

## POLICY

# Cleaner vehicles threaten widespread NO<sub>2</sub> objective failure

An apparently minor change to the amount of nitrogen dioxide emitted from vehicles may jeopardise achievements of air quality objectives across the UK.

The assumption by many local authorities with borderline NO<sub>2</sub> concentrations is that NO<sub>2</sub> will decrease as the vehicle fleet gets cleaner, so improving concentrations. This may not be the case, according to Leeds researcher David Carslaw.

Carslaw was talking to the NSCA spring workshop held in Didcot last month – he is also on the Air Quality Expert Group which considers the issue so important that it is squeezing in a ‘quickie’ report on primary NO<sub>2</sub> emissions.

The emerging problem is that new vehicles may emit less NO<sub>x</sub> than their predecessors – but more of that NO<sub>x</sub> is emitted as NO<sub>2</sub>, increasing total NO<sub>2</sub>

emissions at the roadside. Local authorities are judged on concentrations of NO<sub>2</sub> rather than NO<sub>x</sub>.

The problem has been known about for some time, especially

### Impact of primary NO<sub>2</sub>

The impact of increased NO<sub>2</sub> emissions on concentrations

Primary NO <sub>2</sub> (%)	NO <sub>2</sub> (µg/m <sup>3</sup> )
5	37.9
10	42.9
15	47.9
20	52.9

in London where widespread use of clean up equipment such as particle traps has reduced PM<sub>10</sub> emissions dramatically but increased direct primary NO<sub>2</sub> emissions.

The traditional assumption has been that 5% of vehicle NO<sub>x</sub> is

NO<sub>2</sub> (direct NO<sub>x</sub>) with the rest of the NO<sub>x</sub> gradually converting to NO<sub>2</sub> as it is exposed to oxygen and ozone.

But it is now suspected that trap-equipped buses and trucks can emit 20% or more direct NO<sub>2</sub>, worsening roadside concentrations. The phenomena may explain why roadside concentrations in London and many other urban areas are going up despite reductions in NO<sub>x</sub> emissions.

AQEG’s snap report on primary NO<sub>2</sub> emissions is already nearly complete and should be released in June. Carslaw told the NSCA workshop that the 5% assumption used in AQEG’s and others current assumptions is ‘somewhat shaky’. “1997 assumptions for 5% direct NO<sub>2</sub> were quite reasonable. But now these have increased by a factor

● continued on page 2

## ODPM becomes DCLG

In Prime Minister Tony Blair’s recent shake up of the Cabinet, David Miliband has been appointed Secretary of State for Environment, Food and Rural Affairs replacing Margaret Beckett.

David Miliband entered the Cabinet as minister of communities and local government in May 2005, supporting the Deputy Prime Minister on housing, planning, regeneration and local government. He was previously Cabinet Office minister, and schools minister, and is MP for South Shields. Junior Defra ministers reporting to Miliband remain unchanged (Ben Bradshaw has the air quality brief).

Meanwhile the ODPM ‘superministry’ is to be shaken up with the brief taken off Deputy Prime Minister John Prescott.

The new Department for Communities and Local Government (DCLG) will come under Ruth Kelly’s leadership and incorporates a new remit to promote community cohesion and equality, as well as responsibility for housing, urban regeneration, planning and local government.

DCLG will “unite the communities and civic renewal functions” previously undertaken by the Home Office, with responsibility for regeneration, neighbourhood renewal and local government (previously held by the ODPM).

## Buncefield latest

As AQB went to press, a report into the Buncefield plume was released suggesting there were no lasting public health impacts.

This is the preliminary conclusion of a Nctcen study and health surveillance study carried out by the Health Protection Agency (HPA), and the local Primary Care Trusts.

● More next month, and see news, page 6

## INFORMATION

# New (but familiar!) source for air quality news

Welcome to the first edition of *Air Quality Bulletin*. It may look a little different to what you’re used to getting – but the editorial content should be reassuringly familiar.

*Air Quality Bulletin* is edited by Jack Pease, formerly of *Air Quality Management*. “With eight years of experience reporting air quality issues, I will provide the best, concise and most incisive coverage possible of the sector. But the real benefits of the new venture will be improved customer service and a far closer relationship with the air quality profession.”

All change is difficult, and Pease recognises that the profession will demand proof of the need to sign up to a new newsletter: “There is so much going on in air quality at the moment that we’ve even had to

postpone our planned research summary section towards the back of the magazine to make room for more news. Where else will readers get the chance to read in-depth analysis of issues



Launch customer: David Harvey of ADM (right) and editor Jack Pease

such as the new strategy, the NSCA spring workshop, staff changes and other policy breakthroughs? Everything is geared towards helping readers do their job better (but by popular demand the back page is retained!).

*Air Quality Bulletin*’s launch customer is David Harvey of consultant ADM. He said: “I don’t have time to wade through loads of magazines and websites to keep myself informed. I want a job-useful and concise newsletter that allows me to keep on top of air quality news – I trust Jack Pease to do that with *Air Quality Bulletin* and am delighted to be the launch customer. I wish him all the best.”

AQB will appear monthly alongside *Noise Bulletin*, which has already been published.

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## ● Primary NO<sub>2</sub>: continued from page 1

of three in a very clear trend. This means that roadside sites in London are showing increases – and there is evidence coming in from France and Germany of a similar increase.”

Carslaw showed graphs of NO<sub>2</sub>/NO<sub>x</sub> ratios at Marylebone Road where “something happened in early 2003”. Other sites in the UK have shown similar abrupt changes. The changes in London coincided with the introduction of the congestion charge and increases in bus numbers, in Oxford a similar change was seen when particle filters were fitted to buses.

Carslaw said the latest clean diesels were showing 30-35% direct emissions of NO<sub>2</sub> – a growing issue with the increasing popularity of diesel vehicles. “The implications of this are that many assessments of future (2010) NO<sub>2</sub> concentrations will underestimate actual concentrations.” He cited Heathrow Airport as a case in point where NO<sub>2</sub> may not reduce – and that had primary NO<sub>2</sub> emissions stayed the same, then Marylebone road would have met the hourly NO<sub>2</sub> limit value.

Carslaw went on: “There are wider issues. Increased direct emissions of NO<sub>2</sub> will lead to increased ozone. Modelled across London, this will lead to a 2µg/m<sup>3</sup> increase which again is pretty significant and might be even more important in some respects than the rise in NO<sub>2</sub>.”

“Emissions of nitrous acid (HONO) are also potentially important as it leads to more NO<sub>2</sub>, ozone and particles (through nitrate formation). It also is picked up as NO<sub>2</sub> in chemiluminescent ambient monitors.” He concluded that there was an urgent need for a primary NO<sub>2</sub> inventory, and warned local authorities to be careful on how they treat new bus fleets in their area when estimating emissions.

Conference chairman Steve Moorcroft warned authorities: “At some sites where there are concentrations of, say, 42µg/m<sup>3</sup>, future-years adjustment factors suggesting this might come down in the future might now be an optimistic view.”

## NEWS FROM THE NSCA SPRING WORKSHOP HELD IN DIDCOT LAST MONTH

# Defra rounds up local air quality progress: laggards lambasted

A record number of local authorities now have air quality management areas, Defra air quality head Davide Minotti has revealed.

Minotti, who is leaving his post (see news, right) told the NSCA spring workshop held in Didcot last month that some 191 authorities have now declared air quality management areas.

Two thirds of these are for nitrogen dioxide, a quarter PM<sub>10</sub>, 4% for sulphur dioxide and just one authority has declared for benzene. 109 draft action plans have been received, and 68 final plans submitted.

Minotti once again criticised the “laggards” – late-running authorities who have missed deadlines by as much as two years. 11 authorities still haven’t completed their 2004 detailed assessment, while six have yet to finish their 2005 detailed assessment.

16 authorities have not completed their 2005 progress report, 14 councils have not tabled a draft action plan, and 28 have yet to finalise their plan.

A further deadline has just passed – updating and screening assessments were due in by the end of April with Minotti saying he had received just 15. He

pointed out that the next deadline – April 2007 – was for another detailed assessment (or progress report as appropriate).

He reflected on the process so far: “The emerging questions at this stage of the strategy is whether we have found most of the hotspots that exist? How can we explain to residents and political masters why it is important to improve air quality? And how we are doing on actions – and whether providing any more accuracy on monitoring and modelling will change the course of action required?”

Local authorities are currently waiting for results form the local transport planning (LTP) round. Interim LTP second round bids were submitted in July 2005 and DfT has assessed these bids, with particular focus on air quality. Comments have been included in revised bids that were resubmitted in March, these will once again be assessed, including on air quality, with final assessments due later this year.

LTP reporting criteria are still not finalised. A key part of the LTP is reporting on progress on the air quality policies that will receive funding. Guidance on how that air quality progress can be reported is being developed –

Minotti said that local authorities should still work on the assumption that annual reporting will remain a requirement. In the mean time air quality EHOs should keep reminding transport planners if air quality policies have not happened.”

Minotti remains frustrated at continued failure to integrate air quality into other disciplines, whether within the same authority, or with transport planners in the county in a two tier area.

He also criticised authorities that were defeatist. He urged authorities to bold and innovative, citing the London congestion charge and low emission zone as an example of authorities being bold. But one authority just outside the zone complained to him that there might be adverse side effects.

“I asked if it had considered joining in the LEZ, having the same administration, signing and rules. The authority replied ‘we couldn’t possible do that’. I asked whether it had been proposed, and it hadn’t even been discussed. I cannot accept this sort of answer. Gather the evidence, do the maths and then come to a conclusion, don’t dismiss things out of hand.”

## FINANCE

### Real money – but less of it

A grant scheme has replaced borrowing approvals for air quality – but less cash will be available.

Central government support to local authorities previously came under supplementary credit approvals. This system is essentially ‘permission to borrow’ and could effectively be considered as cash for local authorities that borrow money to operate. For debt free authorities, however, the system was not helpful.

These supplementary credit approvals have now been replaced by a dedicated air quality grant scheme. Minotti said: “For the first time, the grant will come as real cash.”

But the budget is still the same

at £2.3m per annum. In previous years Defra has been able to double the amount by making savings elsewhere in the budget, this will no longer be possible.

Coupled with this is a doubling of applications from local authorities (up from £4m in previous years to £9m) reflecting the increased popularity of cash grants rather than borrowing approvals. “With £9m bids against £2.3m of funding, clearly applying for £500,000 funding for monitoring is not the best bid,” said Minotti, adding that he would favour bids that focussed more on action planning and on actions that leverage other funding or further actions – perhaps from local authority transport budgets.

## AVIATION

### Heathrow dodge?

At the NSCA spring conference, Hillingdon’s Rob Gibson asked Defra air quality head Davide Minotti if it was the UK government’s intention to apply for a derogation for the Heathrow area which is not expected to meet EU air quality objective requirements.

Minotti replied: “Clearly the evidence is strong that the objectives can’t be met – I can’t give an answer on whether the Government will apply for a derogation.”

The issue is of importance to the further development of Heathrow. The Government has said that no further development can take place at Heathrow unless EU objectives are met.

● See also news, page 4

NEWS FROM THE NSCA SPRING WORKSHOP HELD IN DIDCOT LAST MONTH

# Minotti heads off after three years in air quality post

Air quality head Davide Minotti is leaving his post. A successor has yet to be announced.

Minotti heads up air quality within Defra's air and environmental quality (AEQ) division, he is usually present at air quality conferences explaining to local authorities and consultants what they must do to improve air. He is moving to the Prime Minister's Delivery Unit (formally a part of Cabinet Office) working on 'Capability reviews' for central government departments.

Civil servants traditionally move from post to post every few years as part of their career development process and both Minotti, and his predecessor

Rupert Furness have moved to different policy areas after their stint in air quality.

Minotti broke the news to NSCA spring workshop delegates: "It is fitting that I should announce my departure at the very same venue that I debuted three years ago. I've had a great time and hope I achieved something."

He then went on to list his achievements – which include setting up a public service agreement with Defra – and then seeing off attempts to abolish it. He has overseen various updates of technical guidance and strategies, and the update of the PPS23 air quality and planning strategy.

● **Editor's comment:** Minotti will be missed, as was his predecessor Rupert Furness. Both incumbents were bright and cheerful in their post and brought policy confidence to their air quality role.

Both men were 'rising' civil servants en route to better things, in the current civil service shake up, Defra's recruitment policies are necessarily constrained and the air quality profession will have to hope that Minotti's replacement will view the position with the importance it deserves.

AEQ chief Martin Williams is currently interviewing potential successors.

● NSCA's Joseph quits: see p5

IN BRIEF

## First pollution alert

Hot and sunny conditions and easterly winds produced the first widespread ozone incident of the year earlier this month. And as AQB went to press, smoke from Russia was tripping PM monitors in the north of the UK.

Compared to some years this is relatively late in the year for the first ozone incident according to ERG. In both 2002 and 2003 a widespread ozone incident occurred during March and in 2004 it was in mid April.

Moderate ozone was recorded right across the London Air Quality Monitoring Network (LAQN) with only five roadside sites not reaching moderate.

Levels peaked around 80ppb in Bromley (Biggin Hill), Kingston (Chessington) and Hounslow (Cranford). Many other sites peaked in the 70s.

Other ERG networks in Hertfordshire & Bedfordshire, Kent & Medway (KMAQMN), and Sussex (SAQN) also recorded widespread moderate ozone. In all, of the 47 operational ozone monitoring sites across the region, only 10 sites, mainly roadside or heavily influenced by traffic, did not break the moderate threshold.

● [www.londonair.org.uk](http://www.londonair.org.uk)

## Final indicator

The Government has finalised its 2005 air quality indicator.

Annual average urban background PM<sub>10</sub> levels remained unchanged at 22µg/m<sup>3</sup> from 2004 to 2005. Rural ozone levels (measured as the daily maximum 8-hour running mean) averaged 70µg/m<sup>3</sup> in 2005 compared to 73µg/m<sup>3</sup> in 2004 and 68µg/m<sup>3</sup> in 1993. There is no clear long term trend.

Urban background ozone levels were 57µg/m<sup>3</sup> in 2005, the same as in 2004 and have generally increased from 42µg/m<sup>3</sup> since 1993.

In urban areas in 2005, air pollution was recorded as moderate or higher on 22 days on average per site, compared with 23 days in 2004.

● Indicator: [www.sustainable-development.gov.uk](http://www.sustainable-development.gov.uk)

LOCAL GOVERNANCE

# Tidmarsh urges 'cream of the crop' to bid for Beacon status to unlock AQ funding

Local authorities have been given more detail on how they can apply for Beacon status based on their air quality record.

The aim of the Beacon scheme is to recognise excellence, spread best practice, raise standards and help deliver high quality public services. Beacon authorities will share £3m if they show excellence in a number of allocated subjects – the forthcoming Beacon round includes air quality as a designated theme for the first time.

Speaking to the NSCA spring workshop, Defra's Carole Tidmarsh said: "We are looking for the cream of the crop – those who see air quality not just as a duty but also a vocation. Beacons will demonstrate full commitment and enthusiasm for going beyond statutory duties in promoting and implementing air quality policy and integrating these efforts with action on other environmental concerns, especially climate change."

Other criteria include:

● Beacons will deal with air quality policy in a corporate way and have a framework in place

for driving decision making and disseminating information on air quality;

- They will be proactive and lead by example, also prompting others to act positively;
- Beacons will provide evidence of effectively raising the profile of air quality and working closely with the local community, and also involvement with schools and universities;
- They will also provide evidence of increased satisfaction from the local community on the local authority's role;
- Beacons will have developed an excellent understanding of air quality and also understanding of mitigation measures and options;
- They will demonstrate significant actions that they and others have taken to improve air quality and show evidence of success in addressing air quality and greenhouse gas reduction;
- Beacons will have developed innovative ways of raising the profile of air quality across local government departments and tiers of government;
- They will show positive

engagement with all external stakeholders and how they work closely with other authorities;

- They will show how the needs of all members of the local community are met;
- They will provide evidence that all air quality duties are being delivered and show how they are going beyond statutory duties in tackling air pollution and promoting air quality;
- They will demonstrate the positive impacts of air quality activities on local citizens and on the environment.

The deadline of applications is 23 June, applications will be assessed in July and August with a shortlist prepared in October, winners will be announced next March.

Winners will be expected to host at least one open day (and can retain income from charging other local authorities for sharing their excellence).

Tidmarsh concluded: "So if you have got what it takes, and are prepared to flaunt it, don't hesitate – apply for beacon status today."

● More information [www.idea.gov.uk/beacons](http://www.idea.gov.uk/beacons)

## IN BRIEF

### AQ notes help out

Local authority regulators are being urged to publicise environmental prosecutions more widely in this year's seventh air quality note.

Note AQ7 reveals that in 2004/5, 83 enforcement notices and three prohibition notices were issued, there were 13 prosecutions and 11 formal cautions. The total fines from all successful prosecutions were £248,295 compared with £57,500 in 2003/4.

The note says: "However LAPPC and LA-IPPC enforcement action is very rarely reported in the environmental press which is likely to be read by the key associations, installation operators, and small businesses. Knowledge at national level of the extent and details of enforcement action will serve as an important reminder to all operators of the potential pitfalls of non-compliance with the regulatory requirements.

Local authorities are urged to provide a short description to journals (such as AQB) of all completed prosecutions, enforcement notices which address major compliance failures, and prohibition notices.

### Buncefield advice

AQ8 warns local authorities of their responsibilities for fuel depots in the wake of the huge Buncefield explosion in December.

Some 40 local authorities regulate the storage of petrol in stationary storage tanks at a terminal under LAPC.

Part B regulation controls releases to air and does not regulate accident prevention but does cover inspection of the facilities, adequacy checks of management controls and leak detection.

### Crematoria rethink

Baseline calculations of mercury emissions from criteria have been changed according to air quality advice note AQ 09.

● Air quality notes can be viewed on [www.defra.gov.uk/environment/airquality/lapc/aqnotes](http://www.defra.gov.uk/environment/airquality/lapc/aqnotes)

## AVIATION

# Heathrow fight reaches crescendo

Technical deliberation on air quality issues at Heathrow is concluding – a report is due within a month.

The Project for the Sustainable Development of Heathrow was set up following the Aviation White Paper announcement that further development at Heathrow would not be allowed to go ahead if mandatory EU air quality objectives would be breached. Project Heathrow consists of three technical panels looking at modelling, monitoring and emissions, and an overarching scrutiny panel to check that the final report is fair.

That report is due soon and is eagerly anticipated by aviation interests because of the detailed analysis of aviation emissions at ground level. But the panel's conclusions will not include a 'yes' or 'no' for more development at Heathrow – that will be done on the nod by ministers with no further consultation.

DfT's Roger Gardner acts as secretariat to the project and spoke at the recent NSCA Spring Workshop: "Some might say that the idea of sustainable

development at Heathrow is an Oxymoron – but the panel has been convened to focus on technical pre-policy to acquire the very best accepted means of assessing the development options."

Key topics include model verification, initial dispersion of the aircraft plume, a better understanding of background and model intercomparison. On the latter, the technical group has opted for ADMS Airport as the preferred model – but used others to benchmark the modelling.

David Carlaw of Leeds University told the workshop of more technical work going on to support the panels. He said that the work had led to 'compelling evidence' that aircraft emissions are detectable beyond the site boundary – as much as 27% of NO<sub>x</sub> is down to planes.

The nature of NO<sub>x</sub> from the airport and from roads has proved to be different – Carlaw says that NO<sub>x</sub> from roads tends to die down very quickly away from the road, and reduces in high wind conditions. But NO<sub>x</sub> from the airport does not die

down quickly and does not reduce in concentration even at high windspeeds.

He concluded: "It is true that as road vehicles are cleaned up, the airplane derived NO<sub>x</sub> will assume greater importance, but this isn't necessarily true of NO<sub>2</sub>, especially with the issue of greater direct emissions of NO<sub>2</sub> from motor vehicles."

Rob Gibson of Hounslow welcomed having the opportunity to contribute to Project Heathrow adding: "If only we had the same level of transparency with other work streams on surface access, mixed mode and noise. But on air quality we remain concerned about model inputs, assumptions and outputs."

He said that he was considering adopting a policy of accepting airport expansion only when monitored levels of NO<sub>2</sub> met the objective, rather than relying on modelling results which could be flawed: "We have been modelling air quality for year and for example, PM<sub>10</sub> has never been shown to be a problem. Lo and beyond we get to 2005 and we have a (monitored) PM<sub>10</sub> problem."

## BA: Air quality conditions met

British Airways claims NO<sub>2</sub> limits that might prevent airport expansion have already been met.

BA, alongside BAA, has a stake in improving air quality to allow expansion. In a staff newsletter, BA's banner headline reads: 'Heathrow air passes EU test'. BA air quality specialist Kevin Morris said: "The results of this monitoring dispel the myth that Heathrow is the most polluted place in the UK. It also confirms our earlier analysis that suggested air quality surrounding Heathrow did not breach the EU directive limits."

The claim is based on diffusion tube data collected between November 2004 and November 2005. Morris says: "The diffusion tube data has been bias corrected using a triplicate set mounted on the intake mast of the LHR2 continuous monitor, for which the data has been fully ratified – hence the delay in the publication of the report. Reassuringly, the Harlington

chemiluminescent monitor went live during our measurement campaign, and NO<sub>2</sub> levels compare well with one of our set of tubes close-by, when bias corrected using the LHR2 monitor."

Rob Gibson Hounslow says: "The timing of BA's comments is unhelpful, given the more considered Project Heathrow findings are imminent. BA's results do not consider pressures from Terminal five, a third runway, increases in primary NO<sub>2</sub> emissions, nor the fact that Defra no longer relies on tubes for such predictions."

He went on to say: "BA also bias-corrects using a site by the runway that is completely inappropriate, if you use Hillingdon data to do this correction, all the sites fail."

● *A continued investigation of air pollution in the vicinity of Heathrow Airport (2 November 2004 to 1 November 2005)* can be viewed on [www.heathrowairwatch.org.uk](http://www.heathrowairwatch.org.uk)

## Heathrow air is "illegal"

A report from airport protesters claims the Government may be acting illegally over air pollution limits at Heathrow.

In its *Emissions impossible* report released in March, the Aviation Environment Federation argues that the Government could already be in breach of EU regulations at Heathrow based on 2004 NO<sub>2</sub> objectives rather than the 2010 objectives more usually discussed. It is lobbying Brussels on the issue.

BAA is focussed on the 2010 NO<sub>2</sub> objective as the Government pledged that further expansion at the airport would not go ahead unless this objective was met. Huge amounts of monitoring and modelling are underway to establish whether that limit will be met, and an expert report on the methodology behind that report is due shortly (see above)

● *Emissions impossible* AEF [www.aef.org.uk](http://www.aef.org.uk)

ROADS

# Highways Agency pledges to halt upgrades if air is worsened

The Highways Agency appears to be taking a firmer line on air quality issues. It is pledging not to carry out works if those works worsen air quality in air quality management areas.

In the latest annual business plan, the pledge replaces a series of looser targets based on noting improvements near agency roads where they passed through air quality management areas, aiming that two areas showed improvements.

The latest 2006-07 business plan says: "We are giving priority attention to those areas

which are forecast to have a compliance issue with the EU directive. We forecast that of 78 declared air quality management areas on our network, 28 may face a compliance problem for the EU NO<sub>2</sub> 2010 objective. Where these coincide with planned improvements, the agency will not progress a 'targeted programme of improvement' which would produce a new compliance problem or make an existing forecast compliance problem worse.

"To address these forecast

compliance issues we are evaluating the effectiveness of possible traffic management approaches and other possible mitigation measures with a view to deploying these as appropriate."

It continued: "The published draft of the Commission air quality directive suggests changes that could have a significant impact on the extent of the compliance issue on the Agency network."

● The 2006/2007 business plan can be viewed on [www.highways.gov.uk/news/index.htm](http://www.highways.gov.uk/news/index.htm)

IN BRIEF

## New WHO AQ limits

The World Health Organisation has updated its advice on air quality objectives. Experts are recommending objectives that are tighter than those being proposed in the UK and European air quality strategies.

WHO says: "Based on the review of the newly accumulated evidence on health aspects of air pollution, the working group agreed on the updated guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide. To facilitate implementation of the guidelines in all WHO Regions, especially in more polluted areas, the group recommended interim targets which, if achieved, would result in significant reductions in pollutant-related health risks and would indicate a progress towards the guideline values.

- **PM<sub>2.5</sub>**: annual mean: 10µg/m<sup>3</sup>, 24hr 25µg/m<sup>3</sup>;
- **PM<sub>10</sub>**: annual mean 20µg/m<sup>3</sup>, 24hr 50µg/m<sup>3</sup>;
- **Ozone** 8hr: 100µg/m<sup>3</sup>;
- **NO<sub>2</sub>**: annual mean 40µg/m<sup>3</sup>, 1hr 200µg/m<sup>3</sup>;
- **SO<sub>2</sub>**: 24hr 20µg/m<sup>3</sup>, 10 minute 500µg/m<sup>3</sup>.
- [www.euro.who.int/air](http://www.euro.who.int/air)

## Salford fines

A Salford cement company has been made to pay almost £10,000 after a catalogue of air pollution incidents.

Salford City Council took action against CPI Mortars of Irlam who pleaded guilty to breaches of conditions in its LA-PPC permit. The company was ordered to pay £9,700 in fines and costs at Salford Magistrates Court.

The court heard the details of the case involved a spillage during the filling of a 35 tonne silo with hydrated lime at the Irlam site. As a result an emission of hydrated lime went beyond the site boundary affecting motor cars, property and employees at adjoining business premises. Locals complained of finding white dust on their cars. White dust was also seen on vegetation beyond the boundary.

BUS EMISSIONS

# Merseytravel charges extra for dirty buses

Public transport executive Merseytravel is pledging to use differential charging at its bus stations in a bid to encourage bus operators to use cleaner buses.

Merseytravel says differential departure charges will be introduced from 2007 when the existing agreement with bus operators expires.

Merseytravel's Karen Booth told *Air Quality Bulletin*: "We have flagged it up to the operators so they know it is coming. We are hoping to encourage Euro2 and above with

financial incentives. The exact formula needs to be worked out based on the fleet profile and our aspirations for improving the fleet. It is also important that Merseytravel are not seen to be making money out of this so the charges aim to be revenue neutral."

"The departure charge is currently approximately 30p per bus. Thus the new charges would be something like:

- Euro2 and better: departure charge minus 10%;
- Euro 1 and below: departure

charge plus 10%.

"The intention is to gradually tighten the departure charges, so that after 2009 higher incentives are offered to Euro 3 and better buses."

She added that the Regulatory Reform (Public Service) Vehicles Order 2005 (currently being finalised in Parliament) will allow Merseytravel to pursue a policy of purchasing a fleet of cleaner vehicles which could then be leased back to operators operating supported services.

● Karen Booth, 0151 330 1184

INFORMATION

## Barnsley air on TV

Barnsley residents can find out about air quality on their TV.

A pioneering new service, developed by Barnsley's EHO's, allows digital television viewers to get accurate information about local air pollution. The move has been welcomed by South Yorkshire air quality campaign, Care4Air.

The service, the first of its kind by any local authority in the UK, is available through the e@SY CONNECTS Government channel on Sky, Telewest or ntl digital television. People can view up-to-date air quality information just like Teletext.

PEOPLE

# NSCA chief Joseph to leave

National Society for Clean Air secretary general Martin Joseph is to leave the National Society for Clean Air after just months in the post. Joseph intends to work for acoustic consultants. Previously he was head of noise at Defra.

NSCA had yet to replace deputy chief Tim Brown who left last year, for now it is not directly replacing Joseph and is recruiting for a person to take on aspects of both Brown's and Joseph's jobs for a salary of £32-35,000.

● Sally May at NSCA: 01273 878776



Joseph departure prompts search

## IN BRIEF

### Buncefield 'wisp'

Buncefield will be the subject of the next air quality forecasting meeting.

In December the Buncefield fuel depot caught fire, the resulting fire raged for days and tripped air quality monitors as far away as France. The Health Protection Agency claimed at the time that only a few 'wisps' of smoke reached the ground.

Organisers say: "The theme of the seminar this year will be the response to the Buncefield incident and analysis of its impacts on air quality. These topics are covered at length in a comprehensive report produced by Netcen, Met Office and HPA on behalf of Defra and the Devolved Administrations; this was released and widely publicised in May (more details next month). However, we expect the seminar will go further and also feature more recent data, estimates and insights."

- See events, back page

### Code to cut odour

A voluntary code of practice on smells from sewage treatment works aims to set out good practice for controlling bad smells and how best to respond to complaints of odour.

The code follows numerous court battles with legal arguments concerning whether it is possible to serve nuisance notices on sewage works. The note tells operators and regulators how to:

- Understand odour by, for example, assessing its concentration, intensity, character, and tone;
- Assess how much of a nuisance it is to the surrounding area by, for example, taking account of frequency, intensity, duration, offensiveness, local environment, and sufferer sensitivity;
- Good management of complaints;
- Abate or limit odour through good housekeeping such as maintenance of plant and equipment.
- [www.defra.gov.uk/environment/localenv/odour/index.htm](http://www.defra.gov.uk/environment/localenv/odour/index.htm)

## VEHICLE EMISSIONS

# Traps best measure for clean up

The Environmental Industries Commission (EIC) is throwing its weight behind diesel particulate filters as the best means of cleaning up pollution.

The EIC, in its response to the Transport for London consultation on the London low emission zone, welcomes the move and agrees that the GLA area (the London boroughs) is the most suitable geographical area for the initiative.

But rather than relying on vehicle age or euro standards as is proposed by TfL, EIC says the criteria should instead be fitting of a particle trap: "Using diesel particle filter retrofit for older vehicles is much more effective way of reducing emissions and

attaining the required Phase 1 and Phase 2 emissions standards than the alternative approach of an age based scheme where older vehicles are excluded from the low emission zone.

"There are many retrofitted systems available which will not only reduce PM<sub>10</sub> particulate from an older vehicle to the Euro III particulate level, but will also allow it to meet the Euro IV level. This should act as reassurance to operators that they can be retrofit a technology for Phase 1 (2008) which will also enable them to meet the requirements of Phase 2 (2010) for particulate."

It adds that there is "considerable" evidence from

chassis dynamometer testing of heavy duty vehicles to show that that on 'real-world' drive cycles a Euro II vehicle fitted with a filter will emit less PM<sub>10</sub> than its equivalent Euro III vehicle. Therefore, any low emission scheme should positively encourage the retrofit of diesel particulate filters in order to maximise PM<sub>10</sub> reductions.

EIC continued: "The emissions of ultrafines from a Euro IV vehicle fitted with SCR (Selective Catalytic Reduction) are often more in terms of mass, and in some cases 10 or 15 times more in number, than those from the Euro III equivalent with a full-filtration particulate filter."

- [www.eic-uk.co.uk](http://www.eic-uk.co.uk)

## CONSULTANCY

# Measurement sale ends Casella uncertainty

Months of speculation have ended with the announcement of the sale of Casella Measurement by US firm Ideal Industries.

The sale underscores the huge contrast in the fortunes of Casella in five years from acquisitive, expanding consulting conglomerate to fast-shrinking business openly trying to sell its constituent parts. Casella Consulting (including Stanger) was sold to Bureau Veritas last year, the overarching Casella Group is now little more than an administrative entity.

Ideal Industries Inc. is a US corporation employing over

1000 people worldwide. Casella Measurement is an unusual fit for Ideal, which is one of the USA's largest manufacturers of wire connectors, electrical tools and supplies, along with electrical and telecoms test equipment.

Ideal said this was the fourth acquisition in the test and measurement area in the last five years and their third in Europe during the same period.

Paul Rubens, managing director for Casella Measurement, added: "This is good news for our customers, our distributors and our staff. We

will be able to accelerate our plans for growth in this important environmental sector."

Casella Measurement, based in Bedford, employs 130 staff and comprises Casella CEL, Casella ETi, Monitor Europe, Darwin Hire, Casella USA and Casella Espana.

Ideal says there will be no restructuring arising from the acquisition and all businesses will continue to trade as normal and are unaffected by the change in ownership.

- [www.casellameasurement.com](http://www.casellameasurement.com) and [www.IDEALindustries.com](http://www.IDEALindustries.com)

## MEASUREMENT

# Enviro goes remote for Leeds testing

Monitoring firm Enviro Technology (ET) has become the UK distributor for vehicle emissions monitoring specialist Environmental Systems Products (ESP).

Having sold an Accuscan 4600 remote sensing vehicle emissions monitoring system to the Institute of Transport Studies at the University of Leeds, ET is currently organising a series of roadshows to showcase remote sensing technology.

The Accuscan range and the MCERTs approved OPSIS DOAS system both use

instantaneous non-contact optical measurement techniques to identify and quantify gaseous emissions. The Accuscan 4600 system measures NO<sub>x</sub> CO CO<sub>2</sub> HC and the "smoke factor" which has been specifically developed for assessing particulate emissions from diesel vehicles. As measurements take place with a resolution of less than one second, the Accuscan system will measure the emissions of each vehicle passing through the light path.

The system also records speed and acceleration of the vehicle.

All the data is referenced to an image of the registration plate captured by a high speed camera. This enables the identification of polluting vehicles.

ET's Duncan Mounsor says "Several major UK cities are interested in setting up low emission zones and this kind of technology simplifies the screening of clean and grossly polluting vehicles without having to stop the vehicles to conduct the test or having to involve third parties such as the police".

- ET 01453 733214

# Change but no surprise in new strategy

Last month the Government released its new air quality strategy for consultation. What does it contain, asks Jack Pease?

It is several months late – and widely leaked – but the consultation on the proposed new air quality strategy is still something of an excitement (albeit tempered by the volume of the document!).

The inclusion of PM<sub>2.5</sub>, exposure reduction, ecosystems protection and endless analysis of real-life policies forms the basis of the excitement. Previous strategies have simply ummed and ahhed about limit values and objectives rather than contemplated real-life action.

The last full strategy was published in early 2000, but updated with an addendum in 2003. Defra and the three devolved regions have jointly prepared the new strategy, perhaps surprising given Scotland's differing aspirations for its own air. It has not signed up to the 'majority' view on particles.

Since the last strategies were prepared, Defra and the devolved regions have come under pressure to justify the strategy and what it obliges local authorities and industry to do. New health information and cost benefit research has provided sufficient robustness to the new strategy to defend most of the existing objectives, and allow discussion of new ones. There are several hundred pages in the strategy documents, and a further several hundred in supporting cost benefit and research information.

The headline message accompanying the strategy is that air quality action will save lives and be cost effective. Certainly the cost benefit ratios look impressive (£1.4bn a year) in contrast to the rather small improvements in life expectancy that will result from some of the actions proposed. But as the strategy is at pains to point out, air quality disbenefits are not spread evenly across the population, the poor can disproportionately suffer from bad air, so improvements are socially desirable.

Minister for the local environment, Ben Bradshaw, said: "Although our air is cleaner in overall terms than at any time since the industrial revolution, air pollution is not declining as quickly as expected. We need to move faster and take further measures to move us closer to meeting our objectives:

- We are expected to miss our targets for reductions in nitrogen dioxide, ozone and particles which can cause respiratory and cardiovascular problems;
- In 2005, pollution in UK expected to reduce average life expectancy by 8 months;
- In 2003, pollution in UK led to over half of natural and semi-natural habitats to exceed harmful levels of acidity."

The new strategy:

- Offers a package of measures which will reduce average exposure to air pollutants for everyone;
- If implemented could see increase in life

expectancy of three months by 2020; and

- Consists of a range of measures, including:
  - New tighter European vehicle emissions standards (so called Euro-standards);
  - Incentives for cleaner vehicles;
  - Further reductions in emissions from small combustion plants;
  - Further reductions in emissions from ships.

Bradshaw said that the strategy was based on one of the most comprehensive environmental studies carried out by Government: "In the past we have concentrated on the 'hotspots' where we may

“ Air pollution is not declining as quickly as expected ”

– Ben Bradshaw, air quality minister

not have been hitting our air quality objectives. This consultation suggests a much wider ranging approach for pollutants such as fine particles (PM<sub>2.5</sub>), which is cost effective, and geared towards improving public health in the UK."

The strategy takes stock on progress so far towards the objectives. In a nutshell particulates remain a huge concern for health, NO<sub>2</sub> is a liability in terms of breaching EU directives. It remains a health risk and background concentrations are worsening.

For lead, benzene, 1,3-butadiene and carbon monoxide, objectives are being met. For sulphur dioxide, although there are current monitored and modelled exceedences, the objectives are likely to be met almost everywhere by 2010.

As well as NO<sub>2</sub> and PM<sub>10</sub>, ozone and polycyclic aromatic hydrocarbon objectives are unlikely to be achieved everywhere. For instance for PM<sub>10</sub>, in 2004, PM<sub>10</sub> concentrations exceeded the 24-hour average objective for more than 35 days at the roadside monitoring sites at Marylebone Road and Camden and at the urban background site at Port Talbot.

The nitrogen dioxide annual objective was exceeded more widely throughout England and Scotland with 27 sites exceeding, of which 11 were non-roadside sites. Some 40% of the 85 network sites exceeded the ozone objective and the PAH objective was exceeded at four urban background or industrial sites in the national network.

Measurements show that long term reducing trends for nitrogen dioxide and PM<sub>10</sub>

are flattening or even reversing at a number of locations, despite currently agreed mitigation measures. Projections suggest PM<sub>10</sub>, NO<sub>2</sub> and ozone objectives will not be achieved by 2020.

## Costing and health benefits

A key feature of the current strategy is the focus on cost benefit analysis, itself hinging on having accurate health effect information.

With ever changing pressures on Treasury budgets from politically critical areas such as health, and very specific pressures from industry to cut what it sees as unnecessary red tape, Defra has to fight to keep the regulation it has, let alone make it tougher.

So even a stand-still strategy requires a bullet proof science and economic base. Much research has been done since the last strategy in these areas, and while the full understanding of why particles and other pollutants kill remains elusive, a good attempt has been made to cost the health effects. Detailed progress has also been made at costing action to improve air quality, and Defra quite unashamedly boasts some remarkable cost benefit scores.

The strategy says: "In January 2005, an evaluation of selected air quality policies in the road transport and electricity generation sectors showed annual health benefits relative to the expected outcome 'without policies' avoided the premature death of more than 4,200 people a year as well as possibly avoiding more than 3,500 hospital admission due to air pollution.

"The report suggests that the policies have reduced the life years lost in 2001 by between 39,000 and 117,000 life years compared with expected life years lost in 2001 without these policies.

"The economic costs and air quality benefits, relative to the expected outcome 'without policies', showed that policies generated more than £68,000m benefits to the UK at an estimated cost of £6,000m."

The strategy attempts to pre-empt resistance from the Treasury and industry against further measures by pointing out that the real costs of air quality measures are nearly always considerably less than anticipated 'ex ante' costs.

The strategy is far too polite to spell it out – but clearly feels that industry and the Treasury talk up costs of measures in a bid to resist them.

## Health

Assessments made for the strategy suggest that man-made particulate air pollution experienced in the UK in 2005 would be

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## ● continued from p7

expected to reduce average life expectancy by up to about eight months. This health impact in 2005 is estimated to cost up to £9.1-21.4 billion a year.

Looking ahead to 2020, based on existing measures already agreed, the eight month average reduction in life expectancy will drop to 5.5 months and the impact cost reduce to £6.6-15.4bn. In addition, a large part of the ecosystems will continue to exceed critical loads for both nutrient nitrogen and acidity in 2020.

The strategy says: "If a package of cost effective measures (including new European vehicle emission standards, a package of incentives for the early uptake of these cleaner vehicles and reduced emissions from small combustion plants) is implemented, it is estimated that average background concentrations of particulate matter in urban areas across the UK could be reduced by 15% between 2010 and 2020.

The average loss of life expectancy due to man-made particulate matter in 2020 would be about half a month less at the baseline 2020. The same package of measures would generate estimated costs of up to £6.0-14.2 billion a year. (a reduction of 8% compared with the baseline).

Previous strategies have relied on a 1% 'hazard' rate attributable to particles (a 1% worsening of health per 10µg/m<sup>3</sup> of PM<sub>2.5</sub>). This was all the cautious Committee on the Medical Effects of Air Pollution (Comeap) was ever prepared to admit – but more recently it has moved towards European and

World Health Organisation estimates of hazard rates approaching 10%. This makes action appear far more cost effective.

The strategy says: "The use of a greater reduction in hazard rate per µg/m<sup>3</sup> of PM<sub>2.5</sub> increases the chronic mortality benefits in a linear manner i.e. for a 1.1% reduction in hazard rate per µg/m<sup>3</sup> PM<sub>2.5</sub>, the chronic mortality values are almost twice as large as the values when assuming a 0.6% per µg/m<sup>3</sup> hazard rate. The net benefit for each measure therefore increases."

The behind-the-scenes prevarication on hazard rates has been echoed with rather more public angst about moving toward the PM<sub>2.5</sub> metric. UK scientists have been adamant that since health effects are clearly related to PM<sub>10</sub>, and that a huge database of PM<sub>10</sub> measurements exist in the UK, that it would be foolish to swap over to PM<sub>2.5</sub>. But the overwhelming view from environmentalists and overseas countries is to move towards the 'more dangerous' PM<sub>2.5</sub>.

Reluctantly the strategy embraces these views: "Whilst accepting the Expert Panel on Air Quality Standards and the Air Quality Expert Group's views on a PM<sub>2.5</sub> objective, from a precautionary approach perspective the UK Government and the devolved administrations believe that the recommendations provided by WHO with regard to PM<sub>2.5</sub> should be acted upon. The UK Government and the devolved administrations therefore propose that when new objectives on particles are set they should address the PM<sub>2.5</sub> fraction as well as

the PM<sub>10</sub> fraction.

Rob Pilling of the National Society for Clean Air (NSCA) had a number of comments to make: "We welcome the drive to improve air quality but are concerned that despite opportunities for cost beneficial action, pollution levels are not declining as fast as expected for NO<sub>2</sub>, PM and ozone. In particular, we remain very concerned that the objectives at some locations will not be met until well into the future.

"The benefits predicted for the full package of measures supported by the review are significant and welcome, though modest in relation to the total health and environmental costs of air pollution."

NSCA continued: "The analysis of potential measures to limit speeds to 60 mph is interesting. We are initially surprised that the inconvenience of slightly slower journey is considered to outweigh climate, air quality and safety improvements. We also wonder what benefits might be possible through the stronger enforcement of existing limits. Surely the inconvenience to those who break the law cannot prevent action?."

"Proposals for new ecosystem objectives for ozone, NO<sub>x</sub> and SO<sub>2</sub> are welcome. However, while setting targets, which will be achieved without additional action, is certainly 'realistic,' it can hardly be considered as 'stretching'," said Pilling.

● *Air Quality Strategy for England, Scotland, Wales and Northern Ireland* website [www.defra.gov.uk/corporate/consult/airqualstrat-review/index.htm](http://www.defra.gov.uk/corporate/consult/airqualstrat-review/index.htm)

# Action planning: full costs exposed

## The new strategy is big on action, and spends a long time costing that action

A key criticism of previous strategies has been the focus on objectives at the expense of action. That criticism has been addressed with the new strategy taking a lot of trouble outlining possible actions, and carrying out a rigorous cost and benefit analysis on them.

The measures are analysed in isolation, with some bundled up into packages, and are outlined below.

### A: new Euro standards – low intensity

The potential additional policy measure A is an EU wide measure that consists of new, stringent European road vehicle emission standards.

Measure A requires significant reduction in emissions of PM<sub>10</sub> from diesel passenger cars and light duty vehicles and some reductions in emission of NO<sub>x</sub> from diesel passenger cars, light duty vehicles and heavy duty vehicles. No reduction in emissions from petrol vehicles is included in this measure. The light goods vehicle proposal of this measure is very similar to the Euro V directive recently proposed by the European Commission.

The assessments carried out indicate that

Measure A can generate significant health benefits of up to 2.8m life years saved and significant net benefits to society of up to £1,039m per annum.

It will reduce exceedences of the national and European PM<sub>10</sub> 2010 objectives by about 50% by 2020, in particular eliminating all roadside exceedences of the PM<sub>10</sub> daily objective by 2020. This measure will also reduce some of the negative impact of air pollution on ecosystems. By reducing concentrations at roadsides, Measure A might lead to greater benefits in socially deprived areas.

### B: New euro standards – high intensity

Similar to Measure A above but tougher.

In addition to the reductions of PM<sub>10</sub> and NO<sub>x</sub> required in Measure A, this measure requires further significant reduction in emissions of NO<sub>x</sub> from diesel and petrol passenger car and light duty vehicles (albeit in a longer time-frame) and further significant reduction in both PM<sub>10</sub> and NO<sub>x</sub> from heavy duty vehicles. The light goods vehicle part of this proposal is more stringent on NO<sub>x</sub> limits than Euro V.

### C: Programme of incentives for early uptake of new Euro standards

This potential additional UK-wide measure is based on new Euro standards as described in Measure A above.

It consists of incentivisation packages aimed at reducing the cost of motoring for those motorists that choose to buy cleaner vehicles ahead of the date when they are legally required to enter the market. Cleaner vehicles are defined as vehicles that emit low quantities of NO<sub>x</sub> and PM<sub>10</sub>.

This measure brings the benefits of Measure A forward and therefore the benefits incorporate those of Measure A as well as the early incentivisation of the standards. This measure can generate significant health benefits of up to 3.0m life years saved and significant net benefits to society of up to £1,251m per annum.

It will also reduce exceedences of PM<sub>10</sub> 2004 objective near urban roads by around 40% by 2010, reduce background

● continued on p10 overleaf

## Objectives

**O**bjectives are a smaller part of the strategy than in previous versions, but nonetheless remain important. The strategy has been developed at a time of change in EU policy. The Commission has proposed a new style air quality directive to replace various daughter directives that will change many objectives. The UK strategy has had regard to this – not surprisingly both adopt ‘exposure reduction’ ambitions, given the idea was worked up in the UK.

The proposal for the new EU Directive relaxes many objectives, and this will cause difficulties for UK if it tries to regulate beyond the minimum. Scotland (covered by the strategy) has no such worries and is comfortable going beyond the minimum with its objectives. The strategy deals with pollutants in turn:

### Nitrogen dioxide

The strategy proposes to retain the current 2005 NO<sub>2</sub> objectives with the view to continue to stimulate progress at national and local level towards the EU legally binding limit values in 2010.

### PM<sub>10</sub> 2004

Growing concerns on particles leads the strategy to suggest retention of current 2004 daily and annual PM<sub>10</sub> objectives and to continue to work to eliminate all current exceedences as soon as possible.

### Ozone

It is recognised that measures that the UK can take alone to reduce ozone concentrations in the UK are limited and that this objective is somewhat more stringent than the relative EU target value. However keeping the precautionary principle in mind, and considering that:

- The increased evidence that ozone may not have a threshold and may therefore generate greater health impacts than previously expected;
- This objective is not prescribed in LAQM regulation; and
- This objective remains a national objective rather than a EU legally binding limit value.

The strategy proposes that the current objective is retained.

### PAH (polycyclic aromatic hydrocarbons)

Currently PAHs are not prescribed in LAQM regulation and the strategy says it is premature to change this because of high monitoring and analytical costs.

The strategy accepts that the current objective is more stringent than recently agreed in Europe. However with the precautionary principle in mind and considering that:

- PAHs are carcinogenic;
- This objective is not prescribed in LAQM regulation; and
- This objective remains a national objective rather than a EU legally binding limit value.

The strategy proposes that the current objective is retained with a view to consolidate current achievement and generate further improvements if possible. A review is promised soon.

### SO<sub>2</sub>, lead, CO, 1,3-butadiene and benzene

Current objectives for SO<sub>2</sub>, lead, CO, 1,3-butadiene and benzene are retained. However the 15 minute mean for sulphur dioxide appears vulnerable, it has been put ‘under review’.

### Vegetation: Nitrogen oxides (NO<sub>x</sub>)

The current NO<sub>x</sub> objective remains unchanged for all areas outside the exclusion areas.

In addition, it is proposed to adopt a long term aspiration that the critical level will be achieved at all SSSI, ASSI and Natura 2000 sites (including Ramsar sites), both inside and outside the exclusion areas. “The UK Government and the devolved administrations propose that the medium term objective towards our long term aspiration is to achieve NO<sub>x</sub> objectives at 99% of all sites, by area, by 2010.” This objective would be achieved by already agreed measures included in the baseline assessment.

Therefore the proposed new objective would generate no additional costs.

### Vegetation: sulphur dioxide

It is proposed that the current objective remains unchanged for all areas outside the exclusion areas.

The UK Government and the devolved administrations therefore propose to adopt a long term aspirational target of 100% of all SSSI, ASSI and Natura 2000 sites (including Ramsar sites) achieving annual average concentrations of 10 µg/m<sup>3</sup>.

Policies already included in the baseline assessment will result in this target being achieved at 100% of all sites by 2010. Therefore the proposed new objective would not generate any additional costs.

### Ozone

Currently there is no objective for vegetation and ecosystems for ozone. The strategy proposes to adopt the European target of 18,000 µg/m<sup>3</sup>.h averaged over five years based on AOT40 to be calculated from 1 hour values from May to July, and to be achieved by 2010 as a provisional objective, to be reviewed in the light of ongoing research into other metrics.

Policies already included in the baseline assessment will result in the provisional objective being achieved by 2010. Therefore the proposed new objective would not generate any additional costs.

### New objectives for particles

The strategy notes that current policy is focused on improving an increasingly smaller number of hotspot areas where objectives are not being met. Continuing this policy will be increasingly costly with little public health benefit, and an exposure reduction approach is proposed to spread the benefits across the wider population. The exposure reduction approach is formed of two “inseparable” components. These are:

- Air quality objectives/limit values (often called “backstop objectives” or “concentration caps”) to ensure some basic level of quality of air for all, ensuring “environmental justice”, and
- An objective based on reducing average exposures across the most heavily populated areas of the country (exposure reduction), in order to generate further cost effective public health improvements over and above the basic level of protection generated by the objective above.

The essential elements of an exposure reduction approach are:

- The definition of the current annual average concentration for a fixed set of urban background sites. This could be defined as a running average, probably over three years;
- The definition of a target reduction in this average concentration by a given date; and
- Monitoring of progress towards the target on an annual basis using the fixed set of urban background sites.

The strategy says: “Our initial assessment indicates that the UK is likely to be able to achieve the proposed concentration cap of 25µg/m<sup>3</sup> by 2010 nearly everywhere under already agreed policy measures. At certain particular locations (eg roads) and in certain weather, meeting the 25µg/m<sup>3</sup> cap could be challenging.

“The proposed PM<sub>2.5</sub> 20% exposure reduction objective between 2010 and 2020 is very challenging. Our assessment indicates that the UK can expect to achieve a maximum 11.5% reduction under the baseline and 15-16% reduction under combined Measure Q.

Scotland digresses at this point – but the other administrations consider it “premature” to set either the current PM<sub>10</sub> 2010 objectives or any new PM<sub>2.5</sub> objectives in LAQM Regulations. Therefore current objectives stand.

### Ammonia

The UK Government and the devolved administrations do not intend, at this stage, to set an air quality standard or objective for NH<sub>3</sub>.

## AIR QUALITY RESEARCH

The launch of *Air Quality Bulletin* coincides with a glut of news – and the all important air quality strategy. Normally we'd cover air quality research and science on these pages – but exceptionally this month, have given over the space to the extra news and the strategy.

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exceedences of PM<sub>10</sub> 2010 objectives by more than 50% by 2020 and reduce the NO<sub>2</sub> objective by nearly 50% exceedences near urban roads by 2020. This measure will significantly reduce the negative impact of air pollution on our ecosystems and may benefit deprived areas through the reduction in air pollutant concentrations.

#### **Measure D: Programme of incentives to phase out the most polluting vehicles.**

This potential additional measure consists of a UK based package to reward owners who choose to scrap their high polluting vehicles.

There are two sub measures:

**D1:** Provides incentives to phase out all pre-Euro standard cars (i.e. pre about 1992);

**D2:** provides incentives to phase out pre-Euro standard vehicles and Euro standard I cars (i.e. pre about 1996).

This additional policy measure can generate some small health benefits of up to 500 life years saved for D1 and 9,000 for D2. However the net present value to society of this measure is negative up to a net loss of at least £2m a year for D1 and £87m a year for D2.

This measure is expected to have a very small impact on reducing areas of exceedences and a negligible impact on ecosystems. However it does have distributional benefits as lower income groups tend to drive older cars which are being targeted by this measure.

This measure may also have noise benefits and may have a very small impact on reducing risks of leukaemia and lymphoma (due to reduction in both benzene and 1,3-butadiene emissions from vehicles).

#### **Measure E: programme of incentives for uptake of low emission vehicles**

This additional policy measure consists of incentivisation packages aimed at reducing the cost of motoring for those motorists that choose to buy the cleanest and most efficient vehicles available at the time.

The assessment carried out indicates that this measure can generate some health benefits of up to 204,000 life years saved and significant net benefits to society of up to £124m a year. By 2020 it will also reduce the areas of exceedences of PM<sub>10</sub> 2010 objectives by about 3% and reduce exceedences of the NO<sub>2</sub> objective near urban roads by about 9%.

#### **Measure F: impact of a national road pricing scheme**

This potential additional measure looks at the impact of a national road pricing scheme on air quality in the UK.

The assessment is based on some of the assessments (and assumptions) presented in the *Feasibility study of road pricing in the UK* published in July 2004. The figures

quoted for air quality benefits are based on further analysis of only one of the ten scenarios (each using different assumptions) that were considered in the context of the feasibility study.

The strategy say it is “highly unlikely” that any ‘real-world’ scheme would reflect the scenario that has been used for this assessment, therefore these figures can only be used for illustrative purposes to give an indication of the potential contributions that a national road pricing scheme might make towards improving air quality.

The analysis suggests that this additional policy measure could generate some health benefits of up to 398,000 life years saved and significant benefits to society of around £200m per annum of air quality benefits alone (although the total benefits of a national scheme may be much higher than this).

It could also have the potential to significantly reduce exceedences of PM<sub>10</sub> 2004 objectives near urban roads by about two thirds in 2020.

#### **Measure G 1-3: supporting delivery of a low emission zone in London and elsewhere**

This potential additional measure looks at supporting the Mayor for London in delivering a low emission zone in London.

The estimates for the total benefits and costs for this scheme are taken from work undertaken as part of the feasibility study of road pricing. There are three submeasures:

G1 assesses the implementation of a low emission zone in London in 2007, G2 assesses a more stringent London low emission zone from 2010, and G3 assesses the extension of low emission zones to seven other cities from 2010.

Although these would be local measures taken by relevant local authorities, central Government could facilitate consideration of the wider national agenda (i.e. consideration of criteria applicability in a national sense, availability of resources from relevant Government agencies to deliver assistance needed on technical and certification side, etc).

Low emission zone measures could potentially generate health benefits of up to 4,000 life year saved for G1, 6,000 for G2 and 2,000 for G3. However the net present value to society of this measure is negative generating a net loss to society of at least £1m per annum for G1, £2m p.a. for G2 and £13m p.a. for G3. Measures G2 and G3 will also reduce the exceedences of PM<sub>10</sub> 2004 objectives near urban roads by about 33% by 2010, which is significant given the timeframe.

#### **Measure H 1-3: programme of incentives**

#### **to retrofit diesel particulate filters (DPFs) to heavy duty vehicles (HDVs)**

This potential additional policy measure consists of incentivisation packages aimed at encouraging the retrofitting of different types of diesel particulate filters to a number of heavy duty vehicles and buses and coaches in circulation in the UK.

Measure H1 assumes that 65% of the existing fleet is retrofitted with diesel particulate filters (DPFs); Measure H2 assumes 20% of the fleet is retrofitted with platinum coated DPFs, Measure H3 assumes 35% of the fleet is retrofitted with platinum coated DPFs. This is a UK wide policy measure.

It is estimated that this additional policy measure can generate some health benefits of up to 27,000 life year saved p.a. for H1, 7,000 p.a. for H2 and 14,000 p.a. for H3. However the net present value to society of this measure is negative generating a net loss to society of at least £39m per annum for H1, £12m p.a. for H2 and £18m p.a. for H3.

This measure will have no effect on ecosystems but may benefit deprived areas through the reduction in air pollutant concentrations.

#### **Measure I: domestic combustion: switch from coal to natural gas or oil**

This potential additional UK wide policy measure is aimed at reducing the number of coal-fired boilers, replacing them with either gas or oil-fired boilers which will reduce emissions of harmful air pollutants.

It is estimated that this additional policy measure can generate health benefits of up to 15,000 life years saved. However the net present value to society of this measure is negative generating a net loss to society of at least £12m per annum.

This measure will have no or an insignificant impact on ecosystems. This measure has been assessed having distributional benefits especially in Northern Ireland and may have a small positive impact on reducing the risk of lung cancer (due to its impact on the emission of PAHs). Initial analysis points towards a negative competition impact and a possible disproportionate impact on small business.

#### **Measure J: domestic combustion: product standards for gas fired appliances**

This potential additional measure consists of setting strict product standard requirements (in terms of emissions of NO<sub>2</sub>) for all new boilers installed in domestic premises in the UK.

Additional policy Measure J can generate some health benefits of up to 177,000 life years saved. However the net present value

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to society of this measure is negative generating a net loss to society of at least £104m a year. This measure will have an insignificant impact on both the area of exceedence of air quality objectives and on ecosystems. This measure may, however, benefit deprived areas through the reduction in air pollutant concentrations.

### **Measure K: large combustion plant measure**

This additional policy measure requires early adoption in the UK of stringent EU requirements on emissions of air pollutants from large (above 300MW) coal-fired power stations (sub measure K1). It also introduces new technologies to reduce emissions of NO<sub>2</sub> from other large combustion plants for example gas fired power stations and refineries (sub measure K2).

It is estimated that this additional policy measure can generate significant health benefits of up to 66,000 life year saved for K1 and 574,000 for K2, and generate net benefits to society of up to £157m p.a. for K1 and £11m p.a. for K2. This measure will reduce some of the areas of exceedence of air quality objectives and it is expected to have a significant positive impact on ecosystems. The qualitative analysis suggests this measure may raise certain competition and security of supply issues.

### **Measure L: Small combustion plant measure**

This potential additional policy measure requires the reduction of pollutants emitted by small combustion plants (between 20 and 50MW).

Measure L can generate some health benefits of up to 241,000 life years saved and significant net benefits to society of up to £125m a year. It will have a very small impact on reducing the areas of exceedences of air quality objectives. This measure may also have a positive impact in reducing roadside concentrations which would lead to greater benefits in the deprived areas. It has the potential to have a disproportionate effect on small businesses.

### **Measure M: Reducing national emissions of volatile organic compounds (VOCs) by 10%**

This potential additional policy measure consists of packages of UK wide measures aimed at reducing national emissions of Volatile Organic Compounds (VOCs) which are ozone precursors. It includes a number of sub measures such as changes to some industrial operations and processes.

This additional policy measure will mainly affect ozone concentrations and can avoid up to 10 deaths brought forward per year and up to 12 respiratory hospital admissions a year. However the net present value of this measure is negative generating a net loss of £249m a year.

### **Measure N: Reducing emissions from shipping**

This potential additional policy measure focuses on reducing emissions from ships.

This is because emissions of NO<sub>x</sub> and SO<sub>x</sub> from ships have been found to contribute significantly to secondary particles formation and therefore background levels of PM<sub>10</sub> across the whole of the UK. This measure focuses on reducing the sulphur content of marine fuel and reducing emissions of NO<sub>x</sub> from ships' engines.

However in order to have a significant effect on air quality this measure would need to be extended to all shipping in seas around the UK and could therefore only be implemented via agreements of the International Maritime Organisation and its members.

Measure N can generate very significant health benefits of up to 2.2m life years saved and significant net benefits of up to £1,148m per annum. It will also reduce background exceedences of the PM<sub>10</sub> 2010 objectives by around 38%. This measure will also significantly reduce the negative impact of air pollution on ecosystems. This measure has no significant qualitative impacts.

### **Measure O: Combined package on transport: Measure C + Measure E**

This is the first of the combined packages that were assessed within the strategy.

It focuses on cleaning up transport emissions. It includes a programme of incentives for cleaner vehicles (Measure C) and to increase penetration of low emission vehicles (Measure E).

This potential combined package of measures on transport can generate significant health benefits of up to 3.1m life years saved and significant net benefits of up to £1,312m a year. By 2020 it will also reduce exceedences of PM<sub>10</sub> 2010 objectives at background by around 50% and reduce exceedences of the NO<sub>2</sub> objective near urban roads by around 55%. This measure will significantly reduce the negative impact of air pollution on our ecosystems.

### **Measure P) combined package on transport and industry: Measure C + L**

This combined package of measures on transport and industry includes incentives for the early uptake of cleaner vehicles (Measure C) and cleaner small combustion plants (Measure L).

Potential additional package of Measures P can generate significant health benefits of up to 3.3m life years saved and significant net benefits of up to £1,377m a year. By 2020 it will also reduce exceedences of PM<sub>10</sub> 2010 objectives at background by more than 50% and reduce exceedences of the NO<sub>2</sub> objective near urban roads by more than 50%.

### **Measure Q: Combined package on transport and industry: Measure C+E+L**

This overall package of potential additional measures includes measures to clean up transport as well as industrial emissions. It consists of incentives for the early uptake of cleaner vehicles (Measure C), a programme of incentives for low emission vehicles (Measure E) and the clean up of small combustion plants (Measure L).

This combined package of measures on transport and industry can generate significant health benefits of up to 3.3m life years saved and significant net benefits of up to £1,437m a year.

## Conclusions

By 2020 it will also reduce exceedences of PM<sub>10</sub> 2010 objectives at background by about 55% and reduce exceedences of the NO<sub>2</sub> objective near urban roads by about 60%.

The strategy says: "In summary, the evidence indicates that the following additional policy options could, if implemented, generate significant net benefits to society, significant improvement for ecosystems and habitats and help the Government move closer to its air quality objectives by eliminating a significant number of areas of exceedence. "Measures A, B, C, N and combined scenarios O, P and Q are expected to be highly beneficial to society as a whole and generate very large positive annual net present values (of the order of up to £1,300m net benefits a year. Therefore the UK Government and the devolved administrations are seriously considering implementing, or arguing for strongly in relevant fora (such as within the European Union), all these measures.

"Measures D, G, H, I, J, K2 and M are expected not to be beneficial and generate negative annual net present values (£250m per annum)."

In addition, the strategy says:

- Some local transport measures can be effective at significantly reducing air pollution (e.g. low emission zones, local speed restrictions);
- All other local transport measures (e.g. those aimed at reducing congestion, or improving public transport) can have an impact in improving air quality even if smaller than those measures directly aimed at air quality improvements;
- Local transport measures, as outlined in the *Smarter choices* report, can improve air quality and reduce carbon emissions cost effectively;
- Further restrictions on speed limits are not cost effective when applied nationally, but can be in certain limited local areas; and
- Some cost effective reductions in emissions (of both air pollutants and carbon) could be achieved by more sustainable freight distribution.

"Local authorities should have in mind the measures listed in the above paragraphs as they develop their local transport policies. It is not the UK Government and the devolved administrations' intention that the measures assessed require funding beyond that which has already or will be provided.

"Therefore the UK Government and the devolved administrations will ensure that the final strategy published after this consultation document does not impose additional costs on local authorities, unless additional funding is provided.

# HOT AIR

We hope this edition of AQB is fresh and different – yet familiar to ‘other’ products out there!

There was much talk of the new venture at the NSCA's spring workshop – and for many, the first question was – would there still be the back page ‘funnies’? We are happy to say that these will continue!

And thanks for the good wishes for the new venture. One émigré from a large consulting conglomerate said the freedom from mindless bureaucracy will be welcome.

Commenting on marketing blurb that contained what I had thought was a good picture of myself, another consultant suggested that the picture made me look thin and haggard – was I trying to play the ‘hunger card’ to get people to subscribe?

At that conference, Davide ‘laggard’ Minotti (bless – he’s off) was billed as *LAQM News*. Chairman Steve Moorcroft pointed out that this sounded like a rival publishing venture to the *Air Quality Bulletin*. Don’t you dare, Davide, there definitely isn’t room for three newsletters!

Anyway, he was clearly more relaxed than usual at the workshop – did the jeans suggest he was demob happy? And in an

uncharacteristic slip in his presentation – he talked about a “more negative” assessment of air quality in the LTP process – very quickly changed to “less positive” remembering that everything is always positive in the civil service.

And another slip up – perhaps a sign of the gerrymandering that will inevitably dog the Project Heathrow work on air quality.

Leeds University’s David Carslaw put up an overhead showing concentrations at the nearest receptors to Heathrow. The slide was accidentally blank – hey – leave the stitch-up to the ministers!

*Air Quality Bulletin* was arm-twisted to formally sponsor the ‘Jack Pease Bottom’ award (long story) for the most-mentioned people in the air quality press.

This award was instigated by the irascible Sarf London pair Jon Fox and Andrew Whittles of Bexley and Greenwich, the latter being last year’s winner (he apparently broke

the original ‘bottom’ statuette).

Air quality bigwigs Steve Moorcroft and Duncan Laxen were joint winners for most mentions in 2005. In the anarchic and arbitrary spirit of the award, they are duly barred from winning any award for 2006, so opening the field for new talent.

Pictured winning the award at the NSCA Spring Workshop are (left to right) Moorcroft, Laxen and Fox.



## AIR QUALITY EVENTS 2006

**May 16-18th**

**ET 2006 Conference and exhibition**

to be held in Birmingham, [www.et-expo.co.uk](http://www.et-expo.co.uk)

**May 30-31th**

**Health risks of heavy metals from LRTAP.**

9th meeting of the Joint Convention/WHO Task Force on Health Aspects of LRTAP. Berlin, Germany, [www.euro.who.int/air/newsevents/newsevents](http://www.euro.who.int/air/newsevents/newsevents)

**June 5-9th**

**Fundamentals in toxicology for health protection**

HPA course to be held King's College, London, Karen Hogan, 0207 771 5384 or email [chemicals.training@hpa.org.uk](mailto:chemicals.training@hpa.org.uk)

**June 6th**

**Seminar on ozone pollution**

To be held at the Franklin-Wilkins Building, Kings College London Contact Sally May, NSCA, 01273 878770

**June 9th**

**Air quality strategy review consultation:**

Multi-Stakeholder Workshop organised by NSCA to discuss the strategy consultation, to be held in , Contact Sally May, NSCA, 01273 878770

**June 22nd**

**Air quality impact of the Buncefield oil depot explosion**

Fifth Air Quality Forecasting Seminar to be held at Culham Science Centre, near Abingdon, Oxfordshire, Sue Powditch 0870 190 6551 or at [sue.powditch@aeat.co.uk](mailto:sue.powditch@aeat.co.uk)

**July 4th**

**IAQM on the Air Quality Strategy**

consultation meeting on the Air Quality Strategy to be held in central London followed by IAQM committee meeting [www.iaqm.co.uk](http://www.iaqm.co.uk)

**October 26th**

**Environmental and public health training day**

Advanced update to include Integrated Pollution Prevention and Control, Sherman Education Centre, Guy's Hospital, London Karen Hogan, 0207 771 5384 email [chemicals.training@hpa.org.uk](mailto:chemicals.training@hpa.org.uk)

## AIR QUALITY BULLETIN



Welcome to *Air Quality Bulletin*, a monthly newsletter covering air pollution, its management and its consequences.

We welcome your comments and contributions and hope you enjoy reading it.

*Jack Pease*

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