got there eventually. A key constraint has been the extent to which the debate has been held in the public eye. Transport plans for Oxford have frequently hit the headlines with strong arguments for and against stronger action. The papers quoted one official source as saying 'There is no significant air pollution problem in Oxford' at a time that we were monitoring high air pollution."

At the heart of arguments was the Oxford Transport Strategy which set out to improve the environment in the city centre. But modelling showed that possible pollution reductions in the centre were counteracted by worsening in the outskirts because of displaced traffic. "This was not on their radar at all," said Pitman. "Buses were the key to the pollution, and yet buses were key to the strategy."

A deadlock ensued, and Pitman welcomed Defra's intervention. Defra sent Oxford (and other local authorities) letters warning them that they must fulfil their statutory air quality responsibilities or else. "This nicely worded letter allowed us to face problems and move on and work together to come up with solutions."

This led to a joint air quality action plan in 2006 which tied in to the county Local Transport Plan. "We had to prove to the transport planners and politicians that further measures were necessary in order to get the necessary air quality improvement," said Pitman. He noted that things would in future be more of a challenge now that air quality is no longer a shared priority within the third round of the LTp process.


Oxford buses

The air quality action plan contained targets. One was: "Traffic generated NO_x emissions in the AQMA need to reduce by an average of 68% to meet the air quality objective for NO_2." NO_2 in central Oxford is currently 64µg/m^3, the target is to reach 53µg/m^3 by 2011. A 20% reduction in traffic emissions is calculated to result in 6µg/m^3 reduction (new vehicles will lead to a further 3µg/m^3 reduction, and background reductions will contribute a further 2µg/m^3 cut).

To achieve the extra emission reductions, the agreed solution was a low emission zone. Implementation via a traffic regulation order and enforced by camera would have cost over £1m and was not cost effective. It was decided to use Traffic Regulation Conditions, the local Traffic Commissioner had seen these regulations work in Bath and was happy to use them in Oxford.

The condition would stipulate Euro 5 for buses and coaches by the end of 2013. But Pitman says a real strength of the agreement is that this condition will not be needed if the bus companies achieve the improvements voluntarily.

MITIGATION

NO_x eating paint leads to huge drop

Rebecca Pointon of Cheshire East revealed new data on trials of Ecopurer NO_x-eating coatings in Congleton. The busy A34 sees traffic passing within feet of residential front doors (see pics, right).

Earlier reports had shown promising results (*AQB March p4*), Pointon revealed to the Iapsc audience that before and after NO_2 tubes showed a 28% fall in NO_2 concentrations. Tubes set out as background controls showed a rise in concentrations. (*see also p16*).

With many sceptical at the dramatic results, Pointon said further studies were needed to see whether the effect wore off after 12 months. More data on weather and wind direction were needed, and checks on activity in daylight and darkness.

NEWS FROM LAST MONTH'S IAPSC MEETING HELD IN SHEFFIELD

Potter, planning, from p1

guidance documents produced over last 10 years have grappled with this and yet few developments with significant air quality impacts have been turned down based on the current approach. Potter questioned: "But isn't any detrimental impact on air quality in an area of exceedence of an air quality objective or EU limit value significant?"

Rather than talking about significance, Potter would rather use the term 'unacceptable impact': "Isn't an impact unacceptable if there is an alternative in taking cost-effective, proportionate measures to minimise or offset those emissions rather than just limit them to some fairly arbitrary threshold of significance?

"We cannot halt all development in air quality exceedence areas but we need a better approach to deal with cumulative impacts, for instance a local, evidence-based target for reducing NO_x and PM_{10} and a target for cutting emissions to meet those local targets, with new development given a share of the target to hit."

He also introduced the concept that emissions from new development should result in a decrease in emissions compared with the land use previously on the site. This could be set in local planning policy which is currently happening in Croydon.

"But a policy is one thing, any new policy would have to be capable of being implemented in practical terms or else it would fail at the first hurdle. Information on emissions from a site is not readily available at the moment, especially if closed or derelict. There is no duty on the landowner to provide this information to a developer, indeed the information may not even exist.

"Can we ascribe emissions to land use data, and if we can, can we make this freely available and make a spreadsheet to make it easy?" Potter asked.

AEA is being commissioned to produce this with Beacon and Defra air quality grant funding. An early draft was presented to air quality regional coordinators' meeting late last year.

The tool is based on data from the National Atmospheric Emission Inventory and CIBSE energy density data for different building types. The idea is to have a spreadsheet that yields data such as CO_2, PM_{10} and NO_x per sq m of different use types.

Potter said that where the model has been validated against known emissions in seven case studies, it has been found to overpredict by 10% – which is reasonably close.

"But the scary part is that modern developments appear to lead to a 200-400% increase in CO_2 and NO_x emissions, flagging up a significant challenge. I am not saying that we shouldn't redevelop in urban areas, but do we really understand what is going on before and after we develop land? What are the implications of the intensification of emissions in already sensitive areas?"

The Perat model is to be further developed with a final report and recommendations due in September.

Potter is keen to talk to any local authorities that wish to take part in the development of the tool.

● Email stephen.potter@croydon.gov.uk

Vaughan savaged

Defra air quality man Robert Vaughan suffered a Jeremy Paxman-style attack from Alan Walder of the London Borough of Redbridge.

Walder picked up that Vaughan had changed his presentation since the ERG conference in spring (*AQB May p2*).

Walder questioned Vaughan from the floor on the matter, and was given a stock answer. Walder was not satisfied: "With respect, you haven't addressed the issue. At the last conference, we saw your slide of NO_2 going down, and ERG's slide of NO_2 going up. Which figures are you going to present to the Commission? You have not addressed the big discrepancy between modelling and monitoring in the figures you are taking to Europe."

Vaughan replied that the UK had to report back to Europe on the basis of national monitoring and modelling: "We are going to write to local authorities to show them where national modelling shows exceedences in their area and seek their comments.

"However we will report to the Europe what Europe requires us to report."

Walder challenged Vaughan for a third time – but the debate was curtailed due to lack of time.

POLICY

Vaughan sets out timetable for NO_2

Defra is likely to consult on proposed measures to achieve NO_2 compliance in late 2009 for submission in summer 2010.

Speaking to the Iapsc conference, Vaughan's presentation differed slightly from previous talks, he now acknowledges adverse trends for NO_x and NO_2: "Road transport emissions have been revised upwards because more modern cars have not performed as well in real life driving as was suggested from rolling road test cycle measurements. Particle abatement has brought about increased primary NO_2 emissions from larger diesels."

He also noted that higher emissions may arise from vehicles with failed catalysts, slow fleet turnover, vehicle speeds and changes to emission factors.

"Some areas are following what we expect, and some are not. It is apparent that roadside NO_x concentrations are not declining as the emissions inventory would suggest and this needs further analysis." He noted that a revised baseline forecast is expected to be published in October this year and this will incorporate the latest emission forecast.

He continued: "The national picture is based on modelling, and modelling doesn't always represent reality. We intend to go out and meet local authorities and set up a dialogue to get a better picture of what is going on."

Vaughan admitted that the air quality strategy – judged weak when released (*AQB Aug07 p1*) – is being 'refreshed'. It looks as though Defra is going to be far keener to encourage local authorities to do their bit for air quality improvement (although 2009/10 air quality grant is unchanged on last year).

Whereas the 2007 air quality strategy just settled on three macro-level policies (shipping, Euro standards and cleaner vehicles), the current thrust is for "the combination of national and local measures most likely to achieve compliance". It will be on these that Defra consults later in the year (see below).

Defra's proposed deadline for dealing with NO_2 flexibility

Date	Key Milestones
From June 09	Engage with major urban areas on measures and options and write to local authorities to confirm current measures Review concentrations using latest emissions data
From Sept 2009	Review position on extent and scale of exceedences and number of zones that require time extension
From Oct	Model further measures identified to achieve limit value
From Nov	Finalise draft time extension notification and impact assessment for publication
From12/09	Consult on further measures (12 weeks)
End Mar 10	Deadline for comments
From April	Revise Plan in light of comments received
From June	Finalise and submit notification
Early 2011	Commission decision notified within 9 months of submission

IN BRIEF

Ministerial shake up

Government wobbles has led to a shake up of the Cabinet and some official positions.

Hilary Benn remains as environment secretary, supported by Jim Fitzpatrick (responsible for air quality and noise, previously covered by Lord Hunt who has been moved to the climate change department DECC). The linkage with DECC has been severed, some believe this weakens the position of the local environment.

Meanwhile Berr (formerly the DTi) has been renamed BIS and is headed up by Lord Mandelson, strengthening the hand of business in the Government,

Epuk is concerned that further distance is now placed between the Government's work on air quality, the quality of the local environment and climate change: "When Defra lost responsibility for mitigation of climate change to DECC during 2008 we were assured that the two departments would co-operate closely, with the appointment of Lord Hunt as a joint minister providing a strong link between climate change, air quality and wider local environmental quality work.

"His move to DECC severs the link, ringing alarm bells that any concerns about local environmental quality issues will have less of a chance of being heard. As time moves on, close ties between current Defra staff and former Defra staff now at DECC, are likely to be eroded as officers move."

Rushlight set for 2009

The Rushlight Awards 2009 have now opened to entries. Now in their third year, the Rushlight Awards celebrate environmental excellence.

An air quality category will be "awarded to the most significant technological development or innovation that reduces or treats pollution in the air."

- More details on website www.rushlightawards.co.uk

VEHICLE EMISSIONS

Factors finalised at last

After a considerable delay, DfT emission factors have finally been agreed.

Draft factors were released last year (*AQB Aug08 p1*), new factors are eagerly awaited as existing factors appear to overestimate improvements due to new technology. Various initiatives are dependent on the new factors, including an update to the Highways Agency DMRB screening model.

Emission factors are used along with traffic forecasts to predict future emissions of new developments or policies. Factors have been blamed for gross overestimation of improvements in concentrations, especially in urban areas (*AQB May p2*).

This has been ascribed to a number of problems. Modern diesel engines may have less total NO_x, but a higher proportion of that NO_x is emitted as NO_2. And the actual performance improvements of modern technology is not as impressive as bench tests may suggest.

Dozens of supporting reports have been released as *AQB* went to press.

- More details next month

MONITORING

Report reveals FDMS teething problems

An AEA report commissioned for Defra and the devolved regions has revealed a number of teething problems with new FDMS particle monitors being installed into the automatic network.

The report admits: "There has been significant discussion and debate on problems encountered during commissioning and operation of FDMS analysers" Nearly 100 FDMS's have been bought by Defra to replace old-style Teom's which are no longer considered equivalent."

Problems listed include:

- Poor pump performance: "The vacuum is critical to maintaining correct analyser function, and it is noted that some pumps have failed prematurely. These were found to be of the incorrect mains frequency, and the supplier is working on replacing these with units more appropriate to UK mains supply. It is also important that where $PM_{2.5}$ and PM_{10} FDMS units are co-located, the flows must be within 3% of each other;
- Filter changes during reference cycle: It was found that opening the FDMS unit during the reference cycle allowed excessive moisture to enter the cooler unit, resulting in considerable analyser instability. The procedures have been updated to ensure the unit is locked in base mode whilst the door is open;
- Temperature instability: There have been several issues with air conditioning and heating being inadequate to maintain a constant temperature;
- $PM_{10}/PM_{2.5}$ comparison: With the introduction of $PM_{2.5}$ analysers, it is possible to compare concentrations with PM_{10}. In some cases, measured $PM_{2.5}$ concentrations have been higher than the PM_{10}, which is of course illogical. Careful examination of the data is required to establish which, if either, is correct;
- The performance of the FDMS drier is also critical to the quality of data. In some cases these have failed, resulting in poor quality data. The performance of the drier needs to be carefully monitored to ensure optimal data quality.

QA/QC Data Ratification Report for the Automatic Urban and Rural Network, October-December 2008, *and Annual Review for 2008* can be viewed on the reports section of www.airquality.co.uk

MONITORING

Bamtastic! North Lincs happy with monitors

North East Lincs council has lots to monitor as its patch contains the UK's largest port and the industrial town of Grimsby.

Following Defra's announcement that the Teom was no longer equivalent, it ordered Bams from Enviro Technology.

North East Lincs has three strategic locations where analysis occurs: two within the air quality monitoring area of Immingham and a third in the town of Grimsby. The council's Danny Fox took advantage of Enviro Technology's 'new for old' part exchange deal and replaced the equipment with three BAM 1020s.

"In the first 12 months using the BAM 1020s we have received an unprecedented 96.66 per cent of validated data," Fox explains. "The only downtime occurs when you are changing the filter – approximately twenty minutes every six to seven weeks."

The main benefit of the BAM 1020 is that when a new filter is installed it confirms immediately whether the set-up is successful. With other monitors, there is a four-stage post-change set-up which takes in excess of one hour. "It was not uncommon for staff to have to return to the site several times before the equipment was running satisfactorily, meaning that data was lost," says Fox.

- North East Lincolnshire's air quality updates can be accessed online at www.nelincs.gov.uk More information on Bams at www.et.co.uk

STANDARDS

US tightens NO_2 objective

US President Obama has pushed through a Bill that will pave the way for tighter NO_2 standards.

The Bill passed by a narrow margin and now the US Environmental Protection Agency is consulting on proposals for stronger hourly NO_2 objectives. The annual mean objective is unchanged.

EPA's proposed revisions apply to the primary NO_2 standard and would:

- Establish, for the first time, a one-hour NO_2 standard at a level between 80 – 100 parts per billion (ppb) (UK 105ppb);
- Retain the current annual average NO_2 standard of 53 ppb (UK = 21ppb);
- Add NO_2 monitoring within 50 metres of major roads in cities with at least 350,000 residents; and
- Continue monitoring "area-wide" NO_2 in cities with at least one million residents.

Kings College London's Frank Kelly was on the European WHO NO_2 standard setting group and told *AQB*: "The US tightening justifies continued vigilance on NO_2. Whether it has a direct or synergistic health effect or is simply a surrogate for other transport-associated pollutants is still a mystery and until this is resolved we need to keep it under careful control – the current limit value is our best estimate of how much control that should be to protect everyone including the most vulnerable."

VEHICLE EMISSIONS

Bus fleet emissions vary widely

A report prepared for Defra suggests that actual bus fleet composition may vary markedly across the country.

Air Quality Consultants compiled the report, it says: "Actual fleet composition with regards to age and Euro standard can differ greatly from the national assumptions that are used for most local authority air quality modelling studies. These variations in fleet composition can potentially have significant effects on NO_X and PM_{10} emissions and the modelled concentrations."

It adds: "Bus emission reductions strategies can be an effective tool for reducing NO_2 and PM_{10} concentrations. The most effective strategies are those that replace the oldest, most polluting vehicles, with modern low-emission buses."

Fleet turnover of buses is lower than other types of vehicle, so there are many older, high emitting buses still in service, doing most of their mileage in city centres where there are air quality problems.

The report looks at possible mechanisms for the implementation and enforcement of emission reduction strategies for buses – but admits effective mechanisms and guidance for introducing strategies are limited: "However, the Local Transport Act has introduced greater powers for local transport authorities to implement measures.

"To date, few bus emission reduction strategies have been implemented. Most of these strategies are within small historic towns and cities, where bus-related air quality problems are concentrated into a small area. The most effective measures are either statutory partnerships and/or those where external funding has been provided. Factors that influence the implementation and effectiveness of bus emission reduction strategies include the nature of the air quality problem, council structure, funding availability, individual bus operator attitudes and policy mechanisms."

It also notes that the current national modelling approach is not sufficiently detailed to identify many of these exceedence areas, as it does not take into account specific local characteristics such as congestion, street canyons and actual bus fleet composition. "Before any additional measures to reduce bus emissions are considered, an investigation of the scale of problem should be carried out." Monitoring of current initiatives and costing of bus measures should be undertaken.

- *Review of bus fleet compositions and implications for emissions reduction strategies* can be viewed www.airquality.co.uk

GENERATION

Biomass works for Stansted Airport

A biomass plant built to heat Stansted Airport is said to have worked well through the recent hard winter.

Biomass plants are being encouraged by planning guidance as a means of cutting CO_2 emissions, but have caused problems for local air quality (*AQB May p8*). Stansted says that its 'state of the art' woodchip boiler has out-performed all expectations and helped cut predicted annual gas consumption by nearly 40%.

Part of the £50 million terminal extension completed in 2008, the biomass technology was introduced to make the development carbon neutral and designed to support the gas fired boilers that have heated the terminal since its opening in the early 1990s.

However, performance since last November has proven so efficient that it is now the airport's primary boiler, and latest results indicate the biomass technology is set to help reduce predicted annual airport gas consumption at the airport by nearly 40%.

BAA says: "The introduction of biomass technology has by far been the largest contributor. We have one of the largest biomass boilers in commercial use for heating in the UK at present and cannot express enough how satisfied we are with its performance to date."

IN BRIEF

Recession help

Firms that mothball industrial processes are eligible for reduced price permitting.

Defra has introduced new arrangements allowing operators to request reduced annual subsistence charges for up to 24 months if they have temporarily mothballed their installation, or are operating below the level at which a permit is required, for a period of at least 12 months, and still want to retain their permit.

Once the local authority agrees to the request, subsistence fees are reduced by 60% of their risk rated fee for each full month that the qualifying criteria are met.

- *Guidance proformas and revisions to the charging schemes* www.defra.gov.uk/environment/ppc/localauth/fees-risk/fees.htm

Rights bid fails

A bid by Greenpeace to challenge German authorities on air quality has failed.

Local groups had attempted to take Hamburg authorities to court, but the action was repeatedly thrown out of local and national courts. It was then taken to the European Court of Human rights which accepted there were high pollution levels but also that local and national courts had the right to refuse to hear the application.

Climate change threat

Defra has released UK climate projections based on Met Office science, illustrating the extent of the changes the UK might face in the absence of global action to cut emissions – warmer and wetter winters, hotter and drier summers, increased risk of coastal erosion and more severe weather.

- www.defra.gov.uk/environment/climatechange/adapt/index.htm

Website review

Air Quality Bulletin will be repeating its popular website review this summer.

Don't let the usual suspects win again – start sprucing up your site!

IN BRIEF

German LEZ success

Measurements suggest air quality has improved as a result of a low emission zone in Germany.

Berlin introduced its low emission zone in 2008 and emissions of PM were seen to drop by 28%, and NO_x by 18%. particle concentrations in busy streets dropped by 3%, shaving four exceedence days off the yearly total. NO_2 concentrations dropped by 10%.

● More information on German low emission zones can be found on www.lowemissionzones.eu

Top green cars

The Environmental Transport Association has named and shamed the best and worst cars in terms of their environmental impact.

Its green car of the year is the Honda Insight, a family-sized hybrid that is providing stiff competition for the ubiquitous Toyota Prius.

It says the least green car was found to be the 8-litre Dodge SRT-10 sports car. "A year's driving in the Dodge emits the same amount of carbon dioxide as is absorbed by 322 mature trees – the equivalent of an acre of oak forest."

The ETA examined over 1300 models of car currently on sale in Britain and compared their power, emissions, fuel efficiency and even the amount of noise they produce to create a definitive guide to buying the greenest vehicle.

ETA explains why diesels do well in the survey despite there being known health effects: "The advent of diesel particulate filters (DPF) such as fitted to some of the category winners heralds a dramatic improvement in the environmental rating of diesels. DPFs remove virtually all trace of soot from the exhaust gases."

● A fully searchable database of the results and full details on each car will be published at www.greencarawards.co.uk

MONITORING

Good data or your money back

A monitor support firm is offering money back if its kit fails to work.

SupportingU says that if its monitors fail to reach a minimum of 90% data capture, it will offer refunds. AEA this month reported that across the UK automatic urban and rural network, data capture for 2008 was 91.1% but there were 39 sites achieving less than 90%

Richard Wyatt of SupportingU told *AQB*: "The premise is that we will guarantee a minimum data capture of 90% for all new contracts. If we fail to meet this our customer will be compensated for the inconvenience.

"This will be a pro-rata figure calculated from the 90% capture threshold. For example if our customer only received 80% data capture they would get 10% of the call-out contract credited to them. We have chosen 90% as the threshold as this is the figure required for AURN standards and therefore seemed a good benchmark.

"We pride ourselves on the level of service we provide and we don't envisage having to pay out any compensation. SupportingU's customers receive a very low number of call-outs due to the high level of routine servicing we deliver and therefore 90% is more than achievable. However, the point is that we're happy to put our money where our mouth is.

"Local authorities have an obligation to choose an equipment support unit that offers best value not just the lowest price. Whilst SupportingU remain competitive in the market it is not unusual for customers to choose a cheaper option only to end up forking out for additional parts that were not included in the contract or receiving a lower level of service which causes more failures and down time leading to huge gaps in their data.

"We believe we are unique in releasing independent call out data provided by Kings College ERG, which would undoubtedly help local authorities to make an informed choice."

● www.supportingu.co.uk

MONITORING

Scotland becomes clean, claims report

Scotland can boast that for the first time, mean NO_2 levels for both urban background and roadside/ kerbside locations in Scotland are below the strategy objective level of 40µg/m³.

The mean PM_{10} concentration for urban background levels is also below the Scottish annual mean objective of 18µg/m³ for the first time since records began in the early 1990's. The data is contained in a new report released by Scottish Government.

But while there successes, there are also concerns about urban ozone levels which have increased. This is due to the reduced levels of NO_2 which tends to scavenge ozone.

In a second report, the results of corrections to particle monitoring data were presented. Partisol data has been found to be incorrect (*AQB July 2008 p1*) and levels have been adjusted down by 4.5µg/m³ because of faults in field blanks, and a further 2.5µg/m³ because of filter media.

Conclusions include:

● Of the monitoring sites included in the Scottish PM_{10} and $PM_{2.5}$ gravimetric monitoring study, the annual average objective for PM_{10} was only exceeded at the Dumfries roadside site in 2007;

● For $PM_{2.5}$ all sites in this study were below the Scottish annual average air quality objective of 12µg/m³ with the exception of the Dumfries roadside site where the objective was equalled in the calendar year 2007;

● $PM_{2.5}$:PM_{10} ratios were 0.66, close to the arithmetic mean of 0.65 across Europe.

● *2008 annual report for the Scottish AQ database project* and *A report on the results of a gravimetric particulate monitoring study* can be viewed on www.scottishairquality.co.uk/reports

INDUSTRIAL POLLUTANTS

Epaqs finalises industrial standards reports

Experts have finalised standards for industrial pollutants such halogens and metals.

The Expert Panel on Air Quality Standards (Epaqs) has been studying industrial pollutants with a view to allow the Environment Agency to set safe limits. Last year it released draft reports for consultation (*AQB June 2008 p8*).

One paper sets out provisional guidelines for hydrogen iodide and hydrogen fluoride for protecting human health against chronic systemic effects. For hydrogen fluoride and dental fluorosis, the panel recommends that concentrations of hydrogen fluoride not exceeding 0.02ppm (0.016 mg/m³) as a monthly average, should protect against this aesthetic concern.

In relation to hydrogen iodide with the potential capacity to cause hypothyroidism, the panel recommends a guideline value of 5µg/m³ for hydrogen iodide as a monthly average to protect against hypothyroidism.

In Epaqs' other report on metals, it recommends:

● Arsenic – 3ng/m³ total inorganic arsenic in the PM_{10} fraction, as an annual mean;

● Nickel – 20ng/m³ total nickel compounds in the PM_{10} fraction, as an annual mean;

● Beryllium – 0.2ng/m³ total beryllium in the PM_{10} fraction, as an annual average;

● Chromium – 0.2ng/m³ in the Cr(VI) oxidation state in the PM_{10} as an annual average.

● *Addendum to guidelines for halogens and hydrogen halides in ambient air* & *Guidelines for metals and metalloids in ambient air for the protection of human health* can be viewed on the Epaqs website www.defra.gov.uk/environment/airquality/panels/aqs/

LONDON

GLA leans on consultants

Air Quality Consultants is to offer helpdesk-style assistance to London Boroughs under a new contract let by the GLA.

The contract comes as news emerges of heavy staff cuts within GLA's environmental team. Greater use will be made of outside consultants as mayor Boris Johnson diverts money towards his planned cycle hire scheme.

GLA's Simon Cousins told *AQB*: "Air Quality Consultants, in association with UWE, has been appointed by the GLA to assist in its role of supporting the London boroughs with their local air quality management activities. In establishing this new contract, the GLA recognises the important role that the boroughs have to play in helping the Mayor to improve air quality conditions in London, and to achieve the air quality objectives and limit values.

"Measures implemented at a local level within air quality action plans are seen as particularly important, and the GLA is keen to advise and assist the boroughs in the development and implementation of these plans as much as possible."

The project is being led by Stephen Moorcroft and Duncan Laxen of AQC who have both been working on air quality management and assessment in London since the 1980s. It will include carrying out appraisals of all review and assessment and action plan reports submitted to the Mayor. The appraisals will focus on issues of particular importance to air quality in London, including the requirements of the Mayor's air quality strategy. In addition, two workshops are to be organised, focusing on examples of best practice for LAQM in London, and the role that the London Atmospheric Emissions Inventory can play in assisting and improving reviews and assessments.

A London air quality helpdesk has also been set up to advise the boroughs on key air quality management issues within London, including measures that can be used to improve air quality.

● The helpdesk can be contacted by email at LondonAQHelpdesk@aqconsultants.co.uk or by telephone at 0117 973 7761.

ENGINE EMISSIONS

Major projects criticised on emissions

Exhaust clean up lobby groups have criticised organisers of the London Olympics and Crossrail for failing to adopt best construction practice on emissions.

The Environmental Industries Commission says developers are avoiding full implementation of the *London best practice guidance on the control of dust and emissions from construction and demolition*.

Cross party MPs recently tabled an Early Day Motion calling for all major construction projects, including Crossrail, to implement the guidance by ensuring that the most polluting machinery used on site is fitted with suitable pollution control technology.

EIC welcomed Crossrail's commitment to "implement measures to control and limit emissions which will affect some residents and other sensitive receptors as far as reasonably practicable" but adds: "We believe that Crossrail could demonstrate environmental leadership by extending this commitment to full implementation of the best practice guidance."

EIC has also complained to the Olympic Delivery Authority about the same matter. EIC says that the ODA originally pledged to abide by the London construction code: "Despite your commitment to minimise these harmful emissions through implementation of London best practice guidance, the Olympic site has failed to deliver. This is hugely disappointing for an Olympic games that had promised to be the greenest ever.

"Construction started on the Olympic site in April 2006. Over three years later we have not only been informed in writing that the ODA 'hasn't retrofitted any plant on site' but that only now it has made a 'decision to undertake a pilot study on a live site with a range of machines and plant hire contractors'. Starting a pilot study now is unacceptable when there has been a commitment from day one to comply with all aspects of the London Best Practice Guidance," says EIC.

GREENHOUSE GASES

Guidance released on totting up CO_2

Defra and Decc has released a consultation on guidance on how to measure and report greenhouse gas emissions.

The guidance published under the requirements of the Climate Change Act 2008 outlines a "simple and clear step-by-step process" on how an organisation should calculate its own corporate carbon footprint. The guidance will be published after the consultation by 1 October 2009.

Environment secretary Hilary Benn said: "This guidance is voluntary but by 6 April 2012 the government must introduce regulations requiring the mandatory reporting of greenhouse gas emissions or explain why this has not happened."

It is estimated that the exercise takes 28 hours for a firm to complete.

● The consultation document and guidance are available at www.defra.gov.uk/corporate/consult/greenhouse-gas/index.htm

IN BRIEF

Cancer study update

The US Health Effects Institute has published an extended analysis of the American Cancer Society study of particulate air pollution and mortality.

Research Report 140, describes a recent analysis of the original ACS cohort, a large ongoing prospective study of mortality in adults that started in 1982 and has played a central role in the setting of US air quality standards $PM_{2.5}$ in the US as well as assessments of benefits from PM reduction worldwide.

The new study describes for the first time work by Dr. Daniel Krewski and colleagues to increase the follow-up period to 18 years (1982 to 2000) and extend the range of analyses to include innovative refinements of statistical methods and incorporate sophisticated control of bias and confounding.

● Report 140, and a commentary by the HEI review committee can be viewed on www.healtheffects.org

AAMG paper call

Measurement group AAMG is calling for papers for its Christmas air quality conference.

This year's conference will be themed around EU limit values compliance issues which are most acute for particulate matter, nitrogen dioxide and ozone, leading to breaches of Directive requirements.

Organisers add: "In addition to these regulatory issues, air quality issues are gaining a high profile in several specific cases such as airports, shipping and major international events such as the 2012 Olympics. The conference will focus on these challenges and how technology and regulation should be adapting to address the challenges of the future.

● The deadline for the submission of an abstract for an oral or poster presentation has been extended until 17th July http://rsc-aamg.org/Pages/Meetings/MAA2009.html

IN BRIEF

Shipping consultation

Government is consulting on tighter fuel standards for shipping fuels.

Regulations concern:

- The maximum sulphur content of marine fuels used in SO_x emission control areas (SECA) and by passenger ships operating on regular services to or from Community ports;
- The maximum sulphur content of marine fuels used by inland waterway vessels and ships at berth in Community ports;
- Trials and use of new emission abatement technologies;
- Sampling and analysis of marine fuels to monitor compliance and enforce the regulations.

Draft Merchant Shipping (Prevention of Air Pollution from Ships) (Amendment) Regulations 2009 can be viewed on www.mcga.gov.uk/

Shipping emissions studied by MPs

MPs on the Environmental Audit Committee have scrutinised the issues surrounding pollution and CO_2 emissions from shipping. MPs says UK policy lacks coherence.

On air quality, MPs share the International Maritime Organisation's belief that shipping emission standards agreed last year will make a difference: "The International Maritime Organisation has made encouraging progress on limiting the emissions of particulate matter and harmful gases other than CO_2.

"The Government must ensure that the tighter regulations agreed are adhered to in practice. The Government should assess the case for mandating the provision of shore-side electricity for ships to improve air quality in the UK.

"The Government ought to consider extending stricter air quality regulations to all coastal waters around the UK."

- *Reducing CO_2 and other emissions from shipping* can be viewed on www.parliament.uk/eacom

CONSULTANCY MARKET

Slump affects green consultants

Environmental consultants have been ranked in a new in-depth survey carried out by Environment Analyst Publishing & Research.

The report concludes that the UK environmental consultancy sector grew by 9% in 2008 to reach a turnover of £1.46bn. This marks a deceleration on the average 13% annual growth between 2004-07.

It notes that consultancy tends to lag in economic cycles due to work signed off in the pipeline months in advance, so it was not until the last few months of 2008 when the tide turned and environmental consultancies were suddenly struggling to keep all of their staff busy.

Environment Analyst's market research has identified over 500 companies active in the environmental consultancy sector employing more than 25,000 people.

The UK sector remains highly fragmented, with some two dozen firms achieving UK environmental consulting revenues in excess of £20 million.

The top ten, in order of market share, are RPS, AEA, Atkins, RSK, Entec, Jacobs, ERM, Mouchel, Mott MacDonald and Arup.

Behind those follow WSP, Aecom, Halcrow, Hyder, MWH, SLR, WYG, Enviros and URS.

Environment Analyst believes that 2009 will be one of the most challenging years British environmental consultancies have ever seen, with firms projecting an average drop of 7% in their revenues in the current financial year. Overall market growth will be flat this year, increasing by low single digits at best.

The most resilient areas will be climate change and energy, ecology/landscape and waste management services.

- *Market assessment of the UK environmental consulting sector 2009* is available to Environment Analyst's Market Intelligence Service customers via the website, www.environment-analyst.com/intelligence

PLANNING ACT

Call for clarity in new planning procedures

Epuk and Lacors have expressed concern at the "inadequate protection for local communities" in the 2008 Planning Act.

They say: "Councils want to act in the best interests of local people and need time to consult on issues relating to major projects. There can be serious impacts from noise, dust, smoke, odour and light from major infrastructure development and local people should be able to have their say. But with the current 28 day consultation period, and weakened protection from nuisance, there is a fear that communities will be left suffering from poorly planned large scale developments such as power stations.

The two groups are urging the government to include the following:

- Guidance on what constitutes a realistic consultation period for major developments (13 weeks is preferred);
- An additional model condition requiring the periodic review of the schemes required to manage and mitigate against nuisance – this will ensure that unforeseen problems are adequately addressed, and that the local environment is protected;
- A mechanism for dealing with complaints that arise regarding any development – as part of a requirement that continued and open dialogue is maintained between builders and developers, and the community;
- Reference should be made to existing guidance and codes of practice for managing the impacts on, and quality of, the local environment.

Epuk says: "We accept that some short-term impact is an inevitable consequence of any development, but local nuisance impacts are manageable by proper planning and operation. We do not believe that respect for the quality of life of neighbouring citizens should present a barrier to necessary and appropriate development."

South Yorks rewards air quality champions

South Yorks Care4Air initiative has held a high profile awards night to recognise local air quality champions.

Over 30 nominees were shortlisted this year across five award categories: Individual; Community; Education; Business; and Outstanding Contribution to Improving Air Quality.

Sheffield-based Chesterfield Special Cylinders won the Business Award for their development of compressed biomethane.

Outstanding Contribution to Improving Air Quality went to Sheffield winner, Neil Parry (pictured receiving the award), project co-ordinator from the East End Quality of Life Initiative. Parry was chosen for his dedicated work monitoring air quality, a task he first began in Tinsley 11 years ago. He is credited with pioneering community air quality testing across the whole city.

The significance of significance

Members of the Institute of Air Quality Management met last month to debate significance. Jack Pease was there and sampled the mood

What is the meaning of life. Discuss. Such a question may appear in an imaginary GCSE paper and prompt wide and varied responses.

And so it is if you gather together a few dozen air quality professionals to discuss significance of air quality impacts in terms of planning. The question was posed at an Institute of Air Quality Management (IAQM) meeting last month with the aim of providing their opinion on significance.

The debate was passionate. In the roomful of consultants (bar two lonesome local authorities), consultant after consultant tut-tutted about existing Epuk guidance on planning and air quality which contains a table on significance. They report being ripped apart by lawyers at public inquiries if a 0.1μg/m^3 change in predicted concentrations tips a project from a moderate adverse category to substantial adverse.

The IAQM, as a relatively young body, is keen to flex its muscles and having assembled a high proportion of the country's air quality notables in one room, there was some support to the idea that significance should be down to 'professional' judgement and not a simplistic tick-box table in some 'pressure group's' unofficial guidelines. One delegate demanded that only IAQM members should be allowed to determine significance, an interesting concept that should raise eyebrows among local authority air quality practitioners who thought being members of CIEH was good enough.

It's worth stepping back a moment and defining what the significance debate is about.

Nowadays developments, whether it be a new road, a house or a large commercial development, must consider the environment before they can get planning permission. Air quality is part of that both in terms of the impact of the development on air quality, and the impact of air quality on users of the development.

For the latter, it is relatively easy to decide whether or not it is acceptable to bring people into an area. If air quality is below limits, no problem, if its way above limits, that is unwise, if it's a little bit above limits, then there are ways of making the development 'safe' for future occupants.

In terms of the impact of the development on air quality, that is more problematic. Decision makers have to decide whether a development will worsen air quality, and whether that worsening matters. In short, whether the impact is significant.

This debate is complicated, and prompted Epuk's 2004 *Development control: planning for air quality guidelines* (revised in 2006). These set out how a development can be assessed, whether impacts are significant with some advice on mitigation.

That guidance tries to make the process more transparent. It is easy to say that a new house in an unpolluted rural area has no significant air quality implications. It is easy to say that a large traffic-generating development in an air quality management area is hugely significant. The area in between is grey (and keeps IAQM members and planning lawyers in business).

The Epuk guidelines tried to rationalise the debate by considering the percentage worsening of air quality, and translating this to an impact chart couched in terms of negligible, slight adverse, substantial adverse and very substantial adverse. But consultants report problems with this approach.

For instance Sarah Horrocks of Atkins pointed out that a 5μg/m^3 impact in a rural area might translate to a doubling of concentrations, translating to a large impact according to Epuk's significance chart, while a 5μg/m^3 increase in an already polluted area will be considerably less in percentage terms.

This led to a call for impacts to be reported in micrograms rather than percentages. But the downside of this approach is that a microgram in high polluted areas is more significant than a microgram where levels are below limits.

Another idea floated by Horrocks was to use the concept of headroom – how much does a development use up the available headroom between existing air quality and the limit? The downside to this concept is that it only works in areas below limits. And while the some may be comfortable in raising air quality up to the limit, others are keen to avoid worsening air quality even if below limits.

Some were keen to simplify the debate and refer to impacts as either significant or insignificant. ERM's Roger Barraclough suggested it should simply be a binary yes/no decision, not one cluttered up by various terms contained within the Epuk guidance.

Delegates pointed out the downside to such an approach. Local authority decision makers, and environmental impact assessment (EIA) managers must balance impacts from various sources, eg noise, biodiversity, landscape. If all are reported simply as significant or insignificant, it is very hard to form a view as to which impacts are more important than others.

Some wanted rounding of impacts to the nearest 1μg/m^3. "Is there a change that is so small to considered significant?" asked Peter Brett Associates' Claire Holman. "There should be a minimum concentration above which there may be a significant impact."

Air Quality Consultants' Duncan Laxen's own firm has adopted the Epuk guidelines as company policy. Given that Laxen wrote the guidelines, that's not a great surprise, but he is putting his money where his mouth is.

Being so closely associated with both the guidelines, and the air quality review and assessment process more generally, does mean that Laxen risks being the bête noire of consultants. Some argue that Laxen is too quick to produce over-complicated guidelines for planning and other matters. The criticism may simply show that Laxen has succeeded stopping consultants and their developer clients from getting what they want too easily.

And even those that have a problem with the guidelines cannot sensibly blame Laxen for the weight given to those guidelines. Delegates reported that the guidelines are being used in the UK and abroad for developments for which they were never designed.

This is because there are few alternatives – they were produced to fill a void, and now the void is filled, they are being relied on heavily according to many consultants. For instance case studies were inserted into the guidelines to make them easier to understand – but these case studies have become de facto policy. Delegates pleaded that revamped guidelines include more examples, or none, in order to reduce the chance that random examples form policy through the back door.

No pressure on Laxen and the team drafting the updated guidelines then! Especially as the IAQM audience seemed totally unable to come up with a coherent better alternative despite three hours of talks.

Laxen tried to focus the discussion by listing the challenges involved with significance criteria and wider development control guidance. These are:

- How to incorporate numbers of people exposed to: a) changes in pollution levels and b) levels above standards;
- How to describe overall significance where there are both increases and decreases (as can be seen in WebTAG guidance);
- Are magnitude descriptors at right break points?;
- Should magnitude be expressed as absolute micrograms rather than in percentage terms;
- Should going from below to above objective be given different significance?;

● Continued on page 10

Significance: continued from previous page

- What about $PM_{2.5}$?
- What about significance descriptors for low concentrations, eg. how can a 'very large' increase in annual mean NO_2 from 4 to 5.5µg/m³ be a moderate adverse impact?

He finished by reminding the audience that the guidelines came about because in the "bad old days" there was huge inconsistency. "The NSCA guidelines came to the rescue".

Some may baulk at Laxen's use of the word 'rescue', after all there remains a huge inconsistency with London Councils, guidelines on planning and air quality. London Councils' guidelines use air pollution exposure categories based on objective thresholds. Using these, for instance, 40 sq km of London would be a no-go zone for development, a view far more prescriptive than Epuk guidelines.

For all the argy bargy among the gathered consultants about the Epuk guidelines, the guidelines have prevented very little, as Arup's Michael Bull pointed out on last year's Greenwich Thames boat cruise (*AQB April 2008 p6*).

That meeting focused on planning, and Bull said then that given the importance of air quality in planning, there should have been more planning refusals. At that point there had been only five refusals on air quality grounds over the ten year period.

Bull said then that the guidelines were weak. And yet the mood of the latest IAQM meeting appeared to suggest that the significance guidance was over prescriptive, overcomplicated and detracted from the need for professional judgement.

Do consultants want to weaken the guidance still further so they can concrete over the whole of Britain? Or is their desire for change good for air quality?

VOX POP: IAQM DELEGATES TELL AQB THEIR THOUGHTS ON THE SIGNIFICANCE DEBATE …

We caught up with IAQM members after the debate and asked for their opinions:

Steve Moorcroft, Air Quality Consultants

I think the guidance we have generally works well, but there are some areas where it could be improved e.g. perhaps moving away from a percentage change in concentrations to an absolute change (in µg/m³). We should probably also change the notation from one that directly implies significance to one that makes it clear "moderate adverse" is a descriptor of the impact. This still then allows professional judgment.

I personally think all of the issues of uncertainty are a red herring – there are many uncertainties in modelling, but when you are addressing an incremental change (due to a road scheme for example) many of those uncertainties are cancelled out as they are the same for the "do nothing" and "do something scenarios". To mask the effects by rounding the numbers I think is inherently wrong and misleading.

Despite the many views raised, no-one (as yet) presented an alternative scheme that would work.

One issue that does need to be considered carefully though (and this perhaps belongs more in the Epuk guidance) is the issue of mitigation. If we were to have criteria that eg. classify a 5% increment (or a 2µg/m³) change in NO_2 concentrations as not significant, even where the levels are above the objective, we potentially run the risk of making achievement of the objectives very difficult.

It can be easy to dismiss a 1 or 2 µg/m³ change as being very small, but when you look at measures you have to put in place to reduce levels by this amount, it becomes very challenging. To put this in context, the London LEZ reduces annual mean NO_2 concentrations by a maximum of about 1µg/m³. In that context a development in central London that increased NO_2 concentrations by 1 µg/m³ would offset the LEZ benefits (albeit only within the area affected by the scheme).

I think we have to consider mitigation included for all schemes in areas of poor air quality, even where the impact is small.

David Harvey, ADM Consultants

My view is that it is not sensible to try and tie down these criteria/descriptors to actual numerical values. If you do, you are bound to fail.

While one might be able to concoct a set of criteria that gives one something sensible for most situations, there are bound to be circumstances where they don't work. One may have a development where the impacts on air quality are benign or significant but the guidance makes you describe it in terms that are misleading. Or you get ludicrous situations where one is debating at an inquiry about the merits of a 0.1µg/m³ change because the guidance puts the impacts into a different box.

I don't see what is wrong with presenting the predicted impacts in the context of the predicted change, the estimated baseline and the assessment criteria. It is for the local authority officer to make a judgement on whether the development is acceptable or what mitigation is required. If I were an EHO reviewing an air quality assessment I would make a judgement based on the predictions and the assumptions and not pay any attention to how the consultant chose to describe the predictions.

The guidance which we have has many failings and does not even work for NO_2. For industrial sources it is often the short term impacts that are of most concern and yet for a process that has a large impact say (100µg/m³ 99.8th percentile of hourly average NO_2), if one went to the trouble of adding the hourly predicted concentration to the hourly measured concentrations and calculate the resulting 99.8th percentile (ie process + background) there may be no change because peak hourly impacts from the process occurs under different meteorological conditions than peak ambient concentrations.

Sarah Horrocks, Atkins

We agree that a common language is needed in order that professionals and lay persons alike can interpret and understand effects of air quality on its own and in the context of lots of other environmental disciplines.

Currently the guidance recommends a percentage change in ambient air quality to determine magnitude of effect. But the change should be actual not relative to ensure consistency within and across assessments. For example. if background in one area is 20µg/m³ and in the other it is 40µg/m³, then a percent change will give a different magnitude descriptor for the same change.

In interpreting significance, consideration should be given to the fact that the NO_2 objective is based around a threshold of effect, which is not the case for PM_{10} – can a change that occurs well below the NO_2 objective be called significant on health grounds (which is different from LAQM purposes)? Do we need two separate approaches?

The guidance as it stands is not easily applied to a scheme where there would be a variety of effects across the study area, for instance a bypass may increase concentrations near the new road itself (which would normally be a much less populated area) and decrease concentrations through a congested town centre (with higher exposure). On this basis, applying significance criteria to just the worst affected property is not fully representative of effect of the scheme.

Michael Bull, Arup

I think you could probably break people down into three main camps:

1/ People who consider that any assessment of significance should be left to professional judgement – a professional person should be able to make their own mind up whether something is significant;

2/ People who consider that the assessment of significance can only be described as 'significant' and 'not significant' – with no descriptors of anything in between like 'moderate adverse';

3/ People who are comfortable with the idea of significance criteria (however, there are probably huge gulfs between this group of people in terms of what the criteria should be).

From my point of view I can see why some people (particularly planning authorities) like having the significance criteria because it allows a non-expert to get some idea of what the outcome of an assessment is. From personal experience I also know that on occasions you are forced down a route of using them (usually because your lawyer or EIA co-ordinator insists).

For that reason we have tended to use the example in the Epuk guidance, the main reason for this choice simply because we can point to a third party publication that has some authority (albeit that the document only details these criteria as "examples"). I have no problem with the significance criteria in the guidance in terms of the overall idea used – that is basically that the scale of impact relates to the extent of change and whether you are close to the standard or not. Such an approach is sensible and probably the basis of most significance criteria applied for air quality assessment in the past.

"However, the practical application of this type of criteria is much more difficult because they rely on the modelled numbers to be interpreted as absolute values. This creates a real problem as naturally a very high level of significance is attached to when you go from a situation under the standard to one above the standard, say 39.8 to 40.2 $\mu g/m^3$ (and this has actually happened to us). Taking the Epuk advice this would give a moderate adverse impact for a small change. I believe a professional interpretation of this situation would say the there's a very high chance that you will breach the objective before the scheme, the situation afterwards suggests the same – maybe slightly increased chance.

The trouble being, that the accuracy of the modelling not good enough to discriminate the level of changes required by the criteria, given that modelling may only be +/- 20% accurate but you're looking at changes of a couple of percent.

You then get into an uncomfortable situation in a report where you have to explain the outcome from using the guidance but then have to back track in the text by providing a 'professional judgement'. However, rather naturally the guidance carries some weight and your own 'judgement' looks weak.

I would fall into the camp that you should only apply significance criteria if you absolutely have to. I think the decision flowchart in the guidance is much more useful for a local authority planner because it reflects better the way planning works. That is, that a factor that is a 'material consideration' in a planning decision is not generally considered in terms of a yes/no answer – the planning officer or committee needs to weight numerous factors in their decision to come to a final decision about any particular planning application.

Therefore, I see it as useful to them to know the relative importance they should apply to air quality in a decision but allow them to balance this against all the other factors involved.

I also think the approaches being championed by the Low Emission Strategy group are well worth applying further. The guidance is more about achieving air quality improvements (or maybe less deterioration) in planning by providing appropriate mitigation.

Part of the guidance is the suggestion that s106 payments should be partly tied to the emissions created by the application, so, for instance, Mid Devon's Supplementary Planning Document actually charges on the basis of trips generated and the commercial viability of the project (so affordable homes pay nothing, and a supermarket a lot).

The money raised is all put towards funding the council's air quality action plan. The developer can reduce payments by showing they have included in their scheme measures that offset the emissions generated by traffic.

"I think this is a pretty good thing as it drives the development to include measures to reduce emissions in its design, and you get money towards air quality improvement too. The approach acknowledges that air quality rarely stops development, but that you can use development to work towards better air quality. These approaches are in their infancy but I can see them being used much more.

Matthew Ireland MNA Advisory Ltd

In my view, the existing guidance appears, in the large, to work quite well. If it ain't broke, don't fix it, so minor tweaks would appear more appropriate.

Additional guidance is required on summing results of receptors that show, for example, a 'minor benefit' and those that show a 'minor adverse impact'. A simple summation would work, taking account of the magnitude of impact at each receptor, but only if all residential receptors modelled. Often, only representative receptors are modelled.

Additional guidance is required on assessing the extent of mitigation that should be required and how this would affect the significance score, and additional guidance is required for $PM_{2.5}$.

Most, if not all of the discussion followed similar lines to discussions when the original guidance was written. What we should remember is that the guidance advocates the use of the decision flowchart and 'experienced officer opinion'. This flowchart forms the backbone of the guidance. It is, I believe, why the guidance works.

Sarah Hodgson, Teignbridge

I feel that the significance criteria or some sort of assessment is necessary for determining the scale of the air quality impact of a development. The planners basically need to know whether an application should be refused outright, approval should be recommended subject to a section 106 agreement and/or approved subject to air quality conditions. Further guidance on professional judgement would help as this could be cited in Public Inquiries including examples of air quality planning conditions that have been tested and approved by planning inspectors.

I think it would have helped if there had been more representatives from local authorities to give our viewpoint. I also believe that those local authority officers appraising the air quality assessments should be a member of the Institute of Air Quality Management or have a specific air quality qualification.

Before I specialised in air quality, I was a noise officer and it was almost impossible to win cases on statutory noise nuisance without a qualification in acoustics. I was required to complete the Diploma in Acoustics and become a member of the Institute of Acoustics.

David Muir of Muir Environmental

A major point in the discussions seemed to be the question of "What is the target audience for the guidance?" and, at least originally it was mainly the local authorities and in particular those where someone, maybe with relatively little knowledge of air quality issues, was struggling to balance local air quality management with food inspections, health and safety and whatever else could be loaded onto them.

It was also intended to provide guidance in a field that, then, was not covered by any other bodies. In contrast the IAQM meeting seemed to be looking at very specific issues.

Several things did come out, one being that the guidance is being used in many other countries. Another was that it seems that what were intended to be examples are being taken by lawyers and others as being set in stone; certainly not what intended originally. This led to a plea for more examples to be included to show that alternative views are possible.

Another issue raised was that the guidance seems, to some people at least, to concentrate on traffic issues. Again this was not the original intention but given that most AQMAs are traffic related it is hardly surprising that this may be the case.

Another interesting thread was the question of whether to use percentage changes or absolute changes in pollutant concentrations. This was linked with the question of whether a $1\mu g/m^3$ in NO_2 at a location where the ambient concentration is very low should be considered at all.

● Continued on page 10

6% it is then

UK medical experts settle on a 6% risk estimate of dying from air pollution. But is it enough asks Jack Pease?

Two years ago Comeap released a draft report explaining in exhaustive detail why it felt 6% was the magic number for the number of people dying from fine particle air pollution.

Comeap – the Committee on the Medical Effects of Air Pollution – was being hurried to produce the estimate as the Government was wanting to publish its air quality strategy. The strategy adopted this figure, but contained very little in the way of action to do anything about it (*AQB August 2007 p8*).

Now Comeap has finalised its report into mortality – resisting calls from respondents to its draft to adopt a higher figure than 6%. There is a growing feeling outside of Comeap that fine particles are very dangerous. The 6% has caused a bit of a fuss, not least among peer reviewers of the report as well as the usual suspects.

What is the significance of the 6%? Air quality policy is driven by cost benefit analysis, only if you can put numbers to the effect of air pollution can you show a benefit that will justify the cost of doing anything about it.

The 6% refers to the increase in the number of people that will die for a 10μg/m^3 rise in $PM_{2.5}$ concentrations. This is a long term effect, rather than those that die in the 'short term', for instance where the air pollution prompts a heart attack.

Prior to the 2007, the favoured impact level was 3%, and before that 1%, which justified little if any action. The increase to 6% started to make the air quality strategy far more important. But there is evidence from the US and Europe that the 6% is not enough, and that Comeap should have opted for a range of estimates with 6% the lower limit, and 17% as the upper limit.

Those arguments have hardened in the years since the draft report was put together by Comeap, and some had hoped that the final report now published would acknowledge the evidence for a higher figure – if only on a precautionary basis.

However the latest report is much the same as the draft released two years ago (*AQB August 2007 p12*). There's a lot of medical mumbo jumbo contained within the near-200 page document, most of which explains how the risk factor was agreed.

The method chosen was novel – get the Comeap committee members to vote for their favoured risk estimate and then average this, and use the differences in opinion to state the uncertainty. If you think this is a bit hit and miss, you are not alone.

Committee members had to base their decision on key American studies such as the American Cancer Society (ACS) study, itself based on several hundred thousand people across many US cities. This shows a rise in the death rate when there is more $PM_{2.5}$, the issue of exactly what causes these deaths – so called causality – is not addressed.

Comeap chairman Jon Ayres introduces the finalised report: "This report is the first of a new series recording the results of our second visit to the difficult problem of quantifying the effects on health of exposure to air pollutants in the UK. Our first report, published in 1998, dealt only with the effects of short-term exposure to selected air pollutants.

"Quantitative data relating to the effects of long-term exposure were beginning to appear in the 1990s and we recognised that had we used these in estimating impacts on health in the UK a significantly larger estimate of effects would have been produced. But, at that time, we were uncertain about the applicability of these data to the UK and we limited the scope of our work accordingly. We returned to the problem in our second report published in 2001. In this we considered advances that had been made since 1998 and provided some provisional estimates of the effects of long-term exposure to particles in the UK.

"The current report is an expansion and extension of our earlier work. We have been encouraged by the publication of studies from the UK and elsewhere in Europe and note that these have confirmed the findings of the US studies that we considered in our early reports. Our work has allowed estimates of benefits of reducing levels of air pollutants to be included in the UK air quality strategy.

"The effects of long-term exposure to air pollutants on mortality are well recognised and well studied. We know less of effects on morbidity, but this is also very important in terms of impact on public health. We are currently working on the second of this new series of reports: it will deal with effects of exposure to air pollutants on morbidity."

As well as agreeing on an overall 6% factor for $PM_{2.5}$ (see box), discussion within the report looked at other metrics that might affect toxicity: "We accept that there may be variations in toxicity, per μg/m^3 of pollutant, between the various components of $PM_{2.5}$. However, we have not recommended the quantification of the effects of components of $PM_{2.5}$ separately. In particular, we have looked in detail at the case for treating particulate air pollution measured as 'sulphate' differently from $PM_{2.5}$ but have not been convinced that the available evidence warrants and enables this. We see 'sulphates', as measured, as representing the formation of toxicologically active species such as sulphuric acid from sulphur dioxide emissions from the burning of sulphur containing fuel."

Comeap has released its final report along with peer review comments and responses to the draft from the public and lobby groups. Not all the peer reviewers agree with Comeap.

Professor P K Hopke from New York Clarkson University states: "It appears that an important publication on the follow-up of the Harvard Six Cities Study has not been included and it needs to be incorporated into

COMEAP'S KEY CONCLUSIONS ON $PM_{2.5}$ AND DEATH

"It is our view that the associations reported in the literature linking long-term exposure to particulate air pollution, represented by $PM_{2.5}$, and effects on mortality almost certainly represent causal relationships in respect of the air pollution mixture of which $PM_{2.5}$ forms part, and are highly likely to be causal in terms of particulate air pollution specifically. In saying this we note that there is a small possibility that some or all of the reported associations represent the effects of some as yet unidentified confounding factor or factors.

Our recommendations for the individual coefficients that express the relative risks associated with a 10μg/m^3 increase in $PM_{2.5}$ are:

For all-cause mortality:

Best estimate 1.06 with 95% confidence interval (CI) 1.02–1.11.

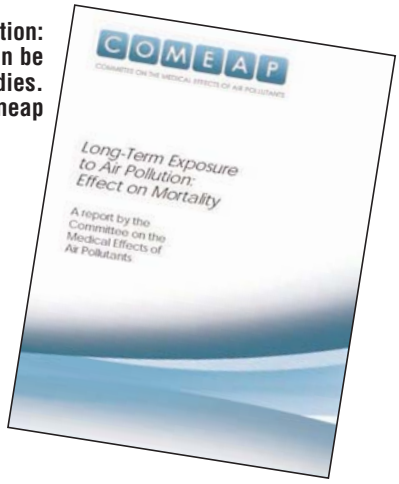
It also recommends explicitly use of high and low estimates, including that the wide interval of 0 to 15% (relative risk 1.00 and 1.15) be included in any report on quantification of risks from long-term exposure to particulate air pollution represented by $PM_{2.5}$.

For cardiopulmonary mortality:

Best estimate 1.09 with 95% confidence interval (CI) 1.03–1.16; we did not assess a range of plausibility.

For lung cancer mortality:

Best estimate 1.08 with 95% confidence interval (CI) 1.01–1.16; again, we did not assess a range of plausibility.



Long-term exposure to air pollution: effect on mortality (final report) can be viewed on www.advisorybodies.doh.gov.uk/comeap

this review. Laden et al (2006) report an 8-year follow-up on the original Six Cities analysis. During this interval, there has been a significant decrease in $PM_{2.5}$ concentrations that provides clear evidence for the role of PM in mortality. These authors found relative risk values near the higher ends of the confidence intervals obtained from the ACS study. Thus, these results require some of the consideration of the feasibility analysis that moved the analysis away from the upper end of the range.

"In spite of its use both in this analysis and in the United States, I find the elicitation of experts to be an approach that involves too much subjectivity and is likely to be unreliable. I would suggest one be very careful using the guesses of experts as the basis of policy decisions."

Dr Bart Ostro of the California Environmental Protection Agency says: "I will argue below that there is substantial evidence for using a higher coefficient than that suggested by this assessment. In addition, if you intend to use the results of the elicitation of members, you need to more fully document the interview process, selection and expertise of members, questions asked, biases addressed, sources used, peer review and complete results."

Ostro reports the US expert study group recruited to decide what the coefficient was, and the special care take to ensure that group wasn't unduly influenced by it's sponsors (the US Environmental Protection Agency). He reports: "Comeap has used for its estimates a 6% change in mortality per 10µg/m^3 change in $PM_{2.5}$, the median estimate of the experts was from 7 to 16% per 10µg/m^3 change in annual average $PM_{2.5}$ concentration. Experts in this study tended to be confident that $PM_{2.5}$ exposure was causally associated with premature death."

Results from the industry and the public are as could be expected. The power generation industry, creator of much sulphate, argued that sulphate wasn't to blame.

The oil industry poo-pooed the ACS study and suggested evidence should be based on a new UK study. That'll delay things by a good few years then! The chemical industry emphasised that Comeap conclusions were 'opinion based' and this should be more clearly emphasised.

Max Wallis of Friends of the Earth Wales says: "Comeap has a record of undercounting – in 1998 Comeap discounted long term (chronic) effects as too uncertain, in 2001 they accepted that PM probably caused chronic mortality, but decided the coefficient value of 1% was "most likely". In January 1996, in an interim report they upped it to 6% after reviews in the EU fixed on the range 2 to 11 %.

"The latest report quibbles about the endpoints, but essentially accepts the range 2-11% of 2005 as well as sticking to the 6%. Yet already in mid-2006, the range 6% to 17% was established by the US work.

Wallis continued: "Comeap admits its report is out of date and make no case for departing from the findings from more thorough and up-to-date analysis in the USA, produced by an expert panel chosen specifically for its breadth of expertise and independence. How can government use this report as a basis for policy when it has failed its peer review?"

Opinions on the IAQM significance debate, from page 11

Also the question of whether modelled concentrations should be rounded to the nearest, or next highest, round number rather than to one or two decimal points reared its head. This led to a sideline on how accurate modelled concentrations derived from modelled traffic data are.

Claire Holman, Peter Brett Associates

It was a great opportunity to hear many different views on the Epuk significance criteria, and how we can, collectively, make them better.

"I believe we need to agree a level below which there is no significant impact. There are large modelling uncertainties, even with verification, and we should be rounding up the data to the nearest µg/m^3 in our air quality impact assessments to avoid spurious precision. Concern has been expressed that if the data is rounded any change of less than 1µg/m^3 will be deemed insignificant. One way around this is to estimate the impact of a development before rounding the data. This would mean than any change of 0.5 µg/m^3 or more would be significant. We would then need to determine the degree of significance. Whatever the outcome of the debate, we must be allowed to use our professional judgement.

Duncan Laxen, Air Quality Consultants

We believe the guidelines can be updated to meet most concerns. There would be a magnitude of impact table (as now), modified to be based on absolute changes in µg/m^3 not percentages, then a table that allows the impacts to be described in relation to the air quality objectives (an impact descriptor table – essentially the existing table, perhaps with some modifications to take account of the concern that there should be an insignificant level – which is called negligible), and then the new bit would be a requirement to use these descriptor tables, which describe impacts at different receptors, together with information on number of people who may be exposed, to pull together an overall statement of significance of the air quality impacts of the development, which will be based on professional judgement, with the outcome ranging from insignificant, through minor and moderate, to major significance – or maybe insignificant, tolerable and intolerable.

In other words make clear the controversial second table is not a significance table but a descriptor table, and that significance takes all the information into account to reach a significance conclusion.

This may or may not remove the need for a separate local authority decision flow chart. I do think it is best to keep the distinction, as professional judgement can reach different conclusions on the same data – how would public inquiries work otherwise? – so the significance should not just be judged by the developer, but also judged by the local authority.

Mark Chapman, Mouchel

While the meeting didn't reach any firm conclusions, I hope it is the first of many future meetings where air quality professionals gather to try and provide answers to such important matters. I have aspirations that over the course of these meetings the IAQM will be able to agree and publish a set of guiding principals to which can be referenced in the application of professional judgement when determining impact significance.

With air quality assessments covering such a wide variety of application it will be difficult to come up with guiding principals that will be appropriate in all situations; however, I am confident that with the vast expertise members of the IAQM hold, a set of principals for range of circumstances can be drawn up.

SCIENCE SHORTS

Exposure marker

As well as being an effective exposure marker for smoking, 1-hydroxpyrene is an effective biomarker for exposure to NO_2 four of five days before urine samples were taken, say Spanish researchers.

Urinary 1-hydroxpyrene, air pollution exposure and associated lifestyle factors in pregnant women, Sabrina Llop et al, *Science of the Total Environment*, Vol. 407 pp97-104.

Cancer risks increase near busy roads

Israeli researchers believe that busy roads may increase the risk of contracting non-Hodgkin Lymphoma, a form of cancer.

The disease is common in the US and incidence rates are growing in Europe, Japan and Israel.

The researchers studied over 1400 patients and found that those living near busy roads were most at risk.

Non Hodgkin Lymphoma linkage with residence near heavy roads – a case study from Haifa Bay, Israel, Shlomit Paz et al, *Health and Place*, Vol. 15 pp636-641.

Asthma rates compared

The Los Angeles Family study has found that incidence of asthma appeared to increase with levels of ozone and PM_{10}.

Outdoor air pollution, family and neighbourhood environment, and asthma in LA FANS children, Michelle Wilhelm et al, *Health and Place,* Vol. 15 pp25-36.

Composting effect

Italian researchers believe that composting facilities are unlikely to pose a bacterial or fungal risk to nearby residents, but may pose a risk to workers.

Assessment of airborne micro organism contamination in an industrial area characterised by an open composting facility and a wastewater treatment plant, Pietro Grisoli et al, *Environmental Research* Vol. 109 (2009) pp135-142.

BIOMASS

Stove emissions studied

Brighton researchers have studied emissions from a wood fired boiler under varying conditions.

Particles, carbon monoxide, nitrogen oxides and PAHs in both gaseous and particulate phases were measured in the stack of a woodchip-fired 50kw boiler used for domestic heating.

Concentrations of PAHs in both gas and particle phases varied from 1.3 to 1631µg/m^3, while carbon monoxide and NO_x concentrations varied between 96 and 6002ppm and 28 to 359ppm respectively. The species of tree used had less impact on pollutants than moisture content, the best way to minimise PAHs is to have low moisture content woodchips and that the boiler should be used with medium or high demand (avoiding smouldering flames).

"Slumber modes when the boiler has no load demand and is effectively a smouldering flame should be avoided." Slumber mode was characterised by inefficient, low temperature combustion with high carbon monoxide, low NO_x and high oxygen."

Researchers added: "To minimise slumber mode, users should avoid wood fired boiler use in warmer weather when there is a low demand on the boiler, and install a boiler with the minimum capacity necessary to maintain a high load and avoid slumber mode.

Sulphur dioxide was below detectable limits. Particle concentrations were between 6 and 4427mg/m^3 with an overall mean of 263mg/m^3, with no significant difference in the mass of particulates emitted by the boiler under slumber or full flame conditions.

Researchers added: "There is much concern for public health due to particulates from residential wood combustion, however emissions are very dependent on the type of device and the technology. For example emissions of particulates from combustion of wood logs in five year old technology boilers were 16 times higher than from six modern boilers.

"The best performing of these modern log boilers used dry fuel and had water storage tanks and gave similar emissions to pellet boilers."

Release of polycyclic aromatic hydrocarbons, carbon monoxide and particulate matter from biomass combustion in a wood fired boiler under varying boiler conditions, Keeley Bignal et al, *Atmospheric Environment* Vol. 42 pp8863-8871.

BIOMASS

Danish study tots up stove impacts

Danish researchers have monitored the impact of domestic wood burning on air quality.

A village with 2,200 inhabitants was studied, about a quarter of the homes used wood burners to heat their homes, the remainder using natural gas. Measurements were made in the village and in an area away from the village to act as a control.

The local contribution to $PM_{2.5}$ was found to be about 1.2µg/m^3, corresponding to about 10%, and reaching 2.6µg/m^3 in the evening period in winter. Diurnal analysis of $PM_{2.5}$, particle numbers and volume indicate traffic as a local source in the day and wood burning in the evening.

Researchers said: "The study provides new information on population exposure to particles and PAHs from wood combustion in residential areas. Even though this additional exposure to $PM_{2.5}$ from wood combustion is relatively small compared to the total burden of exposure, it is important to note that if affects a large number of people."

Characterisation of particles from residential wood combustion and modelling of spatial variation in a low strength emission area, M Glasius et al, *Atmospheric Environment* Vol. 42 pp 8686-8697.

TOXICS

Incinerators: no effect on pregnancy

Italian researchers have been unable to find that incinerators have any impact on pregnancies.

Spontaneous abortions and congenital birth defects in women living or working near a municipal solid waste incinerator in Modena, Northern Italy were recorded over a 3-yr period. This group experienced higher levels of exposure to PCB dioxins and furans compared to the non exposed.

Researchers said: "In women residing in two areas close to the incinerator plant with increasing exposure to dioxins, we did not detect an excess risk of miscarriages or birth defects, not did any indication of dose response relation emerge.

"Among female workers employed in the factories located in the exposed areas, we did not observe a higher risk of spontaneous abortion, however an increase in prevalence of birth defects was noted (a relative risk of 2.26) but this risk estimate was very unstable.

"Overall, the study results provide little evidence of an excess risk of adverse pregnancy outcomes in women exposed to emissions from a modern municipal solid waste incinerator."

Adverse pregnancy outcomes in a population exposed to the emissions of a municipal waste incinerator, Marco Vinceti et al, *Science of the Total Environment*, Vol. 407 (2008) pp116-121.

MONITORING

Exposure in microenvironments

Cardiff researchers have tried to compare personal exposures with that obtained from fixed site monitors.

Indoor measurements were compared with outdoor measurements over an 18 month period at high traffic flow sites and low traffic flow sites. PM_5 and total particle number were measured.

The median outdoor PM_5 concentration in the exposed area was 16.7µg/cm^3, 45% higher than the lower traffic density area. The median total particle number in the exposed area (18,130 particles per cu cm) was almost double that in the lower traffic area.

The median indoor concentration of PM_5 in the exposed area 13.2µg/cm^3 was also 40% either than in the unexposed area, but there as no difference between total particle number indoors between the high and low traffic areas.

Researchers concluded: "The observed differences in respirable particles between areas of high and low traffic flow underline the importance of obtaining exposure measurements in microenvironments."

They added: "The findings indicate that outdoor PM_5 contributes significantly to indoor PM_5 in trafficked areas since the build form and heating type were the same in both areas.

"The 15 minute sampling strategy employed in this study cannot be regard as yielding a representative measure of longer term exposure in different microenvironments, but these data demonstrate that subpopulations exposure to particularly high and low traffic emissions have significantly different exposures."

Researchers continued: "Thus the spatial extent of hot spot impacts from traffic related particles still needs to be considered by researchers and policy makers."

Outdoor and indoor respirable air particulate concentrations in differing urban traffic microenvironments, Susan O'Connell et al, *Journal of Toxicology and Environmental Health*, Part A, Vol. 71 pp1069-1072.

TRAFFIC POLLUTION

Barrier can cut pollution exposure

Dispersion modelling in Ireland has shown that a low boundary wall down the middle of a road could cut pedestrian exposure to pollutants.

3D computational fluid dynamics models were used to examine the effect of varying wind speeds and directions in difference street canyon scenarios. A low boundary wall located along the central reservation creates a significant reduction in pedestrian exposure on the footpath.

The reduction was up to 40% for perpendicular wind directions and 75% for parallel wind directions to the street canyon.

Researchers said: "Using the results of this investigation, pedestrian exposure reduction campaigns could be carried out on a city by city basis where prevailing in directions, street geometries and orientations could be used to determine the best strategy in locating boundary walls to reduce exposure."

A numerical investigation of the impact of low boundary walls on pedestrian exposure to air pollutants in urban street canyons, A Mcnobla et al, *Science of the Total Environment*, Vol. 407 (2009) pp760-769.

VEGETATION

Call for staged ammonia levels

Scottish researchers have called for a staged critical levels for ammonia.

They say that the current critical level for ammonia in Europe is set at 8µg/m^3 annual average. But recent evidence has shown specific effects of ammonia on some plant communities at much lower concentrations.

Researchers have thus suggested new levels, including 1µg/m^3 as a long term average to protect lichens and bryophytes and 3µg/m^3 for herbaceous plants.

Researchers admit that there is insufficient evidence to set a critical limit for forest trees, but believe the value could also be 3µg/m^3.

They explained: "The current annual limit of 8µg/m^3 is of little practical use because it was not defined in terms of sensitive ecosystem, and because it is not as precautionary as empirical nitrogen critical loads for most of the semi natural habitat of Europe. Clear evidence has emerged, especially from field studies of effects of ammonia well below the current limit."

They added: "Based on that evidence, a limit of 1µg/m^3 can be assumed to be protective for biodiversity of most sensitive ecosystems."

Evidence for changing the critical level for ammonia, J Cape et al, *Environmental Pollution*, Vol. 157 (2009), pp1033-1037.

SCIENCE SHORTS

Asthma understanding

Scientists from King's and Imperial College London believe they have discovered a key element in the development of chronic asthma.

Their research published in the journal Proceedings of the National Academy of Sciences explains why the structure and function of asthmatic airways are changed or 'remodelled' and how this contributes to chronic asthma.

Remodelling occurs when the small airways in the lungs of people change gradually with time as their lungs respond to the presence of particles such as dust, pollen and mould in the air they breathe. These changes can also be compounded by viruses and bacteria.

Airway remodelling is apparent even in the lungs of young children with asthma, and can make the condition almost impossible to control. An important aspect of airway remodelling is changes to the muscle cells which line our airways. In people with asthma, these cells tend to multiply and become larger, increasing their ability to squeeze the airways and cause breathing difficulties. There is no known way of reversing airway remodelling once it has occurred.

Heat affects hearts

Taiwan researchers have linked heat and pollution to heart failures.

Hospital data for a ten year period was studied and heart-related hospital admissions were related to PM_{10}, NO_2, carbon monoxide and ozone on hot days.

On cool days, and association was only seen for carbon monoxide.

Air pollution and hospital admissions for congestive heart failure in a subtropical city: Taipei, Taiwan, Chun-Yuh Yang et al, *Journal of Toxicology and Environmental Health Part A*, Vol. 71, pp1085-1090.

HOT AIR

We hear that increasing numbers of businesses are turning to psychics.

Russell Grant Astrology boasts a "carefully selected team of psychics and mediums" who can be called on for business advice. The firm says: "1 in 3 calls used to be regarding a love-related matter – until it was evident over the past few months that more and more business owners have been calling up to get advice during this tough climate; for instance by financial directors to plot the business moving forward.

As southern Britain swelters in a heatwave, weather forecasters are seriously struggling to get the forecast right – they can confidently say it will be hot, but not whether, or where, it will rain. And as air quality forecasts rely on weather forecasts, we suspect the air quality forecasters are struggling to decide whether to issue smog alerts.

We will await with interest the end-of-year review of the air quality forecasting service to see how they performed. We think it would be in the public interest to know whether using psychics and mediums would do any better.

Iapsc's recent conference in Sheffield proved a real humdinger, with delegates twice asked to think the unthinkable.

Defra was the first, asking the audience to suspend disbelief with its continued (but much less self assured) assertion that NO_2 levels were going down. Alan Walder of Redbridge wasn't having any of that: three times he challenged the calm and friendly Defra air quality man Robert Vaughan. Mark Daly intervened before things got really really nasty.

Then Rebecca Pointon of Cheshire East (a new unitary) asked the audience to believe that a few tins of magic paint could miraculously cut NO_2 concentrations. We've reported before on her trials, and other London boroughs' attempts to measure the claimed benefits of titanium dioxide NO_x-eating coatings.

No criticism of Pointon is intended. She's as down to earth as they come and seemed positively embarrassed to have to report that the magic paint could have any real effect on the streets in Congleton. She described that using the paint was effectively a last resort as there was nothing else that could be done about heavy traffic on the A34 just a few feet from terraced housing.

But against all odds, monitoring seems to suggest it has cut concentrations by 28%. Before and after tube concentrations showed a drop from 59µg/m^3 to 41µg/m^3 while concentrations at a control site went up by 10µg/m^3 in the same period. The tail-off could also be seen at increasing distances from the paint-treated area.

This conclusion was met with visible scepticism by the audience. Pointon appeared to be in the same boat – it's almost as though she expected the paint to fail – and is now reluctantly a convert.

Can it be too good to be true? Monitoring experts muttered that maybe the paint was directly affecting the chemistry of NO_2 tubes. Like scientifically inexplicable religion, UFOs and ghosts, we suspect we haven't heard the last of NO_x-eating paint.

The Environmental Transport Association has published its green car awards which highlight the best and worst new cars.

What is interesting is that within vehicle classes (eg family saloon, supermini), the difference between the best and the worst in terms of emissions is usually way more than a factor of two. Surely the message here is, that for now at least, you *can* make personal decisions to help the environment without changing your lifestyle.

So why isn't more being done to push people in this direction?

AIR QUALITY EVENTS 2009

16th July

Air quality forecasting seminar

to be held at the Council House, Birmingham, Contact sue.powditch@aeat.co.uk

15th-17th September

Measuring Air Pollutants by Diffusive Sampling

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

17th September

Clearer Future Conference

South Yorks/Low Emission Strategies Development Partnership conference to be held in Sheffield www.care4air.org

23rd September

Biomass and Air Quality: Managing the Impacts

Epuk event to be held at the Royal Society in London Carry Keay 01273 878776 www.environmental-protection.org.uk

30th September

South West Division Air Quality Management Event

Epuk SW division event to be held in Bristol email jo.barnes@uwe.ac.uk

12th November

Air Quality Update

EPUK conference to be held in Birmingham, Carry Keay 01273 878776 www.environmental-protection.org.uk

9-10th December

Monitoring ambient air 2009 air quality – the major

Challenges, AAMG conference to be held in London website http://rsc-aamg.org/Pages/Meetings/MAA2009.html

2010

12-16th September

15th World Clean Air and Environmental Protection Congress

to be held in Vancouver, Canada http://iuappa.com/index.htm.

9th December

Investigation of Air Pollution Standing Conference

Iapsc's second conference of the year to be held at the Council House, Birmingham. Website www.iapsc. org.uk.

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