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Bio-Waste Recycling in Germany – Further Challenges

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Abstract

German biodegradable waste is collected separately, recycled and ecologically and economically used. Compost and digestate are used as organic fertilizer or replace peat in potting soil and plant substrates. The bio-waste recycling may also directly contribute to climate protection if the methane produced during the fermentation is used for energy production. Around the world biodegradable waste in landfills is the main factor for the generation of the greenhouse gas methane.

This environmental impact can be significantly reduced by the separate collection and recycling/use of organic waste. The separate collection of bio-waste is also a precondition for reutilizing of organic matter and nutrients. Only from separately collected bio-waste it is possible to produce high-quality compost and digestate, which are suitable for agricultural or horticultural use. The separate collection of bio-waste from households affects the amount and composition of the residual waste. By separating bio-waste the remaining amount of waste is reduced up to a third. At the same time the residual waste contains less wet ingredients, which facilitate the waste sorting and makes the treatment in waste incineration plants more effective or even possible.

Both, the recycling of compost and digestate on soils, as well as the energy recovery of bio-waste, contribute to climate protection and resource conservation. The operation of the treatment plants determines how much of the greenhouse gases methane, nitrous oxide and ammonia is released during the process.

Some plant operators need to be awakened and their awareness of climate-relevant emissions from their bio-waste treatment plants has to be raised. Also the amount of collected organic waste should be further reinforced. In 2015 the separate collection of bio-waste has to improve!

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1. Introduction

Germany has implemented a separate collection for waste, household and other kinds of waste, more than twenty years ago. Diverse environmental damages, lack of landfill space and the use of finite resources led in the early 90s to a rethink in waste management. Today, climate change and energy demand are important arguments for the separate collection and utilisation of all kinds of organic wastes. In response to the EU's waste framework directive, the Waste Management Act of 2012 (KrWG) in § 11 paragraph 1 obligates waste producers and mandated waste management authorities to collect bio-waste separately at the latest as of January 1st 2015. The term "bio-waste" in § 3 KrWG comprises yard, park, and landscape management waste as well as food and kitchen waste. The requirement in the Waste Management Act (KrWG) to collect bio-waste separately (§ 11/2 KrWG) is concretised in the Bio-waste Ordinance (BioAbfV).

This article tries to discuss all kind of organic waste but is focused on the bio-waste from private households that is collected by using bio-waste bins. Wastes collected through bio-waste bins, especially food, kitchen and yard waste, are monitored according to the European Waste Catalogue (The European Commission 2014.) laid down in the Commission Decision 94/3/EC and the German waste index regulation (AVV) under the waste classification key 200308 (biodegradable kitchen and canteen waste, with animal residues) (Deutsche Bundesregierung 2001).

The German Bio-waste Ordinance (Ordinance on the Recovery of Bio-waste on Land used for Agricultural, Silvicultural and Horticultural Purposes) (Deutsche Bundesregierung 2013) defined bio-waste in general:

Waste of animal or plant origin or from fungal materials for recovery purposes, which can be degraded by microorganisms, soil-borne organisms or enzymes, including wastes for recovery purposes with high organic content of animal or plant origin or fungal materials (details in Annex 1 Bio-waste Ordinance)

This article will use:

- Bio-waste (collected in bins): separately collected (in bio-waste bins or bags) food and kitchen waste, and yard waste from private households.
- Green waste: Separately collected yard waste from private households, and waste generated in municipal parks and in landscape management (Krause et al. 2014).
- "Organic waste" is used for all kinds of biodegradable wastes.

For the treatment of separate collected bio-waste (composting and digestion) the important laws are given with (BGK 2014):

Bio-waste Ordinance (BioAbfV 1998, revised in 2012): The amended Bio-waste Ordinance (BioAbfV) of 2012 covers the application of treated and untreated bio-wastes and mixtures on land which is used for agricultural, silvicultural and horticultural purposes. It also covers suitable raw materials, quality and hygiene requirements, and treatment and investigations of such bio-wastes and mixtures. The Bio-waste Ordinance regulates – from a precautionary perspective – the waste side (e.g. heavy metals) of the application, whereas the fertiliser law regulates the nutrient part.

Fertiliser Law (DüV 2007): Gives the frame for the good code of practice of fertilising and shows special requirements for organic fertilisers. It includes the restrictions for the application of fertilisers with essential nitrogen contents in winter periods.

Fertiliser Ordinance (DüMV 2012): Compost from biodegradable waste is subject to the fertiliser ordinance as a secondary raw material fertiliser (or seldom as soil improving agent). A declaration of the fertiliser type, raw material, nutrients and other product properties is obligatory. Threshold values for contaminants like PFT, PCCD or dl-PCB, included in the Fertiliser Ordinance are obligatory for compost and digestate, too.

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