science summary

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The use of substitute fuels in the UK cement and lime industries

Science Summary SC030168/SS

Using substitute fuels made from waste materials can reduce emissions of pollutants and greenhouse gases from cement and lime plants, according to a new report published by the Environment Agency.

The review, carried out by Atkins, looked at the use of substitute fuel (SF) in the UK cement and lime industries, including the different types of fuel used and their environmental impact. Substitute fuels include recovered fuel oil, recycled liquid fuel, old tyres, refuse-derived fuel and biofuels such as meat and bone meal and processed sewage pellets.

In the UK, 13 cement plants have trialled or are using SFs. Two lime plants are also using substitute fuels.

The report found that the substitution rate for SFs replacing conventional fuels (such as coal and petroleum coke) in the UK (14 per cent in 2005) was below the average for Europe (17 per cent in 2004). Accordingly there appears to be significant scope for increasing the use of SFs in this sector.

Environment Agency compliance records showed that there were no Category 1 incidents (non-compliance that caused or had the potential to cause major harm) and only one Category 2 incident (non-compliance that caused or had the potential to cause significant localised environmental harm) relating to cement works in 2005. This latter incident was not related to the use of SFs.

The report also discussed comments from the general public and professionals who were consulted on applications from cement kilns to use SF. The majority of comments could be divided into the following themes: environmental impacts; public health concerns; possible odour nuisance; effects on the food chain; and safety issues.

Environmental studies of the use of SFs were reviewed, including ambient monitoring of nitrogen oxides (NO_x) and sulphur dioxide (SO_2), and public health concerns over air quality, odour nuisance, possible effects on the food chain and safety issues.

The study analysed the effects of burning SFs in cement and lime kilns, including the effects on cement-making operations. The analysis showed that the burning of SFs can help reduce the total impact of air emissions from these kilns.

All cement and lime kilns that use substitute fuels, designated as wastes, must comply with the Waste Incineration Directive (WID). WID places additional monitoring requirements and strict emission limits on a range of pollutants. The use of SFs under WID requirements has helped reduce emissions of some pollutants at many installations.

The assessment of impacts considered air quality, health risks, odour, greenhouse gases (GHGs), energy efficiency and waste from SF burning in cement kilns. The report found that long-term and short-term pollutant concentrations from cement kilns were small fractions of air quality strategy (AQS) limits, irrespective of whether conventional fuels or SFs were burnt. Odour has so far not been an issue for SF use. The use of biofuels (meat and bone meal, processed sewage pellets and refuse-derived fuel) has reduced fossil fuel CO_2 emissions. Generally, the use of SFs did not produce more waste.

Health impact assessments and other studies were reviewed to establish any health risks. Under normal operation, the review found that there would be a negligible risk to human health from the use of any SF.

This summary relates to information from Science Project SC030168, reported in detail in the following output:

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