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Dear Sean,

Response to Defra consultation on review air quality management in England – December 2014

Introduction

The public health burden of exposure to outdoor PM2.5 is estimated to be equivalent to 29,000 deaths per year in the UK (COMEAP, 2010), whilst reduced exposure could yield annual benefits of £9-20bn (Natural Capital Committee, 2014). The recent World Health Organisation (WHO) Review of evidence on health aspects of air pollution (WHO, 2013a) process made clear the health burden from air pollution concentrations *below* EU Limits, making a powerful case for their tightening. Using outputs from the WHO (2013b), estimates of the health impact from NO2 in the UK look set substantially increase what we know as the air pollution health burden. In contrast to the other main causes of premature death such as obesity, smoking and alcohol abuse, air pollution is not in the main part a lifestyle issue but is inflicted upon us through the state of our environment.

The 1952 London smog taught us about the impacts of short periods of high air pollution. In the 1990s we learnt of the greater harm caused by long-term exposure to everyday air pollution concentrations. Emerging evidence that air pollution affects children's lung growth could change our perspective on vulnerable populations and place a new emphasis on managing air pollution exposure through the life-course.

The UK needs an air quality management system to meet these twenty-first century challenges. The societal cost of ineffective or non-action cannot be ignored.

Air quality work at King's College London

For the last 22 years, scientists at King's have been closely engaged in air quality management providing research evidence, support and advice to national, London and local government along with other organisations such as Public Health England and the Environment Agency (EA). As a university research group we are unique in the UK in spanning the air pollution problem from the source of pollutant emissions, through to the measurement, modelling, assessment of health effects and the supply of information to the public.

Our response

Our response is structured around the questions in the consultation document, beginning with the statutory instrument and then the consultation and impacts statement. Our response to question 3 in the consultation document is divided into seven thematic areas:

- Streamlining of reporting requirements.
- Air quality management areas and action plans.
- Local authorities and PM2.5.
- Clarification of roles and responsibilities.
- Evidence based policy.
- The importance of local assessment and community engagement.
- National frameworks for local action.

1) Draft statutory instrument

Paragraph 6: There is considerable scientific and public concern about air pollution exposure in enclosed spaces that are open to the public. For instance, many vulnerable members of the public are exposed to pollution in areas such as railway stations and underground railways and these could be considered within the scope of the regulations.

With regard to the current paras 7 to 12 there are many technical problems:

Para 7: There is a typo, presumably the "5" should be replaced with "%".

Para 8: Needs to refer more clearly to the calendar year.

Paras 9 to 12: The current wording excludes many EU reference instruments due to a 10 second sample frequency, which is shorter than the time resolution of most commercially available NOX, SO2 and O3 analysers. Continuous daily PM10 sampling definition is not possible due to filter changes for instance and the majority of equipment in the AURN actually measures PM concentration for around half of the sample time within each hour.

It would be clearly desirable to have a consistent definition of pollutants in the UK Local Air Quality Management and also the EU Directives. The current proposed wording in the statutory instrument could lead to a very confusing situation with different pollutant definitions in LAQM and the EU Directive. In addition to confusing the expert and non-expert alike the proposed differences between pollutant data capture definitions between EU and LAQM would lead to additional processing costs and challenges for all those that have to calculate results according to both systems. This includes software and web designers as well as local authority (LA) officers.

As discussed in our response to the 2013 LAQM consultation, there are many reasons not to fully align the LAQM assessment methods with those for EU limit values. However, we should endeavour to at least align the definitions of the measured quantities and definitions of averaging times. This would require a re-write of paragraphs 7 to 12.

Having defined the pollutants in a manner consistent with the EU definitions; the assessment methods between EU and LAQM should diverge reflecting and maximising the added value that can be obtained from the current LAQM approach. Assessment methods for LAQM are already defined separately in guidance and this should continue.

2) Removing CO, Pb, Benzene and 1.3 butadiene from LAQM

To our knowledge only one AQMA has been declared for these pollutants. We therefore support their removal from the LAQM regime. However, given the hazard posed by these substances and in the absence of evidence to indicate a zero effects threshold, a baseline measurement programme should continue to provide urban exposure information on these pollutants in case standards tighten in the future. This should be carried out by Defra outside of the LAQM process.

We support the retention of the 15 minute objective for SO2. This is important for consistency between UK objectives and the WHO guidelines.

3): Evidence on proposals in part 2 of consultation document

Streamlining of reporting requirements

Table 2 in the consultation document illustrates the plethora of reports routinely required as part of the LAQM process. We agree that it is rational to streamline these. Combining LAQM evidence and progress reporting into a single annual report will improve the transparency of the LAQM process for members of the public. This increased transparency will also facilitate interdepartmental work within local authorities and between the various organisations essential to the delivery of LAQM.

We have three areas of concern with respect to the proposed changes:

1) The LAQM process has historically involved a stepwise approach such that local authorities with few air pollution problems only had to complete part of the assessment and reporting process. The proposed approach implies the same reporting requirements for all local authorities regardless of their ambient pollution problems. This will place un-necessary burdens on some local authorities.

2) The current LAQM technical guidance (TG09 – Para 1.41) states that "In the majority of cases, it is envisaged that a Detailed Assessment will be required to support any decision to amend or revoke an AQMA. The proposed removal of Detailed Assessment from the reporting process will make it difficult for AQMAs to be amended or revoked in response to changing pollution circumstances.

3) The consultation suggests the amalgamation of the current reports. It does not remove the need for screening of sources, detailed modelling and monitoring, source apportionment and scenario modelling that are necessary for targeted action planning. By contrast the Impact Assessment states a cost saving. These two documents are therefore inconsistent and one must be misleading. A more open discussion of the proposed changes to LAQM guidance and the proposed annual reporting are necessary to enable a meaningful impacts assessment to be conducted. We find this lack of candour surprising given the controversy generated by the 2013 consultation and the levels of damaging mis-trust that arose between Defra, local authorities, stakeholders and the public. In our view much of the evidence gathering, measurement, source apportionment and analysis of progress are vital for an evidence based approach to LAQM and thus, the administrative savings would be small.

Air quality management areas and action plans

We support the retention of air quality management areas and action plans but the removal of detailed assessment removes a route for the revocation of an AQMA.

Action planning needs to be informed by a better evidence base and enabled through a national framework of actions which local authorities can adopt.

Local authorities and PM2.5

We welcome the inclusion of PM2.5 in the LAQM process. This reflects the acknowledged health impact of this pollutant and will provide for better alignment between LA LAQM and public health duties.

However, the current wording is too weak to promote action. We suggest an addition to the proposed wording in the consultation beyond a requirement for local authorities to have "regard to PM2.5" in their air quality management work. Instead local authorities should be required to "work towards a decrease in public exposure in all aspects of their work". In addition to strengthening the requirement for action the explicit inclusion of exposure would more closely align LAQM with LA public health duties and also the EU Directive requirements on central government.

Local steps to decrease PM2.5 exposure could be accomplished by:

- A decrease in emissions from primary pollutants.
- A decrease in the emissions of PM2.5 precursers. Particulate nitrate and volatile organic compounds make a large contribution to our PM2.5 concentrations and exposure. These arise from many sources including a sizable contribution from traffic and industry. Measures taken locally to decrease NOX emissions from traffic for example, would be beneficial.
- Good design in the planning process to encourage low emissions development.
- Good design in the planning process to separate the public from areas with high concentrations of PM2.5; planning of low pollution routes to schools and the design of school sites for example.
- Greater active travel; walking and cycling along low pollution routes providing many public health co-benefits.

Local measurements provide important local evidence for community and political engagement and for local accountability. This should be recognised as an important motivation for local measurement of PM2.5. During the previous consultation considerable evidence was submitted, pointing out weaknesses in national assessments. Whilst these might be suitable for EU reporting, their poor spatial resolution might also be a motivating factor for local PM2.5 measurements. Of prominent concern is the new trend towards solid fuel burning that is estimated to contribute around 1.1 μg m^{-3} to PM2.5 in London (Fuller et al 2014) and is not resolved in national assessments.

Clarification of roles and responsibilities

The current proposal to clarify and reiterate roles and responsibilities will achieve little.

Whilst lower tier authorities are responsible for LAQM, action in the vast majority of AQMAs must rely on highways authorities and the Highways Agency (HA). To achieve greater actions, increased involvement is needed from all stakeholders, with new requirements on upper tier authorities and the HA to actively assess air quality across the geographic areas that they are responsible for and to pro-actively work on decreasing pollution emissions. As transport authorities, upper tier authorities and the HA, should review, assess and actively manage air pollution for the *achievement* of the air quality improvements. This should form the structure of a new local air quality management regime rather than the current focus on lower tier authorities only.

With the publically-owned road infrastructure being a major source of outdoor exposure to harmful air pollution it is inexcusable that the state agencies that own and manage these assets do not have harm reduction as a central part of their mission. It is insufficient to be able to set standards for individual vehicles and then ignore the impact of their use on this publically owned infrastructure.

Today roads are the safest that they have ever been despite increased vehicle numbers and road accident deaths are considerably smaller than those attributable to air pollution. Road design and operation has played a huge role in safety improvements. A similar approach needs to be taken for air pollution. Those responsible for transport infrastructure need to ensure that it constructed, operated and used in a manner that decreases public health burden of air pollution.

It is clear therefore that Defra cannot manage air pollution alone. Other government departments and agencies also have a role in achieving the air quality standards and objectives. As many of these department and agencies are outside the remit of Defra, there is a need for someone to have an overseeing role. With this in mind we suggest that an office of Air Quality Commissioner (AQC) be created. We see this role as independent of government with the power to scrutinise, adjudicate, recommend and direct stakeholders on air quality actions. (Note - this is distinct from that of Air Quality Expert Group, who provide advice on science only). The creation of this office would permit a separation of the two roles currently held by Defra, that for delivery and as overseer.

Evidence based policy

While considerable progress has been made in decreasing concentrations of many pollutants such as CO, benzene and SO_2, very substantial progress is still required to reduce concentrations and public exposure to NO_2, O_3, PM_{10} and $PM_{2.5}$.

In their 2003 report the US Health Effects Institute set out an accountability chain linking regulatory action to consequential emissions reductions, with improvements in ambient air quality, through to exposure / dose reduction with a final end point of human health improvements (Figure 1). At all stages assessment of effectiveness provides feedbacks to create improved action. Inclusion of such an approach in LAQM would help to ensure that action plans are revised as they progress. This would guard against heath burdens from air pollution being endured for longer periods than necessary and money and effort being expended on non-optimal actions.

We accept that not all measures can be assessed through improvements to air quality concentrations; however other metrics can be devised such as traffic reduction, modal shift or increased public awareness. Such feedbacks should be built into action planning and interventions at all levels, and through these, best practices identified so that a rigorous approach to policy evaluation can be established. This could be a task for the Air Quality Commissioner or as a part of Defra's research programme.

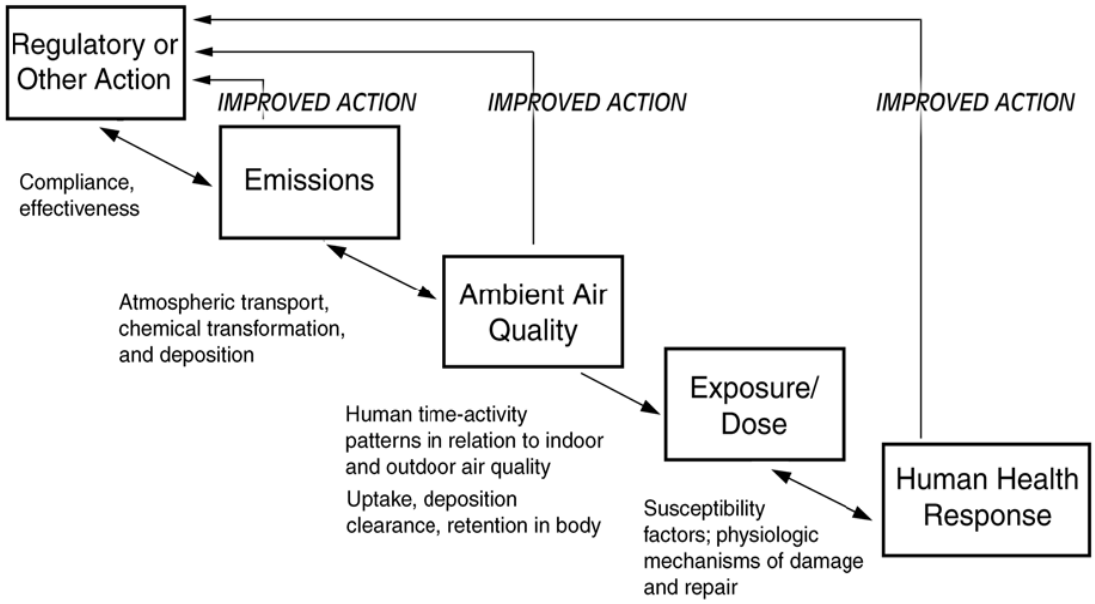

Figure 1 The so-called accountability chain, at several stages, knowledge gained from accountability assessment can provide valuable feedback for improving regulatory or other action. HEI, 2003.

Although LAQM has been criticised as being diagnosis driven, this diagnosis cannot be ignored. A focus on the important transport and other levers needs to be evidence based and supported by robust monitoring of air quality, assessment of emissions and dispersion modelling. Otherwise, schemes to improve air quality e.g. those based on clothing, paint, trees, screening, etc that are extremely unlikely to improve air quality, might predominate.

Defra should to commit itself to establishing and maintaining a body of evidence that would allow the action planning process to be significantly streamlined leading to reduced cost and more direct action. This evidence cannot be sensibly collectively gathered by individual local authorities but should be established by Defra to provide support for the LAQM process.

The importance of local assessment and community engagement

While it could be argued that the national level assessment reporting is fit for purpose for the EU, where attainment at a zone or agglomeration level is the reporting goal, it lacks the granularity to capture the spatial variations in air pollution emissions and exposure. Local action based on national assessments runs the risk of actions based on a misdiagnosis of sources. For example the national assessment of Brighton and Hove shows several main roads to have short lengths of NO_2 EU limit value exceedence, whereas the LA assessment reveals the national NO_2 air quality objective is exceeded across a large network of roads. The LA source apportionment also reveals a diversity of traffic mix related causes in different locations.

Much more needs to be done to improve the quality of local assessments. Too many air pollution monitoring programmes focus on ascertaining if a national air quality objective has been exceeded and not why it has been. More guidance is needed on how to make effective air quality measurements, moving beyond problem identification towards improved diagnosis and the provision of optimal apportionment information to inform actions. Numerous examples of such strategies are available (each with their own strengths and weaknesses) that can be adapted to specific local air pollution questions to ensure that monitoring is carried out cost effectively.

Local communities have a vital role to play in decreasing the impacts that air pollution has on our society and economy as a whole. This can be through applying pressure for greater action from stakeholders, to actions to decrease emissions and preventative measures to lessen personal exposure to air pollution.

For local communities to be engaged in air pollution issues they need local measured data and the outputs from local assessments. These need to be accurate and of good quality to be trusted. Numerous examples can be cited where local information has prompted many business groups, residential groups, cycling organisations and environmental groups to become actively engaged improving the air pollution that they, their workers and customers are exposed to. By reducing local assessment we are convinced that local pressure to improve air pollution will become unfocused, accountability will be absent and important issues of exposure to local air pollution will drop from local debate and action.

Staff from King's frequently encounter high levels of interest and concern when giving public talks both across the UK. Further evidence of high demand for local air pollution information is provided through the public use of the LondonAir smartphone applications and websites.

The diminution of local measurement within the Impacts Assessment is not consistent with the aim of the main consultation that seeks the amalgamation of reporting requirements only. Confusingly, the Impact Assessment also justifies the reduction in measurements on the basis of budget constraints. If this is the case then such budget constraints should also be in the business as usual case and would have no nett effect.

We note that the consultation website now states that no decrease in NO2 or PM10 measurement is foreseen. The current consultation is therefore unclear and potentially misleading. In addition to the ambiguity on intentions for future measurement we consider that the cost savings from changes to the reporting process are overstated. This is because many of the activities would need to be maintained to ensure an evidence based approach to LAQM and the tracking of action plan progress.

National frameworks for local action

In contrast to AQMAs at the national and European levels, we see LAQM as having provided innovative solutions to local communities. However, this process needs help through central support, to determine what works well. Based on evidence of effectiveness, a framework of air quality actions should be established by Defra for local authorities to adopt. The emphasis on each LA would be on the tailoring of such measures to local circumstances. Examples of this approach adopted outside of England include:

- The German programme for low emissions zones (LEZ) whereby vehicle emissions classifications are nationally agreed, and individual local authorities can design their own LEZ according to their own air quality problems.

- In Australia, the New South Wales Environment Protection Authority (EPA, 2012) has developed air quality management measures to tackle wood burning that each individual LA can then adopt.

- In Scotland, a national low emissions strategy is being developed involving central and local government agencies and local government.

Projects such as the GLA's Cleaner Air for Schools initiative, South Yorkshire's Eco Stars Fleet recognition scheme and the Low Emissions Strategies are examples of the innovation that exists at the a local level and points the way for possible Defra-led national frameworks and resources.

A central database of local actions could be set up for local authorities to record and report their actions. This would further simplify EU reporting. Most importantly, a centrally supported framework would make substantial cost savings. It would reduce business cost by ensuring a consistent basis for approaches across all local authorities; consistent definitions of bus low emissions zones for example. A centrally supported framework would also reduce LA costs involved in the implementation and reporting of local actions.

Please contact us if you would like further details on this evidence.

Yours sincerely

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