

Environmental Targets Team
Defra
Nobel House
17 Smith Square
London
SW1P 3JR

27 July 2022

Dear Sir/Madam,

I write on behalf of the Institute of Air Quality Management (IAQM) to submit our response to your consultation on Environmental Targets and specifically the target proposed for PM_{2.5}. The IAQM does not have the expertise or authority to offer comment on the other targets, so we have chosen not to submit our response on line but by letter instead. The remainder of this letter constitutes our formal response.

The Institute for Air Quality Management is the membership organisation for ambient and indoor air quality professionals. It has over 625 members and was founded 20 years ago when air quality management responsibilities started in the UK. Membership of the organisation signals that one is an expert in the field of air pollution.

The IAQM is the professional body representing people working in the area of air quality management. Membership grade is based on professional experience. Most professional members work in environmental consultancies and so air quality targets are critical to their assessments. The IAQM has consulted its membership on the proposals put forward by Defra.

45. Do you agree or disagree with the level of ambition proposed for a PM_{2.5} concentration target?

Disagree

46. [If disagree] What reasons can you provide for why the government should consider a different level of ambition? Please provide reasons why the government should consider a different level of ambition.

The annual mean PM_{2.5} target proposed by Defra is based on model estimates of future PM_{2.5} concentrations for a set of scenarios, assuming a range of trends in the reduction of primary emissions. Such projections inevitably involve some uncertainty, but it appears that Defra has taken a very cautious approach to the target, since the projections show that nearly everywhere will meet the WHO guideline of 10 µg/m³ well before 2040. By setting a date a long way ahead, and taking this cautious approach on emissions, the target is easily met. Hence, the target is hardly a target at all. The IAQM would advocate the 10 µg/m³

annual mean target being set for 2030 instead, with additional effort on primary emission controls being expended in those few locations where it will not be met under the current projections. Additional effort should also be made in reducing secondary PM_{2.5} across the country.

The interpretation of the annual mean concentration target is not clear. Should it be considered to be merely a guideline like that of the WHO, which has reduced its recommendation for the equivalent to 5 µg/m³? Without this clarity on enforcement, there is likely to be much criticism of the proposed target. We note also that the WHO has also proposed a short-term target for daily PM_{2.5} concentrations, allowing for some exceedances in any year.

47. Do you agree or disagree with the level of ambition proposed for a population exposure reduction target?

The IAQM disagrees with the target date of 2040 for a 35% reduction in the average concentration for a population. We believe that there is scope to achieve this target by an earlier date, given sufficient willingness to implement control measures on both primary and secondary sources of PM_{2.5}.

48. [If disagree] What reasons can you provide for why the government should consider a different level of ambition?

The concept of population exposure reduction is a valid one and the IAQM supports its adoption as part of the strategy to improve concentrations of PM_{2.5}. It is needed, in part, because of the strong gradient of background PM_{2.5} concentrations across the UK and the need to effect improvements everywhere and thereby achieve health benefits across the country. Our reservation on the target set out in the proposal relates to the date by which it can reasonably be achieved. The IAQM believes that 2035 could be a more meaningful date for this target. At the very least, there should be some measure of interim progress set out in the proposal.

The proposals put forward by Defra on the population exposure reduction target entails a significant shift in the way that PM_{2.5} is measured and assessed. As with the annual mean concentration target, the emphasis in future will be on measurement and not modelling. This new architecture will require an expansion in the monitoring network and will doubtless lead to some contention regarding the density of this network and the measurement locations selected. The ability to measure the population exposure accurately will influence the perception of whether the target is genuinely achieved. The evidence report and the proposals lack definition on what are “representative” monitoring sites and what is the likely accuracy of exposure estimates. These aspects will need to be improved before the target can be set in legislation.

The following additional remarks apply to both the AMCT and the PERT and the evidence used to justify these.

It is not clear what happens if the targets are not met or if just one of the two targets is met? Will the Office for Environmental Protection be monitoring the expected downward trend in $PM_{2.5}$ concentration and human exposure as years go by, checking on concentrations, estimated exposure and calculated emission reductions? This activity should be undertaken in parallel with judging whether the UK is following a greenhouse gas pathway to net zero by 2050.

Having a metric for $PM_{2.5}$ as the sole target for air quality is questionable. It keeps assessment of progress simple, but the IAQM believes that it should not be the sole focus of policies to improve air quality. Concern remains over NO_2 for at least the next decade

Evidence reports were promised, but produced belatedly after the start of the consultation. There are two relating to air quality.

The Air Quality $PM_{2.5}$ Targets Detailed Evidence Report Date (6 May 2022) contains numerous references to the UKIAM modelling of Imperial College London. It is referred to on pages 70, 71, 74, 75, 77, 78 and page 124. There are also results of the UKIAM model on page 81 (Fig 16), page 86 (Fig 19), page 87 (Fig 20) and page 88 (Fig 21). There is, however, no reference to any report by the team running this model.

The 'Environment Act Targets Impact Analysis: Air Quality' report also refers to results in Fig 6 (which is Fig 19 of the evidence report), Fig 7 which contains some of Fig 20 of the evidence report, Fig A3 (which approximates to Figs 16 and Fig 19 of the evidence report). It also contains Fig A4 with a 2040 calculation. These figures are referenced as Imperial College London runs of the UKIAM model in this report with dates on when the runs were performed.

The IAQM presumes that the model results presented, which are key to the target setting, were produced as part of a contract undertaken by Imperial College for Defra. For a contract such as this, a published report would be expected, but no such report has appeared in the public domain.

Without access to a full report, it is not possible to understand fully how the projections have accounted for all the complexities of modelling $PM_{2.5}$ concentrations. The secondary component of $PM_{2.5}$ will be uncertain, especially when a model is used to estimate future levels under emission conditions which have not arisen before. Given the large reductions in NO_x emissions which will follow the path to net zero, a change would be expected in the future atmospheric chemistry regime, which contains more alkaline emissions than acid emissions. The formation of secondary aerosol could be therefore very different from that modelled by the UKIAM model.



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The projections show improvements, with the only failures to comply with a target of $10 \mu\text{g}/\text{m}^3$ by 2030 arising in London and here the failures appear to be by at most 1 or $2 \mu\text{g}/\text{m}^3$. Hence the accuracy of the estimate is vital. It is also vital to know the local contribution from primary $\text{PM}_{2.5}$ sources, which could always cause high local exposure (but should be controlled within local air quality management). These questions, and other aspects of source attribution, can only be examined and discussed fully following the publication of the underlying evidence report.

Sincerely yours,,

A handwritten signature in black ink, appearing to read 'R Barrowcliffe', is written over a light grey horizontal line.

Roger Barrowcliffe
Vice Chair,
IAQM