



The biowaste management challenge

A Policy Brief from the Policy Learning Platform on Environment and resource efficiency

December 2021



**Interreg
Europe**



European Union | European Regional Development Fund

Table of Contents

Summary	3
What is biowaste and where does it go at present?	3
European policy as driver for biowaste management	4
Obligatory separate collection of biowaste by December 2023 for all municipalities	4
What treatment of biowaste counts as recycling in line with the EU Directives?	4
Policy solutions for improved biowaste management	7
Separate collection of biowaste	7
Home and community composting schemes	8
Recycling biowaste into biogas and fertiliser	11
Recommendations and key learnings	13
European support for separate collection and recycling of biowaste	14
EU Financial Support	14
The Interreg Europe Policy Learning Platform supporting regions and municipalities in meeting the biowaste challenge	15
Interreg Europe Policy Learning Platform information	15
Other sources	15

Summary

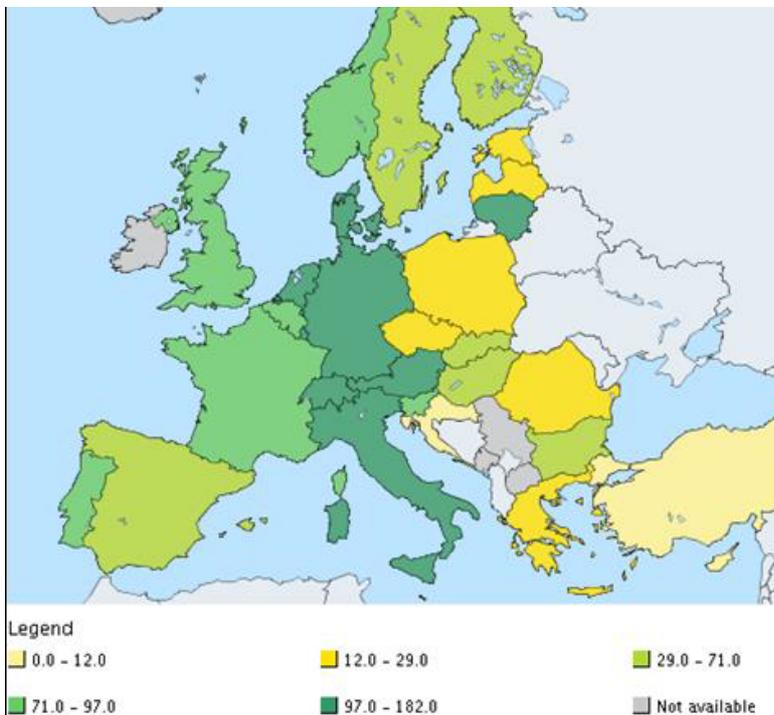
Biowaste management is likely to attract a lot of public attention and funding in the coming decade. The “owners” of the feedstock are typically municipalities who own the waste generated on their territory, and along with it the obligation to manage it. In 2018, the revised Waste Framework Directive introduced stricter rules to guarantee the separate collection of waste streams including biowaste (from 31 December 2023 on). At the same time, it called for the diversion of biodegradable waste from landfill and incineration and for the increase of the overall recycling targets to 65% by 2035.

The present policy brief therefore provides an outlook on EU initiatives that local and regional authorities should refer to for boosting their biowaste collection, prevention and recycling rates in compliance with the EU Directives and to the benefit of a local circular economy. It also presents a selection of Interreg Europe good practices and EU-funded projects of particular interest and featured with a high degree of replicability and adaptability to other municipal contexts.

What is biowaste and where does it go at present?

The definition of bio-waste is given in Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste (Article 1(3)(b)). This states that biowaste comprises **biodegradable garden and park waste, food and kitchen waste from households, offices, restaurants, wholesale, canteens, caterers and retail premises and comparable waste from food processing plants**. It helps to think of two major fractions, namely garden & park waste and food & kitchen waste.

Across the EU, between 118 and 138 million tonnes of bio-waste are generated annually, of which more than two thirds comes from municipal bio-waste, the remainder coming from the food and drink industry¹. Bio-waste constitutes 30-40% of municipal solid waste (with variations between Member States from 18% up to 60%).



Recycling of biowaste in Europe (2017)
in kg of biowaste per capita,
taken from [Guidance for separate collection of municipal waste](#)

Countries such as Austria, Switzerland, Germany, the Netherlands, Flanders (Belgium), Sweden and Norway have more than 15 years' of experience with separate bio-waste collection and treatment systems, whilst the UK, Italy, Finland, Ireland, Slovenia, Estonia and France have made significant advances over recent years.

Nonetheless, the majority of the biowaste that Europe generates each year is still lost through landfilling and incineration thus wasting the great potential of recycling this organic material as compost or animal feed and for anaerobic digestion.

The reason for this is that biowaste from households mostly ends up in the residual waste bins. For example, the [greater Porto area](#)

¹ EC [Guidance for separate collection of municipal waste](#)

measures that the biowaste in its residual waste amounts to 37%. The challenge is to reduce the biowaste in the residual waste as much as possible. This can be achieved by avoiding that it ends up in the waste treatment system altogether, through actions to “reduce” food waste, to “re-use” food waste as animal feed, or to “recycle” biowaste at home composting units. But upstream avoidance is not the scope of the present policy brief. We will focus instead on measures to divert biowaste that *is* thrown away from ending up in the residual waste bins and the subsequent management of this organic waste stream.

European policy as driver for biowaste management

It is the European policy with binding targets and timelines that drives the transformation of the waste sector towards more circularity. Many complementary targets and deadlines must be respected by the municipalities all over Europe confronted with the biowaste management challenge.

Obligatory separate collection of biowaste by December 2023 for all municipalities

The revised **Waste Framework Directive** requires a separate biowaste collection or recycling at the source by 31 December 2023 (Directive 2018/851/EU, §10). This means that all municipalities must plan and implement separate biowaste collection schemes. They can do this by organising door-to-door collection of this organic fraction, or they can supply a number of biowaste collection points where citizens can drop off their biowaste. Alternatively, or in addition, municipalities can encourage citizens to dump their biowaste directly into home or community composting units (this is the meaning of “biowaste recycling at source”) so that it does not end up in the public collection system. Derogations from the separate collection of bio-waste will be only accepted based on environmental, technical and economic reasons. By 31 December 2021, Member States shall submit a report to the Commission on the implementation of separate collection as regards bio-waste, including on the material and territorial coverage of separate collection and any derogations.

In addition, the same Directive sets the EU target to recycle 65 % of municipal waste by 2035. Biowaste accounts for a third of municipal waste in the EU, thus representing the largest single component of municipal waste. Therefore, it has become practically impossible for municipalities to reach the 65% recycling target without addressing the biowaste challenge.

The Directive also states that separately collected bio-waste cannot be incinerated. Further constraints come from the revised [EU Landfill Directive \(EU\) 2018/850](#), which mandates that no more than 10% of municipal waste may end up on landfills by 2030 and prohibits landfilling of separately collected waste fractions.

What treatment of biowaste counts as recycling in line with the EU Directives?

Two mainstream treatment methods are available for biowaste: composting and anaerobic digestion (AD).

Composting is the dominant form of recycling of bio-waste in the EU at present. Over 90% of the separately collected food and garden waste is processed into compost. Composting is a rather straightforward process that requires a modest amount of capital investment upfront.

“Anaerobic digestion (AD) means the bacterial breakdown of organic materials in the absence of oxygen. This biochemical process produces a gas, called biogas.”

European Biomass Industry Association

“Composting is a process that involves the degradation of plant and animal residues into a stable, sanitised product called compost. **Compost** is the end product of the composting process and is a valuable soil improver as it contains stable organic carbon that can help maintain or increase the content of soil organic matter. It also contains a diverse range of micro-organisms that form an essential part of a healthy soil ecosystem.”

European Compost Network ECN

Alternatively, biowaste can first be put through an anaerobic digestion process to harvest the renewable biogas and the remaining material after

the digester (called digestate) can then be composted. Two process steps are naturally more costly than only one, but AD provides the added value of renewable gas generation in addition to the material recovery aspect given with composting.

For biowaste treatment to count towards the recycling targets, it must result in material recycling. The amount of municipal biodegradable waste that enters aerobic or anaerobic treatment may be counted as recycled where that treatment generates compost, digestate, or other output with similar quantity of recycled content in relation to input, which is to be used as a recycled product, material or substance. Where the output is used on land, it may only be considered as recycled if resulting in agriculture or ecological improvement.

End-of-waste materials to be used as fuels or other means to generate energy, be incinerated, backfilled or landfilled, cannot be counted towards the recycling targets.

The separate collection obligation must be viewed in the context of the subsequent treatment. Most experts are convinced that only separate collection of bio-waste results in sufficiently pure organic materials streams (free of plastics and other non-biodegradable materials) to ensure compliance with quality standards for compost and digestate.

What about mixed waste that currently undergoes treatment in mechanical and biological units (MBT) where it is sorted, and the organic fraction goes into a biogas plant or a composting plant or a combination of both? This won't help the recycling rate in the long run: The Directive's §11a says that as of 1 January 2027, municipal biowaste entering aerobic or anaerobic treatment may only be counted as recycled if it has been separately collected or separated at source. This implies that MBT will no longer count towards the biowaste recycling targets.

The EU taxonomy and biowaste treatment

The EU taxonomy is a classification system, establishing a list of environmentally sustainable economic activities. It provides appropriate definitions to companies, investors and policymakers on which economic activities can be considered environmentally sustainable, thus creating security for investors, protecting private investors from greenwashing, helping companies to plan the transition, mitigate market fragmentation and eventually helping shift investments.

The summary tables of the [Taxonomy Report's Annex](#) clearly classify AD from bio-waste as economic activity that substantially contributes to climate change mitigation both in the short and in the long-term (the activity is not considered transitional). This includes the activity in the sectors already at near-zero carbon level that must be expanded in line with the commitments under the EU Green Deal and with the expected climate law. Investing in this activity is recognised as not creating any lock-in effects in the mid-term, meaning the activity is in itself

The message for local and regional policy makers is clear: there is no way around the introduction of separate collection schemes for biowaste, and this separately collected waste stream must be treated in dedicated composting plants or in a combination of anaerobic digestion and composting plants. Then only, the material recycled may count towards the ambitious 65% overall recycling target for municipal solid waste.

Engaging public and private actors in circular biowaste management

Guest contribution from the Association of Cities and Regions for sustainable resource management (ACR+)

Authors: Agnese Boccalon, Jean-Benoît Bel

The members of ACR+ are cities and regions share the common aim of promoting sustainable management of resources and waste in line with the circular economy. What is your message regarding biowaste management to local policy makers and practitioners in view of the increasing EU ambitions and targets?

With the European Parliament Resolution of January 2020 to reduce food waste generation in Europe by 50% by 2030, food waste prevention is now an increasing priority for EU Member States. Currently revised EU Regulation sets biowaste collection mandatory across all Member States as per 2023. Its contribution to reach the new EU recycling target across all waste streams is vital.

Local authorities can deploy means to facilitate the sorting process by providing pre-collection equipment to inhabitants (aerated bins, biowaste dedicated bags) and set clear guidance to make sorting comfortable for private and commercial users. Door-to-door collection of sorted waste seems to give better performances in terms of capture rate and quality of waste collected. Quality control of conferred biowaste is indeed important for the biowaste processing stage, as contamination with non-organic waste negatively impacts the possible uses of the final recovered product.

At present, separation at source still represents the most common practice in many urban and regional contexts, although prevention of waste generation is gaining increasing importance. This is especially true for food waste, where food supply chain actors are out-scaling redistribution practices and developing new innovative solutions for food surplus reutilisation (i.e., buy-back systems by the HORECA sector). To further facilitate this system transformation, public authorities across Europe are then called upon to:

- a. Set and replicate wide-reaching social programs aimed at **raising awareness** across all food supply chain actors of the need to better align food supply to actual demand, reduce food surpluses and food waste, and realise the environmental and economic implications of waste generation and treatment;
- b. **Adopt effective fiscal measures** for taxing waste generation for all food supply chain actors (e.g. industry, HORECA and households) to create incentives for both waste reduction and waste separation at source (i.e. PAYT system) and avoid creating fiscal incentives for bio-waste byproducts that would intrinsically generate a demand for organic waste, i.e. bio-energy;
- c. At the national level, governments are called upon to **ease regulations on food redistribution** from commercial actors, lifting fiscal and product liability measures that hamper food redistribution and food donations;
- d. **Create new social spaces** and means for food redistribution and valorisation of local products. It is estimated that across Europe about 19% and 5% of food waste is generated at, respectively, the manufacturing/distribution and retail levels (FUSION project, 2016), incentivising local food markets and reliance on short food supply chains (FSC) has the potential to shrink food waste generation at the earlier stages of the FSC.

Experience from local and regional governments so far has shown that no high performance in waste management is achievable without the deployment of strong incentives (i.e. PAYT, sorting obligation) and that engagement of public and private sector actors to reach this shift is a mandatory route to this obtainment.

<https://acrplus.org/en/>

Policy solutions for improved biowaste management

To comply with the EU Directives' obligations as they enter into force, municipalities are in the front line.

Typically, municipalities are the “owners” of municipal waste, including biowaste. As owners of the problem, they are the ones who must ensure that the obligation of separate collection of biowaste is met by 2023, and that biowaste makes a significant contribution to meeting the overall recycling target of 65% by 2035. Thus, local policy makers are at the forefront of the design of policies for better management of biowaste.

Luckily, many local administrations have already made great progress regarding the separate collection and subsequent treatment of biowaste. The present chapter is devoted to showcasing good practices identified in the context of Interreg Europe projects that could inspire local and regional policymakers to take actions with regard to their own biowaste challenge. For the ease of reading, the chapter is divided into policies and good practices for separate collection of biowaste, treatment for biowaste to meet the recycling targets, and overarching biowaste management practices.

Separate collection of biowaste

Separate collection of biowaste is a pre-requisite for achieving the ambitious [European waste prevention and recycling targets](#). Implementing separate collection schemes offers many opportunities for municipalities and regions but also represents challenges. As pointed out in the guest contribution of ACR+, incentive schemes for both waste reduction and waste separation at source can play an important role to increase the separate collection of biowaste at source.

Many municipalities are already using Pay-as-you-throw (PAYT) tariff schemes to reduce the residual waste fraction where most biowaste is ending up today. Moreover, the new Know-as-you-throw (KAYT) concept is being introduced as a parallel information system to increase the awareness of citizens on their waste generation, savings and individual behaviour compared to the average. The [WINPOL](#) project has highlighted a good practice from the [Municipality of Seveso \(Italy\) that has reached a 80% recycling rate using the PAYT scheme](#). Further information and several case studies for separate waste collection are available at the [WINPOL thematic webinar](#) on innovative tariffication.

Current EU legislation also calls for **separate collection of waste oils**, as well as the achievement of an 85% regeneration target by 2025. If not collected, oils are often handled incorrectly by the users, in most cases poured into the sewer system. To this end, the [OPTIWAMAG](#) project has featured a good practice for another biowaste stream aiming at the [collection of vegetable oils](#) in the Italian city of Rubiera.

Here citizens place bottles with used vegetable oils into conveniently located big yellow bins. Every bin has a capacity of 800 liters and is replaced when three quarters full. The revenues from the sale of collected oils cover the cost of installing and emptying the bin. The collection of used oils in Rubiera has grown significantly after the installation of the bins, from 366 kg collected in 2018 to 11,460 kg collected in 2019.



PAYT

What is it?

Pay-as-you-throw tariff schemes (PAYT) are based on the “polluters-pay principle”. They dynamically charge waste producers on the basis of the actual amount of waste generated and provide incentives for the collection of recyclable waste and the reduction of mixed waste. The effect of PAYT dynamic tariffs is to make waste prevention, reuse and better separation at source for recycling more economically attractive, increasing the waste producer's responsibility.



KAYT

What is it?

Know-as-you-throw (KAYT) is an innovative concept to reduce municipal waste and increase separate collection through a knowledge & persuasion-driven approach. The idea is that the habits of citizens towards separate collection can be improved by informing them in a continuous and convenient way, combining technology, gamification, one-to-one meetings with real informers and some economic and/or social benefits.

Image credit : <https://rethinkwaste.eu/>

Home and Community Composting Support Scheme, Greater Porto, PT

To address the organic waste challenge, the Intermunicipal waste management company of the Greater Porto area, LIPOR, designed a strategy to foster composting of biowaste upstream, at source, avoiding that biowaste ends up in the public waste management system. The Home Composting scheme is an awareness project that promotes home/community composting and worm composting. Through intensive awareness campaigns and training workshops, residents are encouraged to start composting themselves, either at home, in community composting sites, or with home vermi-composters. The composters are given for free to all the residents that want to participate and each one gets in a training program to learn how to use it.

As result of the measure, the environmental indicators show an overall avoidance of 273 kg waste/year per worm composter and 423 kg waste/year per traditional composter. The city of Porto has 39 worm composters and 2,052 traditional composters, preventing the incineration of more than 870 tons of biowaste per year. One possible success factor is the fact that all the users are monitored, in order to answer to any problems that might occur and to keep them motivated to continue participating. This highly transferable good practice encountered a typical difficulty in the space limitations often present in inner city areas and overall in urban areas with a predominance of multi-apartment blocks.

Further information on the practice is [available here](#).

Home and community composting schemes

Home and community composting refers to the composting of domestic organic waste from kitchens and gardens by households or in a small community composting facility respectively. It avoids the economic costs and environmental burdens associated with organic waste collection. A major advantage of composting especially in regions with low organic waste recycling rates, is that it can generate "buy-in" from citizens who are otherwise less likely to separate organic waste, thus significantly decreasing residual waste volumes and increasing overall recycling rates.

Policy change in Latvia - The participation of Riga Technical University (RTU) in the OptiWaMag project has triggered a self-assessment of the Latvian waste management system and the revision of the National Waste Management Plan (NWMP) that now also encompasses separate collection, recycling and reuse of waste as a prerequisite of a circular economy of resources. Interregional learning and exchange with other regions facing similar challenges provided Latvian policy makers with inspiration and input for the crucial long-term choices leading to an improved waste management and recycling system in Latvia.

In July 2020, the results of the self-assessment research in the form of proposed priorities and recommendations were presented to Latvian stakeholders, including the Ministry for Environmental Protection and Regional Development, which is responsible for the waste management in Latvia. The stakeholders have agreed on research results and proposed priorities, in particular recommendations of RTU for establishing the system of separate collection of household waste and for starting the reuse process in Latvia. Most of the recommendations were taken into account in the further work of the Ministry for developing priority directions and actions of the NWMP 2021-2028 which was officially adopted by the Cabinet of Ministers of Latvia in January 2021. With regard to bio-waste, the new National Waste Management Plan now features the separate collection of biological waste from 2023; the use of specialised containers near multi-apartment residential buildings and of composting containers near single-family houses in Riga city is planned already to start this year.



■ **Food waste recycling through collection with the Green Bag (Linköping, Sweden)**

The Swedish government set a national target to sort and biologically treat at least 50 percent of food waste from households, commercial kitchens, shops and restaurants by 2018. Each municipality was responsible for the implementation of appropriate measures based on its collection system. In response to the national target, the "green bag" collection was introduced in Linköping in 2012. Residents of the municipality are asked to sort their food waste in a separate green bag which is, nevertheless, thrown out to the same container as household waste. These plastic bags are distributed free of charge and are fairly small, in order to prevent odour that would develop if the food waste remained in the bags for too long. When the waste gets collected and transported to the waste treatment plant, green bags are separated from the rest of the waste via an automatic optical sorting machine that recognizes the colour of the bags. The collected food waste is then digested together with other substrates and turns into biogas and biofertilizer. Biogas can serve as a fossil fuel substitute in industrial use or transportation. At the same time, nutrient-rich bio-fertilizer is spread on arable land. In 2019, 80 % of all households in Linköping used the green bag and approximately 55 % of all food waste was collected separately. The municipality was able to reach the national collection target, without any major changes to the collection system. The green bag concept has since become a widespread and popular food waste collection method in Sweden.

Further information about the practice is available [here](#).

■ **Home composting and economic incentives (Casalgrande, Italy)**

Food scraps and garden waste make up more than one third of our waste. The material that is currently disposed of could be turned into compost and used to fertilize the soil. In order to encourage citizens to compost, some municipalities in the Italian region of Emilia-Romagna decided to introduce economic incentives. The City Council of Casalgrande grants a 20% waste fee reduction to citizens who decide to compost the organic fraction of their waste directly in their garden, through the aid of a domestic composter. The effect is the reduction of the amount of putrefiable waste, which is complicated to manage, with positive effects on collection and cost reduction for treatment and disposal of waste. There are currently 200 residents who carry out domestic composting, which is equivalent to 26.8 tons of material composted each year. Important success factors of the scheme were good communication and trainings offered by the Environmental Education Centre. Thanks to its easy implementation, this practice is highly scalable and applicable in different regions and cities.

Further information about the practice is available [here](#).

■ **Promotion of domestic composting in Western Thessaly (Larissa, Greece)**

The promotion of domestic composting has become an important part of the Greek National and Regional Waste Management Plan to divert organic waste from landfills, and to greater circularity in the food sector. The waste management association "Environmental Development Agency of Western Thessaly" (P.A.DY.TH. S.A.) launched a pilot program to promote domestic composting in the municipalities of Regional Unit of Trikala and Karditsa. The program was designed in accordance with regional targets and the association distributed 51 composting bins in schools and 649 in selected households. In recognition of the need to engage the public to increase the effectiveness of the practice, PADYTH organised a series of information and dissemination activities in cooperation with the municipalities. Training and active support of users on segregation and composting procedures was carried out biweekly. The monitoring phase included data collection from households and schools, as well as door-to-door surveys to evaluate their engagement and record the results. The surveys revealed participant satisfaction with the design parameters and high environmental awareness. The pilot program of domestic composting proved the importance of cooperation between local authorities and schools to promote active participation of citizens.

Further information about the practice is available [here](#).

Image credit: www.greenmatterz.eu

Harvesting the opportunities of biogas for circular waste management

Guest contribution from European Biogas Association (EBA)

Authors: Mieke Decorte, Harmen Dekker

1. The production of biogas and biomethane are on the rise. Where are we standing today and what trends are you seeing?

Combined biogas and biomethane production in 2020 amounted to 191 TWh or 18.0 bcm of energy and this figure is expected to double in the next 9 years. By 2050, production can at least fivefold reaching over 1,000 TWh, with some estimates going up to 1,700 TWh. The total production is now already more than the entire natural gas consumption of Belgium and represents 4.6% of the gas consumption in the European Union. By 2050, 30 to 40% of Europe's total gas consumption could be made up of sustainable biomethane. The remaining future gas demand can be met by other renewable and low-carbon solutions such as green hydrogen. The development of synergies between green gases will be key to meeting future gas market demands. Over the last decade, the delivery of dispatchable power and heat from biogas has been very important and this will continue to some extent. However, the current trend places the emphasis squarely on sustainable biomethane production, and it is expected that this tendency will be amplified in the coming decade: biomethane is a versatile energy carrier, suitable for a range of sectors, including transport, industry, power and heating. 2020 saw the biggest year on year increase in biomethane production so far in spite of the pandemic, with an additional 6.4 TWh or 0.6 bcm of biomethane produced in Europe. An even bigger increase is to be expected in 2021, as a record number of new biomethane plants started production in 2020 and are due to become fully operational within 2021.

2. Looking at the available feedstocks, what is the potential for biogas and biomethane generation and which types of feedstocks will be used in the future?

In terms of feedstock, we see a rapid shift towards sustainable feedstocks such as agriculture substrates, municipal waste and sewage sludge. Since 2017, almost no new biomethane plants on energy crops have been built. We see for example sequential cropping and industrial wastewater as important feedstocks to become available in the coming years. In addition, improved waste management and collection programmes will increase the supply of food waste.

3. What is the potential for the transport sector and what role are playing bio-methane and bio-hydrogen?

The need for decarbonisation of all transport modes will be especially relevant for the coming years and thus the need for further renewable gas uptake in that sector. Biomethane can be used as a transport fuel in the form of Bio-CNG or Bio-LNG. The EBA expects, based on an inventory of confirmed projects, a sustainable Bio-LNG production capacity of 10.6 TWh per year by 2024. This projected 2024 production capacity could fuel 25,000 LNG trucks for the whole year. In comparison, NGVA expects an increase in LNG trucks from 12,000 today to 280,000 by 2030. A big advantage of the usage of biomethane as transport fuel is that it can take advantage of the already existing extensive network of CNG and LNG filling stations in Europe as those stations can easily switch to Bio-CNG and Bio-LNG without any need for heavy investments. There are 4,056 CNG and 441 LNG filling stations in service in Europe of which it is estimated 1,500 provide Bio-LNG and 100 Bio-LNG.

4. Biogas offers a lot of opportunities for greening regions. In your view, will it also impact job creation?

Replacing petrol or diesel with biogas and biomethane means replacing a fossil product based on imports with a locally produced product from local wastes and residues. That creates jobs and GDP growth. Biogas and biomethane industries are responsible for over 210,000 green jobs today. It is expected that our sector can create a total of approximately 420,000 jobs by 2030 and over one million jobs by 2050.

<https://www.europeanbiogas.eu/>

LCA analysis of various methods for biowaste valorisation (Helsinki, Finland)

When designing policies to utilize biowaste in an environmentally sustainable manner, regional governments need to follow the EU Waste Directive guidelines. Following the priority hierarchy, which puts material circulation above fuel production, the guideline suggests assessing types of biowaste utilization using the Life Cycle Assessment (LCA). The Finnish Environment Institute evaluated three methods from the life cycle perspective of potential environmental impact, comparing the use of biowaste in anaerobic digestion, biofuel and energy production.

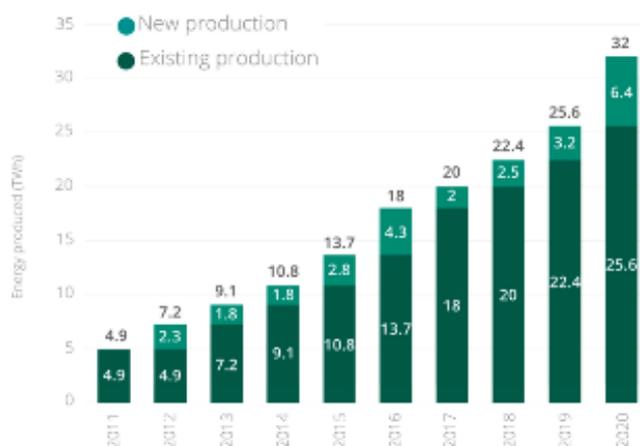
The study worked with widely available databases and focused specifically on the impact on climate change, acidification and eutrophication. The results show that in terms of direct environmental impact (within the analysed categories), anaerobic digestion is the best method for processing biodegradable waste, the second-best being biowaste incineration for energy production, followed by biofuel production. The results of the LCA study informed the preparation of the Finnish Waste Act, where the promotion of anaerobic digestion is now embedded. The outcome has also helped promote bio and circular economy initiatives and policies at the regional level.

Further information about the practice is available [here](#).

Recycling biowaste into biogas and fertiliser

The generation of biogas through anaerobic digestion has been steadily increasing over the last decade and has reached 191 TWh in 2020 (see guest contribution of the EBA). It is interesting to note that the **anaerobic digestion of bio-waste can count towards achieving both the renewable energy targets and the ambitious recycling targets of the European Union provided that with the biogas production from organic waste the digestate is recycled as a compost or fertiliser** as confirmed by the [Amendment of the Waste Framework Directive](#) (Article 48).

Policy change in South Ostrobothnia (Finland) – The Finnish project partner JPYP Business Service considered learning about the biogas production in other regions as one of the most important aspects of the [CESME](#) project. JPYP received first-hand information about good practices on biogas production from other CESME partners and took part in study visits to biogas production plants in Bulgaria, Italy and Greece (see boxes). The study visits provided detailed information about production capacities, technologies and machineries of the biogas plants. To test the ground, JPYP implemented a new project funded within the local development strategy of LEADER Aisapari region. The project financed a study investigating the opportunities for biogas production in the Lake District region of South Ostrobothnia. The study defined the requirements for setting up a biogas plant in the region. It also showed that the plant would be viable and pointed at several risk factors that needed investigating before a final investment decision.



Source : European Biogas Association, 2021



■ Perpetuum Mobile Albena , Bulgaria

Albena, one of the biggest Black Sea resorts, approaches hotel chain food management in a remarkably circular way. The company has decided to make its food operations more sustainable, and constructed a biogas plant (anaerobic digester) for agricultural and kitchen waste to produce digestate, electricity and heat. The generated electricity is usually sold to a utility company and the heat, currently used at a local greenhouse, will also be used for district heating in the future. The digested material is applied as fertilizer on company's agricultural fields, as well as the resort's parks and gardens. The produce from the farms is used to prepare meals in the hotels. The project provided Albena with many benefits, including efficient use of resources, positive reputation of the company, avoided costs, on-site production of high-quality fertilizer as well as fresh produce. There are opportunities for future cooperation with the municipality, who is interested in supplying the biogas plant with organic municipal waste. Similarly, organic waste from local farmers could potentially become additional supply for the plant.

Further information about the practice is available [here](#).

■ The Agrobioenergia biogas plant, Emilia-Romagna, Italy

In 2005, a group of 25 local farmers established Agrobioenergia, an agricultural cooperative with the aim of building a biogas plant, which was opened in 2010 and uses corn and agriculture by-products to produce biogas and digestate through anaerobic digestion. Biogas is treated in a cogeneration plant, where it is converted into electricity, which is sold to the grid and heat (part of which is used locally). The produced digestate is applied as fertilizer on local fields, replacing the previously used chemical fertiliser. The cooperative now aims to increase the project's resource efficiency and economic stability. To achieve that, they progressively increase the number of by-products in the mix that is fed to the bio gas plant, particularly to improve the economics of the process. At the same time a new herbal medicine dryer is being developed, which will use excess heat from the cogeneration plant, making the operation more efficient and circular.

Whilst the biogas plant brings numerous economic benefits to the farmers involved in the project, such as elimination of waste disposal costs, free fertilizer, reduced costs of biomass transport and new market possibilities, it also provides environmental benefits, including waste prevention, improved soil quality, decreased use of chemical fertilizers or production of renewable energy.

Further information about the practice is available [here](#).

■ Power generation from organic waste management, Greece

Biogas Lagada plant (1 MW) produces biogas from organic raw materials using anaerobic digestion. The majority of the input material consists of farm waste, such as cattle and poultry manure in both liquid and solid forms, dairy production waste, as well as silage from crops such as corn, wheat and rye. The waste has to be stored in digestion tanks under specific conditions (suitable temperature, anaerobic environment) and in the required quantity. Besides electricity, the whole process produces heat, part of which is used to keep the desired temperature in the digestion tanks, and digestate that is applied as fertilizer on agricultural land in the region. Currently, 240 tons of waste are collected and treated daily. Thanks to the biogas plant, the waste products are completely repurposed for other use. Without the plant, organic waste usually ended up untreated in various waste streams such as waste water treatment plants, or even illegally disposed of in nature, creating further treatment costs and negative environment impact. Additionally, the anaerobic digestion plant stands as a renewable energy technology with negative CO₂ balance.

Further information about the practice is available [here](#).

Image credit: www.greenmatterz.eu

Recommendations and key learnings

- For commercial producers of biowaste, such as canteens, restaurants and (super)markets, **implement a legal obligation to separately collect**. Start with these commercial producers as their relatively large biowaste streams represent the low-hanging fruit of implementing separate collection. Look at the good practice from [LCA4REGIONS](#) showcasing [Alentejo](#) (Portugal) for the valorisation of vineyards and olive grove prunings.
- **Raise citizen and stakeholder awareness** on the essence of biowaste and why it is important to manage it separately. Flyers for households, special action days, stands on markets, school actions etc. are all valuable means to bring people on board.
- **Encourage home and community composting** to reduce the biowaste ending up in the collection system altogether and recycle it at source as in [Casalgrande](#) (Italy) and [Western Thessaly](#) (Greece).
- **Offer clear guidance** to citizens on how to handle their kitchen waste, including visual guidance with explanations in all widely spoken languages of the area.
- **Provide clean and hygienic separate collection options** to households and collect these regularly and in line with the climatic requirements (increased frequency in summer and in hot climates vs once a week in winter and colder climates) such as the containers for vegetable oils in [Rubiera](#) (Italy) and the green bags in [Linköping](#) (Sweden).
- **Monitor citizen behaviour** and feed back to them in case of poor sorting, first friendly, and upon repeated infraction with fines.
- **Put a negative price tag** on mixed waste for households and business that increases with the quantity of waste generated. For instance, rethink municipal tariff systems to improve the urban waste governance through an innovative model based on PAYT + KAYT approaches as featured by the [WINPOL thematic webinar](#) on innovative tariffication and the [Municipality of Seveso](#) (Italy).
- **Recycle organic waste into compost animal feed and biogas** by either promoting home or community composting as in [Nitra](#) (SK), or supporting the setup of biogas plants for separately collected organic waste in areas of dense population.
- Close the loop by fitting the biogas plants with compressors and fuel your local waste trucks or public buses by compressed biogas (CBG) as in [Niepołomice](#) (PL).

European support for separate collection and recycling of biowaste

EU Financial Support

The Multiannual Financial Framework (MFF) adopted for the 2021-2027 programming period supports European regions in becoming greener and more circular. EU structural and investments funds (ESIFs) and direct funding instruments like the LIFE and Horizon Europe programmes will hence be accessible to projects aimed at untapping the high potential of biowaste in the lead up to a more circular economy.

In the next years the European Regional Development Fund (ERDF) could for instance support start-ups like the Utrecht-based DeClique to expand their operations and refine their technologies for the separation and CO₂-neutral collection of organic waste. It could also enable projects like BIOWASTE, which was run from 2017 to 2020 in the framework of the Interreg Balkan-Mediterranean programme to help regions in Greece, Northern Macedonia and Cyprus to implement 'Pay-As-You-Throw' (PAYT) schemes and roll-out Automated Composting Units (ACUs) for organic waste. It could be further used to explore innovative and creative solutions to reduce food waste, as it was the case of the Food Heroes project, jointly run by a number of regions and institutions from Belgium, France, the Netherlands, Ireland, Germany and the UK within the Interreg North-West Europe programme in the last 5 years.

During the 2014-2020 programming period the LIFE programme has supported the implementation of food waste reduction and prevention projects with almost EUR 90 million, generating an overall investment of EUR 160 million. In the present programming period, it will continue to enable projects on biowaste reduction and valorisation. The new regulation governing the programme between 2021 and 2027 allocated a budget of EU 1,35 billion to the subprogramme on 'Circular Economy and Quality of Life', which is expected to help the dissemination of best practices and solutions like those promoted by the FOSTER project, on the reduction of food waste in the restaurant industry of France, Italy, Spain and Malta, and demonstration projects like the one tested by the ZEOWINE project on the use of zeolite powder and composted wine industry waste to improve soil protection and grapevines quality.

Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of production systems and restoring Europe's ecosystems and biodiversity are two of the four 'key strategic orientations' of the Horizon Europe. As such, they were included in the first strategic plan that will guide the new EU research and innovation programme between 2021 and 2024. Horizon Europe Cluster 6 – on food, bioeconomy, natural resources, agriculture and environment – is expected to contribute to the two aforementioned key strategic orientations and will be the major source of financial support for R&I projects in the area of biowaste. Unlocking the potentials of the bio-economy and bio-based systems is indeed among the expected impacts pursued by the programme under Cluster 6.

Therefore such expected impact has been translated into various 'destinations' – and their related impact-driven packages of calls for proposals – that appear in the Horizon Europe work programme for 2021-2022. By way of example, in order to contribute to destination 'Fair, healthy and environment-friendly food systems from primary production to consumption' during its first year, a call for projects with a budget of EUR 12 million is foreseen to promote evidence-based decision-making to change social norms towards zero food waste. To progress on destination 'Circular economy and bioeconomy sectors', a EUR 9 million call for projects on mainstreaming inclusive small-scale bio-based solutions in European rural areas will be launched. These and other calls will enable projects like the Horizon 2020-funded Res Urbis, on the conversion of various types of urban biowaste into valuable bio-based products.

The new Interreg Europe 2021-2027 programme will provide opportunities for exchange of experience on any policy objective, including the possibility to test out solutions through pilot actions when justified. The first call for proposals is expected to open in the first semester of 2022.

The Interreg Europe Policy Learning Platform supporting regions and municipalities in meeting the biowaste challenge

Interreg Europe, through its [Policy Learning Platform](#), provides a number of services to both ongoing projects and the wider regional policy [Community](#). As well as operating the [Good Practice Database](#), drawing together the best of the good practices identified by projects, and providing a [Knowledge Hub](#) of policy briefs and articles, the Policy Learning Platform offers on-demand [Expert Support](#), including a helpdesk, matchmaking service and peer reviews to assist regions in their transition:

- Via the [Policy Helpdesk](#), policy-makers may submit their questions to receive a set of resources ranging from inspiring good practices from across Europe, policy briefs, webinar recordings, information about upcoming events, available European support and contacts of relevant people, as well as recommendations on matchmaking and peer review opportunities.
- A [Matchmaking](#) session is a thematic discussion hosted and moderated by the Policy Learning Platform and designed around the policy needs and questions put forward by the requesting public authority or agency. It brings together peers from other regions in Europe to present their experiences and successes to provide inspiration on overcoming regional challenges.
- [Peer Reviews](#) are the most deep and intensive of the on-demand services, bringing together peers from a number of regions for a two-day working session to examine the specific territorial and thematic context of the requesting region, discuss with stakeholders, and devise recommendations for the region.

Interreg Europe Policy Learning Platform information

- Policy Brief on [sustainable waste management in a circular economy](#)
- Policy Brief on [separate waste collection](#)
- Policy Brief on [food waste](#)
- Policy brief on [supporting local bioenergy development](#).
- Webinar recordings on "[Biogas from organic waste](#)":
- Recommendations from the online discussion about "[Financing and business models for biogas](#)"
- Helpdesk "[What does the EU taxonomy mean for the financing of biogas from biowaste?](#)"
- Helpdesk "[Can biogas be counted as recycling?](#)"

Other sources

- The [European Green Deal](#)
- The [new Circular Economy Action Plan](#)
- The revised [EU waste legislation](#)
- European Environment Agency [briefing on digital technologies](#)
- EC [Guidance for separate collection of municipal waste](#)
- [Regulation \(EU\) 2020/852](#) of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (dubbed "Taxonomy Regulation")

Interreg Europe Policy Learning Platform on Environment and resource efficiency

Thematic experts:

Astrid Severin – Katharina Krell – Magda Michalikova
a.severin@policylearning.eu

Contact us to share your views on this policy brief!



www.interregeurope.eu
December 2021

Image credit cover page: © Katharina Krell



**Interreg
Europe**



European Union | European Regional Development Fund