

IAPSC Discussion Sessions – December 2001

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Question from: Duncan Laxen – Air Quality Consultants

For: Mark Broomfield

Two part question:

- 1) Monitoring data – you've said that the monitoring data that is being fed into the episode protocol comes from the national network. Now, the national network wasn't set up to really look at point-source contributions to air pollution, but we know that industry has some monitoring networks of its own; the electricity industry certainly has monitoring and I believe that the EA (Environment Agency) is encouraging other industries to set up monitoring. Is there a way that the monitoring data around industrial sources can be fed into the episode protocol system?
- 2) Information – there is clearly a lot of information in the manuals that you've put together that will be useful for local authorities (LAs) in understanding episodes and be able to interpret them, and possibly even the system itself providing information for LAs. I was wondering if the EA might make that available more widely to LAs?

Answer

I think, on the first point, there's no reason, in principle, why those monitoring stations shouldn't be linked in to the system as a whole. We did discuss this at the time, and I think the main practical issue is linking the monitoring sites relating to industrial processes into the national database. Obviously they're not part of that national database and I think there is possibly a certain amount of resistance from the operators of the processes for that data to become available on-line on an hour by hour basis as the national network is. But, in principle, there is no reason why not. The other aspect, of course, is the quality control procedures that are in place for the national network, you would also want to be confident that those procedures were being followed and operated in any other new sites that come into the system. That would make it more useful and obviously, one limitation is that the main issue that the national network is starting to deal with is traffic, which is not the EA's problem, and so we do end up screening out a lot of non-relevant episodes and it would help from that point of view.

In terms of making it available to LAs, as I said, the Agency has no plans to develop the system itself. However, it does generate a lot of useful information and the spreadsheet that I showed you is very good, in that it gives you an auditable record within five minutes of receiving the data, at very little effort. That kind of system, I'm sure, would be of interest but the system would need to be adapted to make it relevant to needs of LAs. I'm sure the Agency would be very happy to talk about taking it further in that way, especially if they didn't have to pay for it.

David Muir, Bristol City Council

I'd just like to add a local authority perspective to that. You said that many of the episodes that you filter out are traffic related, those are obviously going to be of very

great interest to LAs so I think it would probably be very beneficial, certainly to the larger LAs, if some sort of access could be arranged to this system.

Mark Broomfield

I'd certainly be very happy to speak to you, and anybody else who is interested, afterwards about seeing if we can set up that kind of linkage. My point was really that the system at the moment is set up to specifically exclude that and it just needs a bit of adaptation to turn it on its head, if you like, and include all the episodes that have been excluded for the Agency and give information that's going to be useful for people like yourself David.

Question from: Graham Wilson, Leeds City Council

For: Paul Willis

You said in your presentation that you were hoping to inform the public by the forecasting process and then you went on to explain the broadcast sites DEFRA, Teletext, Ceefax etc. You also mentioned the web and email and I was wondering whether the email process is going to local media outlets, such as local radio and TV stations, so they automatically receive the information and can automatically put it out into the public domain.

Answer

The short answer to that is yes. The email bulletins go out to over a 100 recipients, a number of those are media organisations. It's a freely available service and really it's just getting the message to the local media services out there that they can approach us and this information is available so, if you want to put people in touch with us at a local level, then please do.

Question from: George Waterhouse, South Kesteven

For: Iain Beverland

You've re-looked at the 1952 work as a starter for looking at deaths and related things; does your re-look include particle size, effects of particle size through that. Because the clean air act brought dramatic drops in large particles, which are really the smoke, and now we're down at the PM₁₀ sort of level, how does that effect your results?

Answer

The first response to that is that the re-look is not really mine. The credit should go to people in Maryland, a couple of PhD students who had recently re-published the re-analysis and the environmental health perspectives. However, I read this paper with some interest. The issue of particle size is an interesting one, especially when you consider black smoke because they were reliant on the black smoke metric as that's all they had, they had no expensive PM₁₀ monitors at that time. But some work by a physicist in, I think, Austria has shown that it is often these very fine particles that contribute most to the black smoke metrics because of surface area and optical characteristics. So they're working purely with blackness which is a measure of carbon content of particles but, to a certain extent, is size dependent. More work needs to be done to establish how size dependent.

Question from: Jane Cloke, TRL

For: Paul Willis

How accurate are the five day forecasts that you're doing for the BBC. I'm thinking really in relation to where a local authority might want to do some sort of traffic management in order to alleviate a future episode.

Answer

I think it's fair to say that, from DEFRA's point of view, they've looked at the available evidence and they currently want to stay with the forecast for one day head. For the BBC's purposes, which are partly cosmetic, they wanted a five day forecast for their BBC on-line service and certainly once you get beyond three days you move into a different resolution of meteorological forecasting and, beyond that, it's really questionable about the accuracy. Out to three days ahead, I would say that we can be fairly confident.

Questions from: Mark Daly, Sheffield City Council

One For: Mike Woodfield and **one for** Paul Willis

Firstly, for Mike, where are the remaining 10 PAH stations going to be established and, for Paul, regarding the 35% and 80% times that you get it right for PM₁₀ and ozone – are there any areas in the country where you're always getting it wrong or always getting it right?

Answers

Mike

I'll need to look that up for you over the lunch break.

Paul

For the 80% ozone success rate, then certainly it's easier to forecast ozone episodes in the southern part of England where you get transboundary pollution coming across from Europe and we can model that very well. It's more difficult for UK based episodes where you have re-circulation of air and it's more difficult to model that. We would say 80% is still a fairly good success rate. For PM₁₀, because there are many more local effects incidents which are, for example, due to stone cutting near Manchester or due to PM₁₀ emissions from industrial plant say in Scunthorpe or Port Talbot, then it's very difficult to predict those incidents. Whereas episodes which are due to motor vehicle emissions i.e. from area sources, we can predict those fairly well. So when we're talking about episodes which cover the whole of a major conurbation, then we can predict those fairly successfully.

Question from: Tim Williamson, NSCA

For: Martin Williams and input from the rest of the panel

This is about the potential value of local air quality management (LAQM) in reducing air pollutants, particularly PM₁₀. Martin showed the modelling for 2010 based on a possible raft of national measures which showed compliance with the tighter proposed objective for PM₁₀ for the most of the country (other than some of the areas in London). I'd just like comments on the likelihood of whether LAQM can fill that gap or not and whether LAQM will fulfil its potential.

Answer

Yes, that's a good question Tim. LAQM is obviously going to be proportionately more effective for something like NO₂ where the sources are predominantly local. It will inevitably be less so for PM₁₀ looked at generally. On the other hand, a lot of the

problems that counterbalance that overall sort of picture, problems with PM₁₀, are roadside problems, so that kind of neutralises and brings it back up the agenda. So there is no reason why you shouldn't think that LAQM could help PM₁₀ as well and perhaps, in proportional terms, may be even as much as the NO₂ problem. That's probably about as far as I could go speaking generally and nationally without looking at individual cases. It will remain to be seen, on an individual case by case level, exactly how effective these things can be but, simply because vehicles are overall a smaller proportion of the PM₁₀ burden, doesn't necessarily mean that they're going to be as equally ineffective as you might think. So, by no means dismissable and every reason to hope they'll clean up quite a lot of the problems that we have with PM₁₀.

Question from: Zoe Burns, City of York Council

For: Martin Williams and/or panel

During your presentation you quoted a 74% reduction in NO_x as part of your modelled output, between 1990 and 2010, I assume in that you used emission factors. My questions was that, as most local authorities know, the emission factors are about to be revised. When are LAs going to be given those emission factors and how are we meant to take it into account when we're action planning to get the public's support, because what LAs won't want to do is increase their AQM area or have to go back and increase their action plan area.

Answer

You asked when, firstly, may be I can just back track. The point about this whole exercise is that the change of emission factors is such an important one, that we felt it was sensible to go out to consultation to open these things up. It's all part of the whole, changing methods of building science into policy that government is undertaking – post BSE, post foot and mouth and all these things embodied in the Phillip's report on BSE. So there's this idea that the more you can consult, the more open and transparent you can be, the more robust will your policies be. Well that's fine. That's all very well, of course, but it goes against one of the problems that Rupert raised, which is this long lengthening of the process and the problem of changing deadlines and all that.

Also, as Rupert said, it would be silly in many ways to ignore the progress of science. There were some gross approximations and assumptions in that old set of emission factors, not least some of the particle emission factors which were really plucked out of the air on the basis of no information whatsoever, three or four years ago whenever they were instituted. There was also the assumption made that, simply because regulated limits of vehicle emissions came down in certain proportions, the real world emissions came down in exactly the same proportions and a lot of the more recent evidence has suggested that's not the case. For example, it looks as if, to meet the Euro 1 regulations, that vehicle manufacturers were actually under-shooting by quite a long way so that when the Euro 2 regulations came in, much below the Euro 1 regulations, we assumed the emissions would go down as well. Chances are that they probably haven't done so by anything like as much. So, it really does behove us to build in as good science as we can, to make it as realistic as we can. The consultation process ended last Monday, two days ago. Our colleagues, in what's now DTLR, have to sift all the responses and come to some view as to whether we ought formally, as it were, adopt these emission factors in all our systems and, I'm guessing, that'll probably take a couple of months. So, yes, I accept that it hasn't made life easy for

you, on the other hand, in the long run, in practical terms, I don't know how much difference it will make. There were recommendations made early on that you should embody a certain element of uncertainty in all your assessments. So that, if you model the annual mean of 39mg/m^3 instead of 40mg/m^3 for NO_2 , then you might think twice about not declaring an AQMA and so on. But, more than that really, I don't think I could say. It's still going to take a little while to get these formally rubber stamped.

Rupert

I'll just add two points. Advice on when to start using these new factors and how to use them, including a user friendly (I hope) spreadsheet which allows authorities to put in numbers and then compare their results with the old factors and the new factors, is all available via the various electronic helpdesks that we've set up. Including, in particular, the modelling – the Stanger modelling - helpdesk website. So, do have a look at that and that gives detailed advice, as I say, on when you start using them, how you start using them and what it may mean etc.

The only other thing I was going to add was that, at the very beginning of your question, you mentioned this 74% figure that Martin threw in for the total NO_x reductions between 1990 and 2010. I think it's probably true to say, isn't it Martin, that with the new factors that figure probably would change a bit, it wouldn't be an order of magnitude different, but it would no longer be 74%. It would probably be more like 60% or something similar.

Martin

Yes, it will, but don't forget, of course, that the change in NO_2 concentrations, which is the crucial thing, will be damped and will be a lot less proportionally than the change in the total NO_x emission number that we've talked about there.

Question from: Tim Collins, Signal

For: Martin Williams and Rupert Furness

Are you concerned that, as the PM_{10} levels are going to be difficult to achieve, the measurement technique that most of the local authorities have used appears to be rather suspect in its accuracy?

Answer

Martin

Well, yes, it's potentially actionable, I suppose, to say that the instrument techniques that they used are suspect in their accuracy. But that's for others to decide. It's not so much that they're suspect in their accuracy as their representativeness in what they measure, of course, which part of the PM_{10} fraction. What all those maps showed was an attempt to correct the TEOM based measurements for the fact that they do miss certain parts of the particle fraction. You probably couldn't read the slides because the print was small, but in brackets it had gravimetric. What we've done in generating all those maps was to multiply the TEOM data by the famous factor of 1.3. Marion Wichmann-Fiebig mentioned this process of demonstrating equivalents with the reference method which, for PM_{10} , of course, is gravimetric. We're still going through that process. We've got an exercise, that's been going on for the last couple of years, running side by side in a range of locations in the UK with the gravimetric reference method and the TEOM method and we'll be trying to pull together some

more robust relationships between the two. That said, we are also increasing the number of gravimetric analysers in the network. We now measure at more locations with those. But, yes, it is difficult. We've done, I think, as good a job as we can nation-wide to try and correct for these things. Such results as we've had, so far anyway, give us the sort of comfort that the 1.3 factor, if anything, suggests that we might be erring on the side of conservatism in the sense that we're kind of over predicting, or making the picture look a little bit worse, with respect to the mandatory limit values. But, you know, the situation's fluid. I think all I can say really, on that, is that we're doing the best we can. But, if you can think of ways that we can improve we'd be glad to hear from you.