

Details of changes to the 2009 emissions inventory methodology

The 2009 emissions inventory compilation includes two significant methodological changes which have resulted in large reductions in annual emissions of nitrogen oxides (NO_x) and sulphur dioxide (SO₂).

Although changes in inventory methodology are common and indeed are encouraged by inventory guidelines to ensure the use of best practice and the most up-to-date information, the combined scale of these changes is unusual.

The most significant changes to the inventory result from i) an amendment to the way shipping emissions are split between domestic and international and ii) an update to the methods used to calculate NO_x emissions from domestic boilers.

1. Changes to the domestic/international split for shipping

A new methodology to estimate the proportion of total shipping emissions attributed between domestic and international shipping has been implemented. This split is important because international shipping is reported as a memo item and does not count towards the UK's national total. Previously, emissions were split into domestic and international using a number of factors, such as the re-fuelling location and the fuel specification. These factors have led to an erratic time series.

In 2008 Defra commissioned a study to develop a detailed atmospheric emissions inventory from ship movements within waters surrounding the UK, this work provides an improved estimate for domestic shipping emissions. This 'bottom-up' methodology reports lower emissions than the current methodology and will provide a more accurate domestic shipping emission dataset with a clearer trend line for policy development.

For 2008, the methodology change has led to a reduction of 88 kt NO_x and 40 kt SO₂, which is 6% of the national total emissions for both pollutants. Inventory and transport stakeholders have been consulted on the methodology change. The report detailing the revised methodology has been peer reviewed and is publicly available¹.

¹ http://www.airquality.co.uk/reports/cat15/1012131459_21897_Final_Report_291110.pdf

2. An update to the methods used to calculate NO_x emissions from domestic boilers.

The approach used previously for NO_x emissions from domestic gas boilers used an internationally agreed emission factor from the UNECE Guidebook²; 70 g/GJ. A study for the European Commission to underlie the development of measures under the Energy Using Products Directive has generated reports^{3 4} that review the performance of currently marketed gas appliances and estimated the typical emissions from the current fleet. This study suggests previous estimates of NO_x emissions from domestic boilers were significantly too high.

We have been advised that the emissions performance of boilers installed from 1990 would be similar to the current population average from the EC study; 24 g/GJ. Further, that on average new appliances installed from 2005 meet the tightest of the classes in the current European Standard for gas boilers. This has led to a significant reduction in the estimate of emissions from this sector; from 91 kt to 31 kt in the 2008 estimates which has the effect of reducing NO_x emissions from the domestic sector by 59% and the national total NO_x emission in 2008 by 4.3%.

The reports produced for the European Commission were extensively reviewed by industry and other interested parties as part of the workshop process by which they were written. The revised methodology for the UK inventory will be published in the Inventory Improvement Report in March 2011.

² <http://www.eea.europa.eu/publications/emep-eea-emission-inventory-guidebook-2009/part-b-sectoral-guidance-chapters/1-energy/1-a-combustion/1-a-4-small-combustion-tfeip-endorsed-draft.pdf>

³ http://ec.europa.eu/energy/efficiency/studies/doc/ecodesign/2005_11_28_methodology_report.pdf

⁴ http://www.ecoboiler.org/public/ecoboiler_task1_final.pdf