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1.http://ec.europa.eu/environment/waste/landfill_index.htm

European Commission

Science for Environment Policy

New biodegradable waste management plans proposed and evaluated

Researchers have designed and proposed a new organic waste management plan for Catalonia, Spain, and presented it in a recent study. They say that the plan would reduce a number of environmental impacts that arise from landfilling biodegradable waste, including natural resource depletion, acidification, and eutrophication.

To reduce the negative environmental effects of landfilling and to promote the sustainable management of biodegradable municipal waste, the EU Landfill Directive[1] has set targets for EU Member States to limit the amount of landfilled biodegradable municipal waste to no more than 35% of the amount produced in 1995, by 2020.

For this study, the researchers proposed a new biowaste management plan. They used model simulations to examine the outcomes of using the plan to treat the annual amount of organic municipal solid waste produced in Catalonia in 2012 (1218 gigagrams (Gg)). In particular, they looked at the impact of using anaerobic digestion for recycling biowaste to produce biogas, adding sludge to soil, and various forms of industrial and home composting treatments.

They compared this new plan with those of actual waste management in 2012 in terms of impacts on abiotic (non-living) natural resource depletion, acidification, eutrophication, global warming, ozone layer depletion and summer smog.

The proposed management model meets the requirements of the Landfill Directive, as well as the new Catalan waste management plan (2013–2020). As incineration or disposal to landfill of untreated municipal solid waste is banned, the new plan is designed to cope with the increased volume of organic waste (food and green waste) collected by local authorities.

Under the plan, waste would be preferentially treated in anaerobic digestion plants, as well as in existing composting plants. To reduce ammonia and volatile organic compound (VOC) emissions from composting, biofilters would be installed in composting plants. The organic fraction of the municipal solid waste that has not been collected separately would be composted before being landfilled. Levels of home composting would also increase.

The results show that the new waste management plan would have caused less environmental damage across all impacts considered, compared with the actual 2012 management. The impact on summer smog was the only one to increase (by 23%) under the proposed scheme, mainly because more VOCs are emitted from composting processes than from landfill.

Under the new waste plan, global warming impacts would be reduced by 36%, the model predicts. Eutrophication impact would be cut by 49%, mainly through avoided nitrogen and phosphorus compounds leaching from landfill sites. Abiotic resource depletion would fall by 16%, largely the result of energy recovery from anaerobic digestion, but also through reduced transport to landfill sites. Furthermore, the ozone layer depletion impact would be reduced by 9%.

The researchers also highlight uncertainties related to modelling waste management systems. They found, for example, that if methane emissions escaping from the anaerobic digestion process are not controlled or collected, the climate change impact of this plan could actually increase by up to 31%.

This work can help similar European regions that need to change their biowaste management with the aim of implementing Landfill Directive recommendations in the mid-term future, say the researchers.