ECN Country Report *2017*

Germany

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1 Introduction on bio-waste management in Germany

In Germany the separate collection of biowaste from households and greenwaste from gardens and parks has a long tradition and is one of the main measures in waste management. The separate collection of biowaste is also a basic requirement for the production of high-quality compost or digestate in order to recycle nutrients and organic matter. Biowaste is treated in composting or biogas plants for hygienisation and maturation. At the end of the treatment process compost or digestate is produced. Compost or digestate from organic waste is used as organic fertiliser for agriculture or as soil improver. Furthermore compost can be used as a substitute for peat in horticulture or potting soils. However, the treated biowaste must meet the defined quality requirements and the treatment process must be environmentally safe as possible.

Since the beginning of the separate collection of biowaste from households in the year 1985 the amount of recycled biowaste has steadily increased. According to the latest national statistics by DESTATIS)[1] about 13.5 million tons of biowaste were treated in composting and digestion plants.

2 National concept/strategy on bio-waste management

2.1 Legal framework

Act for Circular Economy (Kreislaufwirtschaftsgesetz - KrWG 2012)[2]
The requirements and the processes of modern waste management are defined in the Act for Circular Economy from 24th February 2012, which came into force in June 2012 and covers the avoidance, use and disposal of waste. The KrWG is implemented via ordinances for different waste material groups, e.g. for biowaste or sewage sludge.
Furthermore the revised Act for Circular Economy (KrWG, 2012, § 11 paragraph 1) obligates all waste producers and mandated waste management authorities to collect biowaste separately at the latest of 1thJanuary 2015. Therefore a further increase in the amount of biowaste and compost and digestate has to be expected in the future.

Biowaste Ordinance (BioAbfV 2012) [3]
The revised Biowaste Ordinance (BioAbfV) of 2012 covers the application of treated and untreated biowaste 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 biowastes and mixtures. The Biowaste 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 2017) [4]
Gives the frame for the good practice of fertilising and shows special requirements for organic fertilisers. It includes the limit of 170 kg N/ha as restriction for the application of organic fertilisers and also an off-time for application of compost or digestate in the winter period.

Fertiliser Ordinance (Düngemittelverordnung DüMV 2012, latest amendment 12.4.2017)[5]
Compost or digestate is subject of the fertiliser ordinance as organic fertiliser or as soil improver. A declaration of the fertiliser type, raw material, nutrients and other product properties is obligatory. Also treshold values for impurities or contaminants are defined in the Fertiliser Ordinance.

Federal Soil Protection Law (BBodSchG 1998/BBodSchV 1999) [6]
Ensures the soil function and gives among others precautionary requirements for the contamination of soils. The soil protection law is relevant for the application of compost for landscaping and recultivation. The Soil Protection Ordinance is actually in revision.

Animal-by Products Regulation ABPR EG (Nr.) 1069/2009 [7]**; Animal-by-products-Disposal Ordinance** (TierNebV 2006, latest amendment from 31.8.2015) [8]
In Germany the Animal-by Products Regulation is implemented by a specific Ordinance, the TierNebV. For kitchen and catering waste (biobin material and commercial kitchen and catering waste) the treatment according to Biowaste Ordinance has to be fulfilled. The materials have to be collected and stored separately.

Renewable Energy Law (EEG 2017) [9]
Promote the technology and the production of renewable energy which support the development of anaerobic digestion of organic waste.

2.2 Waste management programs and strategies

The Act for Circular Economy (KrWG, 2012, § 11 paragraph 1) [2] obligates all waste producers and mandated waste management authorities to collect biowaste separately at the latest of 1thJanuary 2015. Actually the participation in separate collection of biowaste isn´t up to 100 % because not all German municipalities has yet established the separate collection.

2.3 National standards and technical guidelines (collection, treatment and use)

A technical guideline for composting or digestion is given by the VDI Guideline N°. 3475 [10]. The scope of this guideline is the emission control for biological waste treatment facilities. Actually part 6 of this guideline is in development. Also the technical guideline for prevention of air pollution (TA Luft, 2002)[11] is in revision and actually in discussion.

2.4 Quality Assurance Scheme (QAS) and National Quality Assurance Organisation (NQAO)

In the eighties of the last century the German recycling industry started a quality initiative in composting which led to the foundation of the German Compost Quality Assurance Organisation (Bundesgütegemeinschaft Kompost (BGK)) in 1989. BGK is the carrier of the RAL quality labels for compost, digestate and sewage sludge. It is recognised by the RAL, the German Institute for Quality Assurance and Certification, as being the organisation to handle monitoring and controlling of the quality of compost, digestate and products of sewage sludge in Germany.)[12]
In 1991 a quality standard, quality label and the RAL quality monitoring system for compost was established (RAL GZ 251). In the year 2000 an additional quality scheme for digestate was started. With a revision in 2007 the digestate products were divided into two different product groups according to their input materials - the RAL GZ 245 "Gärprodukt" for digestate and the RAL GZ 246 "NawaRo-Gärprodukt" for digestate from renewable energy crops. The RAL GZ 258 for AS Humus (sewage sludge compost) was introduced in 2003 and in 2009 the BGK added a quality scheme for sewage sludge in respect to fertilisation purposes called "AS-Düngung (sewage sludge for fertilisation)" with the RAL GZ 247.

The BGK was founded in order to monitor the quality of compost made by biowaste. Through consistent quality control and support of the compost producers in the marketing and application, the organisation aims to promote composting as a key element of modern recycling management. The BGK works through regional compost quality assurance organisations. These regional organisations are made up of ordinary members - the compost producers - and extraordinary members or promoters, amongst whom are those interested in composting, for example representatives from analytical laboratories, authorities, industry, science and local authorities. In total, there are more 700 members who take part in the different quality assurance schemes by BGK.

Kompost RAL-GZ 251	524	Fertigkompost Frischkompost Substratkompost	
Gärprodukte RAL-GZ 245	127	Gärprodukt fest Gärprodukt flüssig	
NawaRo-Gärprodukt RAL-GZ 246	41	NawaRo-Gärprodukt fest NawaRo-Gärprodukt flüssig	
AS-Humus RAL-GZ 258	9	AS-Fertigkompost AS-Frischkompost	
AS-Düngung RAL-GZ 247	8 54	Verwerter von Abwasserschlamm Kläranlagen	

Figure 1: Product groups, number of participants, product name and quality labels of the German Quality Assurance Organisation (BGK)[13]

Actually 524 compost plants, 168 digestion plants, 9 compost plants for sewage sludge compost and 54 sewage sludge distributer take part in the quality assurance system and have applied for a RAL quality label.

Besides the central office which oversees activities, a quality committee works as the main supervision and expert body in the quality assurance system. It controls the results of analysis and decides upon necessary measures. It is composed of representatives from research, laboratories, producers, compost users and authorities.

General quality standards were defined for compost, for digestate, sewage sludge compost and sewage sludge and a nationwide system for external monitoring of compost or digestion plants and of compost or digestion products was established. The frequency of the investigations during the recognition procedure and the subsequent ongoing monitoring procedure depends on the plant input capacity. At least four inspections should be carried out during the first year of operation – one for every season – to assess the essential quality characteristics over the course of the year. At least one sample should be taken every three months. In the following years, when the plant is working normally, it is possible to reduce the frequency and scale of inspection. [12]

Sampling and investigations must be done by an approved external sample taker and approved laboratory which does the analyses – in line with the procedures laid down by the Quality Committee of the BGK. The Quality Committee of the BGK has issued specifications for high-quality compost and digestate. The quality labels represent these specifications. This allows a standardisation of quality and enhances the product's sales image. The labels awarded by the BGK also mean that there are regular checks by independent bodies to ensure that product quality is maintained after the label has been awarded. The up-to-date quality criteria and directives of the BGK are the basis for the awarding of the RAL quality labels to treatment plants. The RAL quality criteria are valid for the different product types. [12]

The long-standing activities of the BGK for the standardisation, monitoring and declaration of high quality humus products lead to an acknowledgement of these measurements by the law maker as "self obligation of the industry". In addition the law making body implicates that the biowaste which is under continuous

monitoring by and independent organisation is not a product but "likely a product". So members of the Quality Assurance Organisation which render themselves subject to a voluntary quality monitoring are widely exempted from a official control and from proof obligation by regional authorities.

3 Source separated collection of bio-waste

The separate collection of biowaste is a precondition for the recycling of organic substances and nutrients. Only from separately collected biowaste a high-quality compost or digestate can be produced which is suitable for agricultural or horticultural use.
Biowaste includes biowaste from households (biobins) and trade, garden and park waste as well as food waste, waste from food processing and agricultural waste. It should be noted that a large proportion of agricultural residues, such as manure, are not part of this as they are not disposed of as waste. The next figure shows the composition of biowaste supplied to biowaste treatment plants in the year 2014.

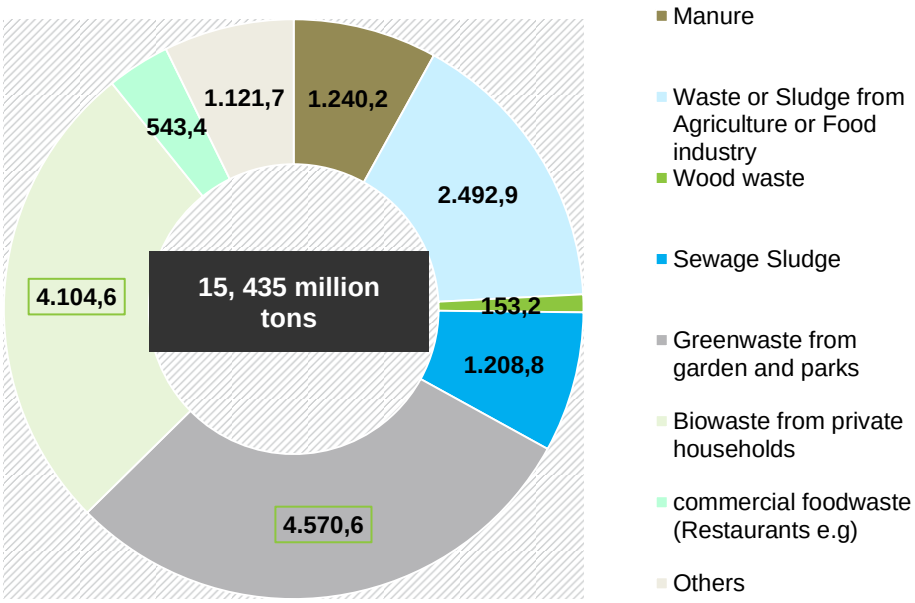


Figure 2: Composition of organic waste supplied to treatment plants (published by UBA [12],data DESTATIS [1])

As output of the biological treatment of this biowaste

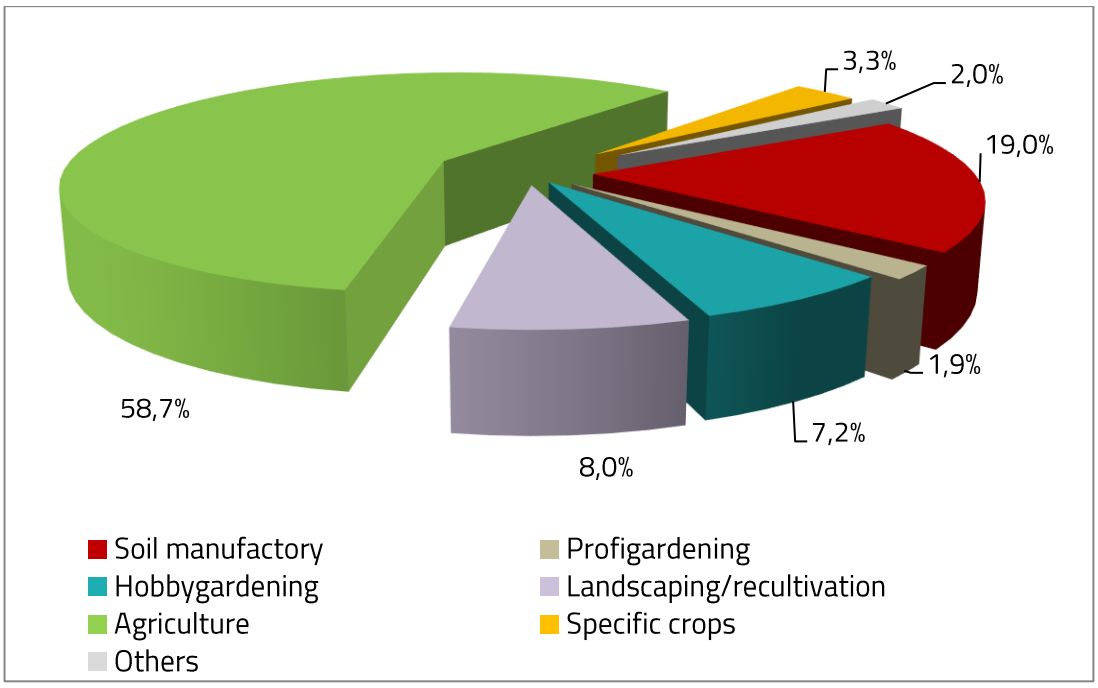
- 1.6 million tonnes of biowaste compost
- 1.8 million tonnes of greenwaste compost
- 4.4 million tonnes digestate and
- 0.3 million tonnes of sewage sludge

were produced in the year 2014. [12]

4 Application and market

Agriculture is the beneficiary of the recycling of biowaste. That was calculated by the annual statistics of the German Quality assurance organisation for compost (BGK)[15]. Almost all digestates and nearly 60% of all composts are provided to agriculture. They are used as organic fertilisers on farming land.
The advantage is the substitution of mineral fertilisers as well as the soil improvement. Not only the nutrient content but also the organic matter of compost and considerable contents of liming materials argue for compost or digestate use in agriculture. To improve soil properties by using the stable organic matter of high quality composts is seen as an appropriate solution for soil degradation. Especially the demand for compost by organic farming is increasing. A lot of compost is also applied in horticulture and in private gardens. Especially the demand for compost as substitute for peat may increase in the next years.

Figure 2: Market distribution of compost with quality label in 2016 (BGK, 2017)[15]



5 Expected trends and developments

The main item for the separate collection of biowaste in Germany is to optimise the quantity and quality of biowaste. According to the legal situation the separate collection of biowaste is expected to increase in Germany in the next years. Especially the recycling of kitchen waste is of note.
Another important issue for the separate collection is the sorting accuracy for biowaste. A wrong filling of biobins cause problems for the treatment later one. Especially impurities like plastics or glass have to be sorted out during the treatment and recyling of biowaste in composting or digestion plants. Therefore, separate collection has to be accompained by active public relations and guidance by municipalites. The sorting accuracy has to be guaranteed and to be controlled. "Clean" biowaste (without impurities) is the basic for the production of good compost.

Because of the revised Fertiliser Regulation with new restrictions for the application of organic fertilisers on farming land the marketing conditions for compost or digestate are expected to become more difficult especially in regions with high animal densitiy.
Also, the quality demand by hobbygardening or horticulture users will increase. Therefore, the compost producer has to fullfill high quality demand for his compost.

6 Contacts and sources of information

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Internet: www.kompost.de

About BGK
BGK is the German quality assurance organisation for compost, digestate and humus products of sewage sludge or sewage sludge.

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[1] **DESTATIS**: Statistisches Bundesamt, Fachserie 19 Umwelt, Reihe 1 Abfallentsorgung 2014, Wiesbaden, August 2016 https://www.destatis.de/DE/Publikationen/Thematisch/UmweltstatistischeErhebungen/Abfallwirtschaft/Abfallentsorgung2190100147004.pdf?__blob=publicationFile
[2] **Act for Circular Economy (Kreislaufwirtschaftsgesetz - KrWG 2012)** https://www.umweltbundesamt.de/sites/default/files/medien/384/bilder/dateien/2_abb_zusammensetzung-bioabfaelle_2016-11-17.pdf
[3] **Biowaste Ordinance (BioAbfV 2012)** http://www.gesetze-im-internet.de/bioabfv/index.html
[4] **Fertiliser Law (DüV 2017)** http://www.gesetze-im-internet.de/d_v/index.html
[5] **Fertiliser Ordinance (Düngemittelverordnung DüMV 2012)** http://www.gesetze-im-internet.de/ d_mv_2012/index.html
[6] **Federal Soil Protection Law (BBodSchG 1998/BBodSchV 1999**) http://www.gesetze-im-internet.de/bbodschg/
[7] **Animal-by Products Regulation ABPR EG (Nr.) 1069/2009** http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:300:0001:0033:DE:PDF
[8] **Animal-by-products-Disposal Ordinance** (TierNebV 2006, latest amendment from 31.8.2015) http://www.gesetze-im-internet.de/tiernebv/index.html
[9] **Renewable Energy Law (EEG 2017)** https://dipbt.bundestag.de/dip21/brd/2016/0355-16.pdf
[10] **VDI Guideline N°. 3475** http://www.beuth.de/de/technische-regel/vdi-3475-blatt-1/59262060
[11] **TA Luft, 2002** http://www.bmub.bund.de/fileadmin/Daten_BMU/Download_PDF/Luft/taluft.pdf
[12] **BGK, Bundesgütegemeinschaft Kompost e.V.** https://www.kompost.de/startseite/
[13] **BGK: Zahlen und Fakten** https://www.kompost.de/ueber-uns/zahlen-und-fakten/
[14] **Umweltbundesamt (UBA), 2016** https://www.umweltbundesamt.de/daten/abfall-kreislaufwirtschaft/entsorgung-verwertung-ausgewaehlter-abfallarten/bioabfaelle#textpart-2
[15] **BGK, 2017: Absatzwege gütegesicherter Komposte 2016** https://www.kompost.de/fileadmin/user_upload/Dateien/Zahlen/Markt_Kompost_2016.pdf