1 June 2013

Update on trends in air quality in London and comparison with other European cities in 2011

Summary

This report analyses air quality monitoring data for 2011 that was collected by the European Environment Agency (EEA) [Note 1]. In 2011 the EEA reported on data for nitrogen dioxide (NO_2) at 2,836 sites (compared with 2,798 in 2010) and for particulate matter (PM_{10}) at 2,625 sites (2,651 in 2010). This report updates a report by Clean Air in London (CAL) on 2010 data titled 'Highest NO_2 in Europe' [Note 2] that was published on 26 April 2012.

In 2011 the Marylebone Road site in London ranked third worst amongst the sites reported to the EEA compared with fourth worst in 2010. London remained the capital city with the highest annual mean concentrations of NO_2. Paris reported three sites among the 20 worst compared to one in London. However, this is due to the UK Government not reporting data from some of the worst sites in London to the EEA.

The fact that 386 (13.6%) of the sites exceeded the EU annual mean limit value of 40 $\mu g/m^3$ is a serious concern given the increasing evidence [Note 3] that NO_2 is linked to serious health effects in it is own right as well as being strongly correlated with other toxic gases. Unlike particles, which are regulated by their overall mass concentration, NO_2 is the only 'modern' 'molecule' regulated within the gas component of air pollution.

In the case of PM_{10} Marylebone Road plummeted in the rankings from 687th worst to 341st worst (i.e. a fall of 346 places), after achieving no significant reduction in measured annual mean concentrations while other cities succeeded in reducing air pollution.

Nitrogen dioxide

Figure 1 illustrates the 2011 data, the most recent available, as aggregated by the EEA, for the 20 sites with the highest reported annual average concentrations of NO_2.

Compared to 2010, as reported in 'Highest NO_2 in Europe', there are both similarities and differences. The most obvious similarity is that there has been little, if any, improvement in concentrations between 2010 and 2011. One difference is that some sites that figured in the 2010 data do not feature in the 'Top 20' worst in 2011 e.g. the Glasgow and Camden Kerbside sites, which had been ranked 11th and 14th respectively, 'improved' to 23rd and 25th worst respectively. There are some "new entrants" such as Krakow, Aosta and Milan. Also, although it appears that one or two of the sites featuring in 2010 were not reported in 2011, none of the new sites reporting for the first time in 2011 feature in the "worst" 20.

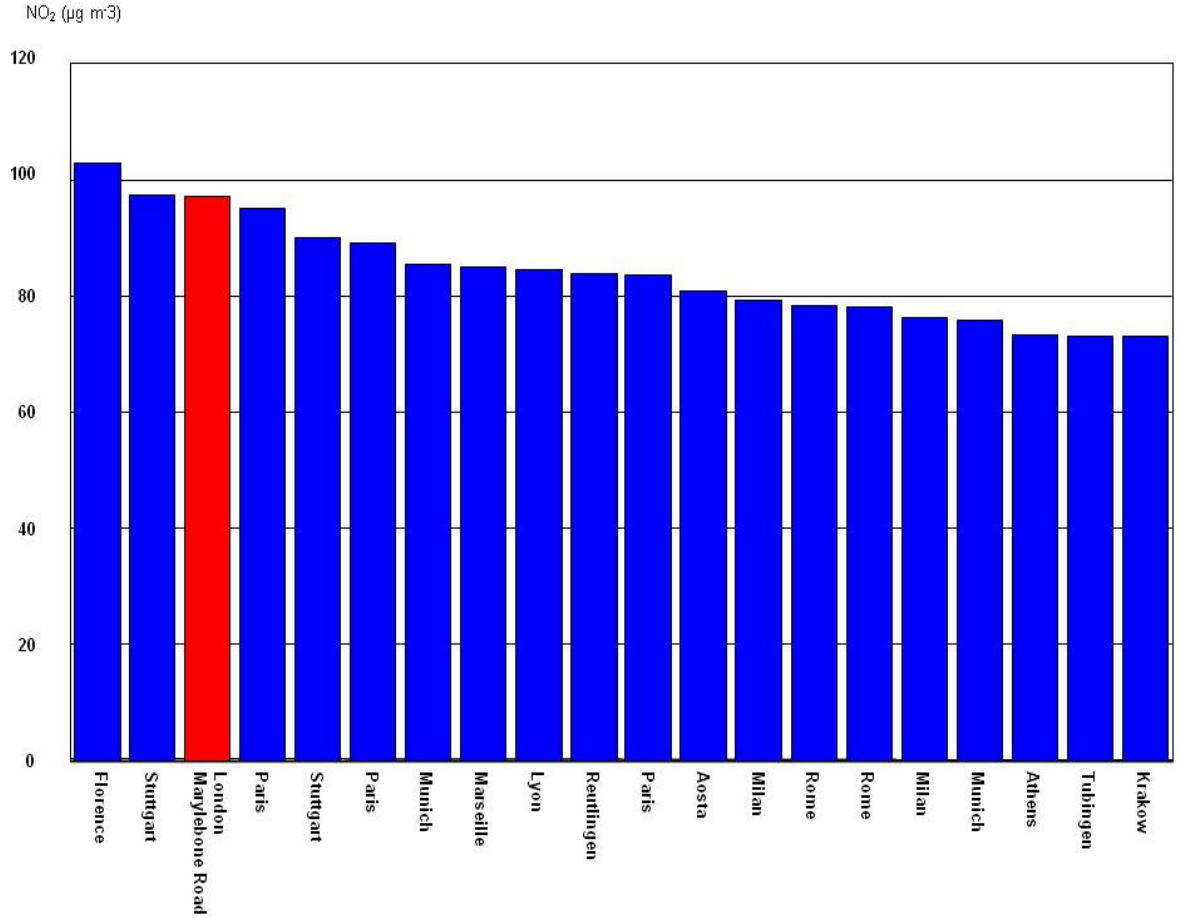

Figure 1 Annual mean concentrations of NO_2 at the 20 "worst" sites in Europe in 2011 (as reported by the EEA).

There is no evidence of any significant improvement in air quality. It is important to recognise that even though Marylebone Road ranks as the third worst site amongst those reported by the EEA in 2011 there are sites within the London Air Quality Network (LAQN) where annual mean concentrations of NO_2 in 2011 were even higher. These include Wandsworth (Putney High Street) (154 $\mu g/m^3$) and City of London (Walbrook Wharf). Data from these sites, however, are not reported to the EU and so do not appear in the EEA reports in spite of the LAQN data ratification procedures being comparable with those for the sites that are reported. Many other towns and cities in the UK also experience high levels of NO_2.

PM_{10} and $PM_{2.5}$

As in 2010, Marylebone Road in London was the site reported by the Government to the EEA as recording the highest concentrations of PM_{10} in the UK (although one site in Gibraltar reported as a GB site was actually slightly higher). It ranked 341th worst of 2,625 in 2011 (compared to 687th worst in 2010) against other European sites. The 89 worst sites were all in Eastern Europe (including

Turkey) and these, with some Italian sites and a few French sites, dominate the list up to the 281th worst.

Although the annual mean concentrations of PM_{10} at Marylebone Road were almost identical in 2010 (38.2 µg/m^3) and 2011 (38.4 µg/m^3) it plummeted 346 places in the "rankings" as many other cities succeeded in reducing air pollution.

In a similar fashion Marylebone Road was the worst reported UK site for $PM_{2.5}$ in 2011 ranking 127th worst of 894 reporting sites. Again Eastern European and Italian sites dominated the "rankings".

Notes

1. 'Highest NO_2 in Europe', Clean Air in London's report on the EEA's 2010 data which was published on 26 April 2012

   http://cleanairinlondon.org/hot-topics/highest-no2-in-europe/

2. European Environment Agency

   http://www.eea.europa.eu/data-and-maps/figures/airbase-exchange-of-information-4/airbase_station_component_availability_2011/at_download/file

3. Proceedings of the 2012 Annual UK Review Meeting on Outdoor and Indoor Air Pollution Research, 3-4 May 2012.

   http://www.cranfield.ac.uk/health/researchareas/environmenthealth/ieh/air_pollution_meeting_2012.pdf)

   Maynard, Environmental Scientist, Vol. 22, 2, ISSN 0966 8411, IES, April 2013.

4. London Air Quality Network statistics

   http://www.londonair.org.uk/london/asp/publicstats.asp?region=0&site=&la_id=&network=All&postcode=&MapType=Google&VenueCode=&zoom=9&lat=51.431751825946115&lon=-0.17578125&laEdge=