

Meeting EU limit values

Helen Ainsworth/Tim Williamson

The EU legal framework determines the UK air quality assessment

- ▶ All Member States must undertake air quality assessment and report annually to the European Commission
- ▶ The Directives:
 - ▷ Council Directive on Ambient Air Quality and Cleaner Air for Europe (2008/50/EC). This Directive consolidates the first three Daughter Directives and covers NO₂, PM₁₀, PM_{2.5}, SO₂, CO, Pb, O₃ and Benzene.
 - ▷ The 4th Daughter Directive (2004/107/EC) which remains in force. This covers PAHs, Cd, As, Ni and Hg.
- ▶ The UK has statutory monitoring networks in place to meet the requirements of these Directives, with air quality modelling used to supplement the monitored data.

But there is more to do:

- ▶ the annual limit value for NO₂ is exceeded in 40 zones and the hourly limit value exceeded in 3 zones
- ▶ Long term objectives for ozone are exceeded in most zones
- ▶ Target values for Nickel and benzo[a]pyrene are exceeded in a small number of zones
- ▶ National exposure reduction target for PM_{2.5} is challenging

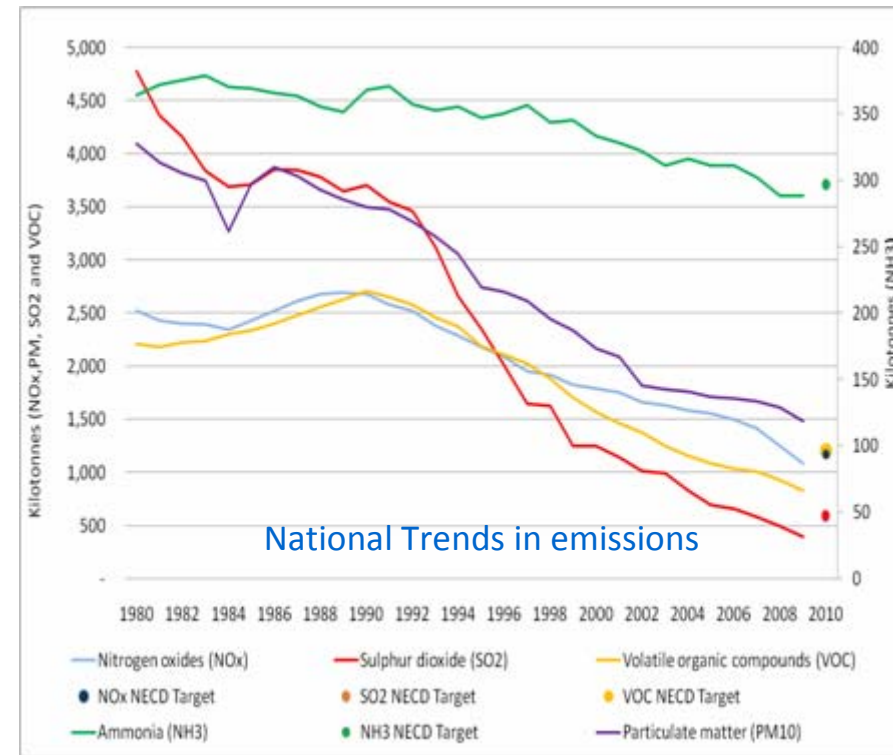
Comparisons with other countries are complicated by assessment approaches

- ▶ 19 Member States are being infringed for non-compliance with PM₁₀ limits
- ▶ 22 Member States reported exceedences of the annual NO₂ limit value in 2008
- ▶ Where the NO₂ limit value could not be met by 2010 air quality plans have been prepared and submitted to the Commission
- ▶ UK has submitted air quality plans for 40 zones setting out actions being taken to meet the limit values

Progress towards the LVs is determined by availability of effective measures

Atmosphere and Local Environment

- Concentrations of nitrogen dioxide (NO_2) have not followed emissions trends, leaving roadside 'hot spots' as EU diesel vehicle engine standards have underperformed, particularly in urban driving conditions.
- Concentrations particulate matter (PM) and ozone, are particularly influenced by weather conditions.
- Ozone is influenced by hemispheric emissions; background levels are rising.



EU air quality legislation is being reviewed



Atmosphere and Local Environment

- The Commission aims to publish proposals by 2013 to revise the ambient air quality and national emission ceilings directives;
- The UK's response to the Commission's initial consultation included the following high level aims:
 - It is important that the Review explores **further scope for reducing negative health and environmental impacts of air pollution** in the context of sustainable development, taking account of the costs and feasibility of additional actions.
 - We think the time is right to **look again at the interpretation of health evidence for NO₂ into the legal framework** and the approach to controlling this pollutant, taking into account other international standards and frameworks.
 - We believe that **opportunities for simplification** and reduction of cost and administrative burdens need to be investigated.

What could simplification mean?

- ▶ The air quality regime is complex, technocratic and difficult to understand.
- ▶ This could be simplified by:
 - ▷ only having targets where action is needed
 - ▷ minimising the number of targets per pollutant: only one?
 - ▷ review the zonal approach for reporting – it doesn't reflect the extent of the problem nor actions to reduce it
 - ▷ Reducing the complexity of the reporting framework
- ▶ Compliance deadlines have brought into sharp focus the implications of variations in the assessment regime
- ▶ Uncertainties around exposure reduction for PM_{2.5}

Can we assess the NERT?

- ▶ Member States required to assess and reduce population exposure to PM_{2.5} by 2020.
- ▶ Magnitude of the required reduction depends on the value of an Average Exposure Indicator (AEI).
 - ▷ PM_{2.5} measurements in urban background locations
 - ▷ Assessed as a three year running annual mean concentration.

Exposure Reduction Target	
Initial Concentration in µg/m ³	Reduction Target %
< 8.5, = 8.5	0 %
>8.5, < 13	10 %
=13, < 18	15 %
=18, < 22	20 %
> 22	All appropriate actions to achieve 18 µg/m ³

The uncertainty can be calculated...

- ▶ The UK has undertaken an GUM* based assessment of the factors that are likely to make a contribution to the uncertainty of measurement of PM_{2.5} AEI now and in 2020, including:
 - ▷ Analyser measurement uncertainty
 - ▷ Combining analyser uncertainties into AEI
 - ▷ Effect of meteorology on measured concentrations
 - ▷ Effect of analyser maintenance
 - ▷ Effect of analyser replacement
 - ▷ Relationship between automatic and manual methods
 - ▷ Changes to Reference Method
 - ▷ Relocation of monitoring stations

*Guide to the Expression of Uncertainty in Measurement, <http://www.iso.org/sites/JCGM/GUM-JCGM100.htm>

...and is larger than the NERT

▶ **Uncertainty in the AEI over 3 years:**

- ▷ Measurement of the AEI for the period 2009-2011 is likely to yield a result with an uncertainty in the order of $\pm 0.2 \mu\text{g}/\text{m}^3$.

▶ **Uncertainty in calculating the achievement of the NERT over ten years:**

- ▷ Depending on changes in conditions between now and 2020, the scale of this expanded uncertainty could be between ± 2.5 and $8.6 \mu\text{g}/\text{m}^3$.

- ▶ This would not produce data with a low enough uncertainty to robustly assess a reduction of **$2.0 \mu\text{g}/\text{m}^3$** in $\text{PM}_{2.5}$ concentrations between 2010 and 2020.

Is there another way to represent population exposure?

- ▶ Assessment framework is complex and legally driven but open to interpretation: international comparisons are difficult
- ▶ Progress towards compliance is determined by available measures: there is a lack of real “game changers”
- ▶ 2013 review needs to maintain credibility: long term aspirations need to be reality checked
- ▶ The regime needs to be simplified if key messages around air quality are to be understood by non-experts
- ▶ Exposure reduction is still the right philosophy but many practical issues exist

THANK YOU!

Helen.ainsworth@defra.gsi.gov.uk

Tim.williamson@defra.gsi.gov.uk