

New study 'fingerprints' emissions from UK municipal waste incinerators

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The National Physical Laboratory (NPL) has contributed to a new study, which 'fingerprints' emissions from UK municipal waste incinerators (MWIs) to assess their impact on air pollution levels.

The use of MWIs to dispose of materials such as plastic, glass and food waste is increasing in the UK due to EU restrictions on the use of landfill. The European Industrial Emissions Directive, which aims to protect the environment and human health, imposes strict limits on emissions of [heavy metals](#) and other pollutants from MWIs. However, the impact of MWI emissions on [ambient air](#) pollution is unclear.

In the new study, published in the journal *Atmospheric Environment*, researchers from institutes including King's College London, Imperial College London and NPL analysed stack emissions data from MWIs around the UK. Measurements of the concentrations of nine different heavy metals were analysed over the

period from 2003 to 2010. Pairs of metals which showed a strong correlation were taken as tracers of MWI emissions. The ratios of these metals (copper/lead, cadmium/lead, cadmium/copper and chromium/lead) can then be used to fingerprint emissions from MWIs, acting as markers which distinguish MWI emissions from other sources.

To investigate the impact on ambient air pollution, the same metal ratios were calculated for ambient air samples taken at six sites within 10 kilometres of an MWI. The analysis found no evidence of incinerator emissions at sampling sites within the vicinity of four of the MWIs. For the two MWIs from which emissions were identified, ambient concentrations of PM10 (particles of less than 10 micrometres in diameter, which are linked to detrimental health effects) were found to be very low compared to background rates. Consequently, the researchers concluded that the six UK MWIs studied contributed little to ambient PM10 concentrations.

NPL contributed measurements of the ambient concentrations of metals at sites in the UK Urban and Industrial Heavy Metals Air Quality Network (which NPL operates on behalf of Defra) providing the quality-assured monitoring and analysis needed to help this study reach its conclusions.

The study is part of a bigger Public Health England project investigating birth outcomes in the population living around MWIs in England, Wales and Scotland. The full report will be published in the near future.

More information: "Using metal ratios to detect emissions from municipal waste incinerators in ambient air pollution data," *Atmospheric Environment*, Volume 113, July 2015, Pages 177-186, ISSN 1352-2310, [DOI: 10.1016/j.atmosenv.2015.05.002](#)

Provided by National Physical Laboratory

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