

Science for Environment Policy

Waste's environmental impacts measured with new method, but better data needed

Life-cycle indicators to monitor selected waste streams' impacts on the environment have been developed by the European Commission's Joint Research Centre (JRC). These are presented in a recent study which describes a method for analysing waste's impacts using these indicators. The study also reveals the need for better statistics and more detailed categorisation of waste streams to effectively inform decision making in waste management.

The EU-27 generates nearly 300 million tonnes of [waste](#) every year and the expanding number of different waste streams has made management an increasingly complex process. New approaches are needed to provide a scientific evidence-base for decisions on how best to deal with waste. In particular, a systematic and quantitative evaluation of the environmental impact (both positive and negative) of various waste management systems is required.

The Institute for Environment and Sustainability of the JRC is promoting the use of macro-level indicators to quantify and monitor the environmental impacts of selected waste streams. The developed set of indicators covers a broad range of environmental aspects, such as impact on [climate change](#), [land use](#), [human health](#), eutrophication and resource use. This study reports on the process used by an EU-funded pilot project¹ to conduct a life-cycle analysis (LCA) on waste management using environmental impact indicators developed by the JRC. Waste management was assessed for the EU-27 as a whole and a single Member State, Germany, which was chosen because of expected good data availability.

The analysis focused on 12 relevant waste streams from the 48 waste categories provided by the Waste Statistics Regulation². There were insufficient data to calculate indicators for five streams for the EU-27 and three streams for Germany. Notably, discarded electrical and electronic equipment did not have sufficient data at either the EU or German level.

Using the available data, the LCA consisted of two obligatory tests: classification and characterisation, and two optional steps: normalisation and weighting.

Classification and characterisation involves calculating the impact of the management of waste streams using the chosen indicators, for example, impact on climate change, impact on ozone levels or impact on eutrophication.

Normalisation and weighting. Normalisation allows indicators to be compared in terms of impacts per person or per area. The weighting step is optional, and involves allocating a relative weighting to the different environmental impacts according to their importance, so they can be combined into one overall environmental impact score.

The LCA allows the impacts of different waste streams and different management steps, such as collection, landfill and recycling, to be evaluated. For example, at the EU-level, climate change and freshwater eutrophication impacts were the most significant of the impacts associated with household and similar waste. These impacts were mainly caused by emissions of methane and CO₂ from landfills and waste incineration plants.

The study highlights a number of limitations in current waste statistics. For example, there are not enough data for some waste streams and treatments. Furthermore, to provide a more complete picture, additional waste streams, such as used oils and batteries, also need to be considered.



27 February 2014
Issue 363

**Subscribe to free
weekly News Alert**

Source: Manfredi, S. & Goralczyk, M. (2013). Life cycle indicators for monitoring the environmental performance of European waste management. *Resources, Conservation and Recycling*. 81:8-16. DOI: 10.1016/j.resconrec.2013.09.004.

Contact:
simone.manfredi@jrc.ec.europa.eu;
malgorzata.goralczyk@jrc.ec.europa.eu

Read more about:
[Waste, Sustainable consumption and production, Environmental information services](#)

The contents and views included in *Science for Environment Policy* are based on independent, peer-reviewed research and do not necessarily reflect the position of the European Commission.

To cite this article/service: "[Science for Environment Policy](#)": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.

1. The life cycle indicators pilot project was funded by the European Commission, DG Joint Research Centre and DG Eurostat.

2. See: <http://rod.eionet.europa.eu/instruments/528>