ZERO WASTE EUROPE

Bio-waste generation in the EU: Current capture levels and future potential

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Bio-based Industries Consortium

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Executive Summary

This report estimates the current and future availability of bio-waste in the EU27, besides UK and Norway, whose environmental and waste policies aim at aligning with EU ones. AS defined in EU regulations (the revised Waste Framework Directive), there are two major types of bio-waste: garden and food waste. This report focuses on food waste in particular (as the obligation stipulated at article 22 of the Waste Framework Directive drives its separation as one of most intriguing updates in the waste management strategies and practices) although calculations also cover bio-waste as a whole.

The first chapter briefly outlines the EU policy drivers for the management of bio-waste, one of which will be the new Waste Framework Directive (WFD), which mandates bio-waste separation from 1 January 2024 onwards. Other drivers from environmental policies are also mentioned.

In the second chapter, the methodology of the report is outlined. The report builds on public information and national data from the 27 Member States + UK and Norway[1] for bio-waste generation, adopting a few assumptions on how to calculate the current capture of bio-waste in the EU27+ and the theoretical potential.

The third chapter presents the results. In the EU27+, current capture of food waste is 15,112,788 tonnes per year, below 26% of the theoretical potential, estimated at 60,034,681 tonnes. It must be noted that the latter number is indeed only theoretical. Every type of collection aims at maximising capture, but will never reach 100%. With that in mind, the report defines a target capture level, the 'operational potential', of around 85% of the theoretical potential, so as to calculate how much food waste, currently left in mixed waste, may actually still be recovered.

The fourth chapter provides some best practices in bio-waste management. This includes the case of cities, including largest ones, and other jurisdictions where residential food waste collection has been implemented. BBI JU funded projects are also included as examples of best practices for sustainable management and valorisation of bio-waste to provide new bio-based compounds for chemicals, food-packaging and for agricultural sectors.

Finally, the report includes **country-specific factsheets** that provide calculations for various countries, and other specific information that is relevant to bio-waste management strategies and perspectives in every specific country.

About BIC and ZWE

The Bio-based Industries Consortium (BIC)

- BIC is Europe's leading industry association, putting circularity, innovation and sustainability at the heart of the European bioeconomy and the private partner in the €2 billion public-private partnership with the European Commission - the Circular Bio-based Europe Joint Undertaking (CBE JU).
- BIC's membership includes 300+ industry members covering the whole value chain, from primary production to the market, across multiple and diverse sectors including agriculture & agri-food, aquaculture & marine, chemicals and materials, including bio-based fibres and bioplastics, forest and forest-based sectors, market sectors, technology providers and waste management & treatment.
- BIC also has over 200 Associate Members representing academia, research organisations, trade associations, etc.
- BIC's mission is to build new circular bio-based value chains and to create a favourable business and policy climate to accelerate market uptake.

On Zero Waste Europe (ZWE)

Zero Waste Europe (zerowasteeurope.eu) is the European network of communities, local leaders, businesses, experts, and change agents working towards the same vision: phasing out waste from our society. ZWE wants to empower communities to redesign their relationship with resources, to adopt smarter lifestyles and sustainable consumption patterns, and to think circular.

[1] EU27 + UK and Norway are defined as "EU27+" throughout the report

1. Introduction

This report includes all findings from the updated survey on total generation, current captures and subsequent potential expansion of collection of food waste (as a sub-set of bio-waste) and bio-waste in general (which includes both food waste and garden/park waste); the survey covers EU Member States, the UK and Norway; a Country Fact Sheet is also included for each EU Member State, the UK and Norway.

The first survey was carried out in 2020, and it showed that only as little as 16% of food waste, and 32% of bio-waste, was captured by dedicated collections in EU27+ (i.e. EU + UK + NO). The update aims at assessing, whether there was an increase in captures, the likely influence of the obligation on separate management of bio-waste stipulated by Article 22 of the Waste Framework Directive, and the remaining "distance to target", i.e. how much potentially recoverable food waste and bio-waste are still lost in mixed (or "residual") waste and go to incineration, landfilling or other disposal routes

Separation of bio-waste, and of food waste in particular, is important under different angles, hence the relevance of this survey. Capturing bio-waste/food waste by means of separate collection, is one of the cornerstones of the European agenda on circular economy and bioeconomy in particular, for it allows the proper processing of bio-waste and food waste through bio-refineries, composting and AD sites, so that it be made into valuable organic compounds, soil improvers and renewable energy. Unfortunately, despite all the policy drivers in Europe, listed below, bio-waste (and food waste in particular) still represent a largely "untapped potential": with specific regards to food waste (whose separation is one of most important innovations to be considered in European strategies and practices promoted by the Waste Framework Directive), the key finding of this survey is that *in the EU27+, current capture of food waste is still as little as 15,112,788 tonnes per year, below 26% of the theoretical potential, estimated at 60,034,681 tonnes.*

This calls on local decision makers and investors, to consider new, optimised plans and actions, improved practices, but also on policy-makers to consider adopting legally binding targets to supplement the obligation stipulated in article 22 of the Waste Framework Directive (for an obligation may be complied with, also through implementation of schemes which are not result-oriented, and deliver comparatively poor performances in terms of captures)

1.1 EU policy drivers

The policy drivers for management of bio-waste at EU level, may be summed up as follows:

1. European Directive (EU) 2018/851, commonly known as the New Waste Framework Directive (WFD), included in the 'Circular Economy Package', mandates the introduction of separate collection of bio-waste as of 1 Jan 2024. Updating art. 22 of the WFD, it stipulates an obligation at the EU level to implement bio-waste collection.
2. Quality recycling is a key issue. The calculation of recycling rates to assess compliance with EU targets (65% "preparation for reuse and recycling", i.e. net recycling including organic recycling, by 2035) will have to subtract rejects, which are closely related to impurities included in separated fractions; this puts the emphasis on collection schemes that can ensure high quality of collected materials.
3. Other environmental drivers, aside from the Circular Economy vision and strategy, are propelling interest in separation, processing and recovery of bio-waste; in summary, they are:

    3.1 Europe's soils are losing organic matter at an unsustainable rate due to land use changes, modern agricultural practices and climate change. It is estimated that almost half of European soil has low organic matter content, which reduces its ability to retain water and nutrients, and to store carbon. Crucially, this reduces the productivity of the land and farmers' ability to grow crops. Collected bio-waste generates compost, which may be a useful source of stable organic matter. This process results in a mixture of organic carbon compounds that contribute to the soil's carbon pool.

    3.2 Repeated applications of compost can increase soil organic matter content and help improve soil functions, such as structure, microbial diversity and water retention capacity. These factors are important in both the long and the short term, and may prevent erosion, eutrophication, desertification:

3.3 Strategies to tackle climate change in the past few years have also emphasised the potential 'sequestration' of carbon in soils connected to use of soil improvers. At the EU level, the report 'Soils and climate change'[2] has drawn attention to the key role of carbon pools in soils in the global carbon balance, and the potential for sequestration to mitigate climate change. In one of its latest reports[3], the IPCC echoed these arguments, drawing policymakers' attention to the need to preserve and increase soil organic matter (through measures that include organic fertilisation).

3.4 The revised WFD and other regulations require EU Member States to promote the use of materials produced from bio-waste. This material contains valuable compounds that can serve as feedstock for the bio-based industry. Utilising these bio-waste streams as feedstock and conversion into value-added applications is only in the early stages of development.

All of this points toward increased emphasis at the global level on separation, processing and recovery of bio-waste. This generates a 'potential bio-waste tonnage' which may become available for subsequent processing, and which is mostly untapped at present. The following sections will provide calculations of such 'untapped potential' at the EU level, besides country-specific calculations.

[2] https://ec.europa.eu/environment/soil/review_en.htm

[3] https://www.ipcc.ch/site/assets/uploads/2019/08/4.-SPM_Approved_Microsite_FINAL.pdf

2. Methodology

Numerous national reports, and datasets from the EU27+ level, have been collected and considered for the survey.

The survey builds on the national results on food waste generation and treatment which are most valid and reliable in the relevant national resources; data have been filtered, and supplemented by assumptions taken from sectoral evidence and expertise, so as to estimate:

- the specific generation of bio-waste and, more specifically, food waste
- current separate collection of food waste, as a part of the larger bio-waste stream (i.e. food and garden waste).

2.1 Evidence from existing operational models

Existing operational models for collection of bio-waste (with specific regard to food waste/kitchen waste) have been taken into consideration, with particular reference to performance in terms of capture, backed by evidence and sectoral studies.

A review of operational experience shows different approaches to bio-waste collection, which may be grouped as follows:

- In some countries, such as most of Denmark[4], many areas in the Baltic countries and most of France, barely any food waste is collected separately for composting or digestion, although garden waste is collected separately by municipalities.
- In Belgium, the Netherlands, Austria, Germany, all of which traditionally rank amongst the lead performers for both bio-waste collection and recycling in general, separate collection of bio-waste takes place using *biobins*, or *biotonnen,* typically wheeled bins where garden and food waste are collected commingled.
    - In some countries – notably Belgium (Flanders) and the Netherlands – 'VGF waste collection' (vegetable, fruit and garden waste) is targeted, i.e. generally excluding meat and fish. This tends to leave a large part of food scraps in residual waste, which is also demonstrated by the high percentages of organics in residual waste.
    - In Germany and Austria, all food waste materials (Küchenabfälle) are targeted. Households are typically provided with kitchen caddies for temporary collection/storage in the kitchen.

The typical "Biotonne" scheme to collect commingled garden and food waste in place in Germany and most countries in central – northern Europe.

In terms of performance, commingled schemes for bio-waste (food + garden waste) without the use of compostable bags as a liner for food waste (which tend to make the system more user-friendly, thereby maximising capture) usually capture **10-30 kg per capita per year**. Table 1 shows a summary excerpted from a detailed investigation in Germany[5]. Despite the broad reach of separate collection schemes for bio-waste, in 2017 only 34-42% of food waste was captured through the municipal separate collection scheme (Biotonne); only about 30% of the collected bio-waste was food waste, with the remaining 70% being garden waste.

[4] with the exception of e.g. the National Capital Copenhagen, which recently rolled out separate collection of food scraps, based on models implemented in Southern Europe.

[5] Source https://www.bmel.de/SharedDocs/Downloads/DE/_Ernaehrung/Lebensmittelverschwendung/TI-Studie2019_Lebensmittelabfaelle_Deutschland-Langfassung.pdf?__blob=publicationFile&v=3

Table 1: distribution of food waste across different streams in Germany, summary findings (Schmidt et al.)

	FOOD WASTE IN MASS %	
	(Gusia, 2012)	(Hübsch and Adlwarth, 2017)
Residual waste	37	33
Biobin	42	34
Home composting	9	9
Feeding	4	6
Sewerage	8	14
Others		3

- In many areas in Norway, Italy, certain parts of the UK (e.g. Wales) and Spain (e.g. Catalonia, the Basque Country), the common collection scheme focuses mainly on food waste, leaving garden waste as a separate fraction to be collected at civic amenity sites or with specific collection rounds (at reduced frequency of collection so as to promote home composting to the largest possible extent). The basic concept is to seek to avoid drawing excess garden waste into the collection system by offering small containers to households for the collection of food waste only. Households are given caddies with liners of either paper or EN-13432 certified compostable bags. Also, to increase user friendliness, the caddies are typically vented to promote evaporation of excess moisture and make the contents more manageable. On account of the higher density of food scraps, the material is typically collected in non-compacting (thus less expensive) trucks, with a higher frequency of collection, which in turn maximises participation in the scheme. Such schemes typically allow collection of **60-100 kg per capita** per year of food waste.
  Star performers include:
  - The city of Milan. With 1.37 million people, it's the largest city in Europe to cover 100% of the population with a food waste collection scheme, capturing 103 kg per capita. Milan is an example of the implementation of a scheme in a densely populated area.
  - Many other Catalan, Welsh and Italian areas, as shown in the following map. According to 2018 data, in Italy around 5,000 municipalities (46 million people, 76% of the population) captured more than 60 kg per capita of food waste.

The common separate collection scheme aimed at high capture of food waste

Figure 1: Food waste capture in Italy, kg per capita (kg/ca), 2018. Source: ISPRA

2.2 Assumptions and calculations

On account of the broad range of conditions in bio-waste management, and large differences in collection models, an estimate based on common EU-wide parameters would not be appropriate. Therefore, data for the EU27+ were calculated based on country-specific calculations.

2.2.1 Estimated total generation of Bio-waste (theoretical potential)

The calculation of the theoretical potential was based on a set of public reports and national data, defining bio-waste as the sum of food waste and garden waste, with the following assumptions:

The reference data is a study[6] published in 2014 showing the generation of municipal food waste (households + food service). These data are country-specific and closely in line with the estimates provided by the EU-funded project FUSIONS, which get to an EU average of 113 ± 12 kg per capita. In any case, *whenever more specific and reliable estimates have been found at the national level, those estimates have been used.* The adopted values are reported in Table 3.

Table 3: Adopted unit values for generation of food waste

EU 27	**116.7**	FRANCE	122.3	NORWAY	78.8
EU27+	**115,5**	GERMANY	94.4	POLAND	112.0
AUSTRIA	118.5	GREECE	142.7	PORTUGAL	12.,2
BELGIUM	105.7	HUNGARY	110.0	ROMANIA	127.7
BULGARIA	80.2	IRELAND	118.2	SLOVAKIA	84.4
CROATIA	84.4	ITALY	127.7	SLOVENIA	108.4
CYPRUS	79.8	LATVIA	107.4	SPAIN	144.0
CZECHIA	93.7	LITHUANIA	121.4	SWEDEN	105.7
DENMARK	103.5	LUXEMBOURG	118.3	UK	118.1
ESTONIA	111.8	MALTA	113.3		
FINLAND	102.0	NETHERLANDS	111.8		

The potential maximum generation was calculated according to the following table, taking into account the percentage of the population living in cities, suburbs and rural areas (from EUROSTAT). *Specific national data have been considered and adopted, though, whenever they diverged significantly from the results of this calculation.*

[6] Bräutigam, K.-R., Jörissen, J., Priefer, C. T*he extent of food waste generation across EU-27: Different calculation methods and the reliability of their results* (2014) *Waste Management and Research*, 32 (8), pp. 683-694.

Table 4: Assumed unit values (kg/person.year) for generation of garden waste in various housing/climatic conditions

	NORTHERN AND CONTINENTAL CLIMATE	MEDITERRANEAN CLIMATE
CITIES	40	10
TOWNS AND SUBURBS	160	50
RURAL	200	100

These parameters were then applied to the following distribution of the population in various countries, so as to estimate the contr/ of garden waste to total bio-waste theoretical potential.

Table 5: Population breakdown by country

	TOTAL POPU-LATION (MIL.)	% CITIES	% TOWNS AND SUBURBS	% RURAL		TOTAL POPU-LATION (MIL.)	% CITIES	% TOWNS AND SUBURBS	% RURAL
AUSTRIA	8.98	31%	31%	38%	LATVIA	1.88	43%	19%	37%
BELGIUM	11.62	28%	54%	18%	LITHUANIA	2.81	44%	2%	54%
BULGARIA	6.84	45%	23%	32%	LUXEMBOURG	0.65	15%	44%	41%
CROATIA	3.86	29%	32%	38%	MALTA	0.52	90%	10%	0%
CYPRUS	0.90	51%	32%	18%	NETHERLANDS	17.59	56%	33%	11%
CZECHIA	10.52	30%	34%	36%	NORWAY	5.43	29%	39%	32%
DENMARK	5.87	33%	34%	33%	POLAND	37.65	34%	24%	41%
ESTONIA	1.33	60%	8%	32%	PORTUGAL	10.35	45%	29%	26%
FINLAND	5.55	39%	33%	29%	ROMANIA	19.04	29%	25%	46%
FRANCE	67.96	48%	19%	33%	SLOVAKIA	5.43	22%	36%	42%
GERMANY	83.24	36%	41%	23%	SLOVENIA	2.11	19%	35%	46%
GREECE	10.46	40%	31%	29%	SPAIN	47.43	51%	23%	26%
HUNGARY	9.69	33%	34%	33%	SWEDEN	10.45	40%	40%	20%
IRELAND	5.06	46%	22%	31%	UK	67.60	59%	28%	13%
ITALY	59.03	34%	41%	25%					

2.2.2 Current captures

EUROSTAT (latest update February 2024, with most data related to year 2022), link, was used as a primary source of data for bio-waste collected; however, this data source had to be double checked using national statistics office data in order to fill gaps and to accommodate possible flaws, namely;

- Member States with no data for 2022 (AT, BG, CZ, FI, GR, IE, IT, LV, PT): either detailed search on national statistics databases or data related to 2021 has been used.
- Member states with no data reported on Eurostat for the last 2 years (IE, MT), with significative decreasing amounts in 2022 compared to 2021 (FR), with abnormal fluctuation in recent 3 years of data (DK): search in national statistics database.
- For the UK, a detailed search on the statistical databases of of the UK's four countries were performed.

The following table summarises the detailed national data sources used to complement Eurostat data.

Table 6: List of sources

	REFERENCE YEAR	SOURCE (NAME + LINK)
DENMARK	2022	Ministry of Environment waste data
FRANCE	2021	National Statistic Institute
IRELAND	2021	Environmental Protection Agency
ITALY	2022	Environmental Protection Agency
MALTA	2022	National Statistics Office
UK	2022	Waste Offices from England, Scotland, Wales, Northern Ireland

Table 7: Reported capture of bio-waste

	TOTAL POTENTIAL GENERATION OF BIO-WASTE (FOOD + GARDEN) Kgs/person/year, see methodology	CURRENT BIO-WASTE CAPTURE, 2021-2022 Kgs/person/year
EU 27	**220**	**103**
EU 27+	**219**	**98**
AUSTRIA	257	174
BELGIUM	239	152
BULGARIA	199	10
CROATIA	225	24
CYPRUS	118	11
CZECHIA	232	73
DENMARK	273	202
ESTONIA	213	15
FINLAND	227	77
FRANCE	238	104
GERMANY	220	149
GREECE	192	8
HUNGARY	244	39
IRELAND	235	66
ITALY	176	123
LATVIA	230	37
LITHUANIA	251	102
LUXEMBOURG	277	200
MALTA	128	52
NETHERLANDS	209	86
NORWAY	216	15
POLAND	247	79
PORTUGAL	244	78
ROMANIA	271	15
SLOVAKIA	235	79
SLOVENIA	264	79
SPAIN	187	78
SWEDEN	226	82
UK	212	65

Estimates of captured food waste were the most challenging assumption, as most countries report bio-waste or 'organic waste': the sum of both food and garden waste.

The following assumptions were therefore made, based on the performance of various collection schemes and the related composition of bio-waste (see section 2.1):

- Countries with mostly commingled schemes: 20% of collected bio-waste assumed to be food waste.
- Countries where no food waste collection is in place e.g. Bulgaria: 0% of collected bio-waste assumed to be food waste.
- Countries with data available for the two separate streams (Italy, Norway, Denmark, Malta, UK): national data on collected food waste used.

3. Results

These assumptions and calculations led to the final estimation of total ***theoretical potential generation of food waste in the EU27+***, and finally, ***a comparison to current capture***, as shown in the Tables 8-10 and Figure 2.

Table 8: Theoretical potential generation of food waste EU27+

		FOOD WASTE GENERATION (THEORETICAL POTENTIAL)		BIO-WASTE GENERATION (THEORETICAL POTENTIAL)
	POPULATION, JAN 2022 (EUROSTAT)	ADOPTED UNIT VALUE Kgs/person/year	TONNAGE	BIO-WASTE (tonnes)
EU 27	**446.820.419**	**116.7**	**52.157.348**	**98.226.506**
EU 27+	**519.841.689**	**115.5**	**60.034.680,8**	**113.738.053**
AUSTRIA	8.978.929	118.5	1.064.228	2.304.038
BELGIUM	11.617.623	105.7	1.227.983	2.781.491
BULGARIA	6.838.937	80.2	548.449	2.304.038
CROATIA	3.862.305	84.4	326.088	867.429
CYPRUS	904.705	79.8	72.200	107.140
CZECHIA	10.516.707	93.7	985.878	2.441.390
DENMARK	5.873.420	103.5	607.899	1.280.818
ESTONIA	1.331.796	111.8	148.933	283.231
FINLAND	5.548.241	102.0	565.992	1.258.190
FRANCE	67.957.053	122.3	8.313.315	16.204.488
GERMANY	83.237.124	94.4	7.834.000	18.291.912
GREECE	10.459.782	142.7	1.492.849	2.003.391
HUNGARY	9.689.010	110.0	1.065.908	2.362.685
IRELAND	5.060.004	118.2	598.032	1.190.052
ITALY	59.030.133	127.7	7.537.688	10.402.420
LATVIA	1.875.757	107.4	201.395	431.738

LITHUANIA	2.805.998	121.4	340.652	704.533
LUXEMBOURG	645.397	118.4	76.363	178.568
MALTA	520.971	55.934	59.041	66.428
NETHERLANDS	17.590.672	111.8	1.967.362	3.669.435
NORWAY	5.425.270	78.8	427.511	1.174.462
POLAND	37.654.247	112.0	4.216.206	9.299.530
PORTUGAL	10.352.042	127.2	1.317.010	2.528.613
ROMANIA	19.042.455	127.7	2.431.546	5.166.043
SLOVAKIA	5.434.712	84.4	458.844	1.275.355
SLOVENIA	2.107.180	108.4	228.368	555.571
SPAIN	47.432.893	144.0	6.830.337	8.854.298
SWEDEN	10.452.326	105.7	1.104.841	2.359.538
UK	67.596.000	118.21	7.985.764	14.337.085

Table 9: Calculation of collected food waste, kg/person

	TOTAL BIO-WASTE COLLECTED kgs/person	% OF FOOD WASTE IN COLLECTED BIO-WASTE	CALCULATED FOOD WASTE COLLECTED
EU 27+	**103**	**29%**	**26%**
EU27	**98**	**30%**	**24,9%**
AUSTRIA	174	20%	29%
BELGIUM	152	20%	29%
BULGARIA	10	0%	0%
CROATIA	24	20%	6%
CYPRUS	11	20%	3%
CZECHIA	73	20%	16%
DENMARK	202	25%	49%
ESTONIA	15	20%	3%
FINLAND	77	20%	15%
FRANCE	104	20%	17%
GERMANY	149	20%	32%
GREECE	8	20%	1%
HUNGARY	39	20%	7%
IRELAND	66	20%	11%

	TOTAL BIO-WASTE COLLECTED (CHOSEN VALUE) kgs/person	% FOOD WASTE IN COLLECTED BIO-WASTE	FOOD WASTE COLLECTED kgs/person
ITALY	123	75%	72%
LATVIA	37	20%	7%
LITHUANIA	102	20%	17%
LUXEMBOURG	200	20%	34%
MALTA	52	83%	38%
NETHERLANDS	154	20%	28%
NORWAY	80	55%	56%
POLAND	52	20%	9%
PORTUGAL	86	20%	14%
ROMANIA	15	20%	2%
SLOVAKIA	79	20%	19%
SLOVENIA	78	20%	14%
SPAIN	105	20%	15%
SWEDEN	82	20%	16%
UK	65	35%	20%

Finally, Table 10 and Figure 2 compare current capture of food waste and bio-waste (the latter providing a snapshot of current implementation of EU bio-waste strategies) with the theoretical potential, showing the current 'untapped potential'. The numbers show that current capture tends to be higher as a percentage of potential capture for bio-waste than for food waste, demonstrating that collection of food waste is, on average, in earlier stages than that of garden waste (and bio-waste as a whole, which is driven by garden waste in early stages of implementation).

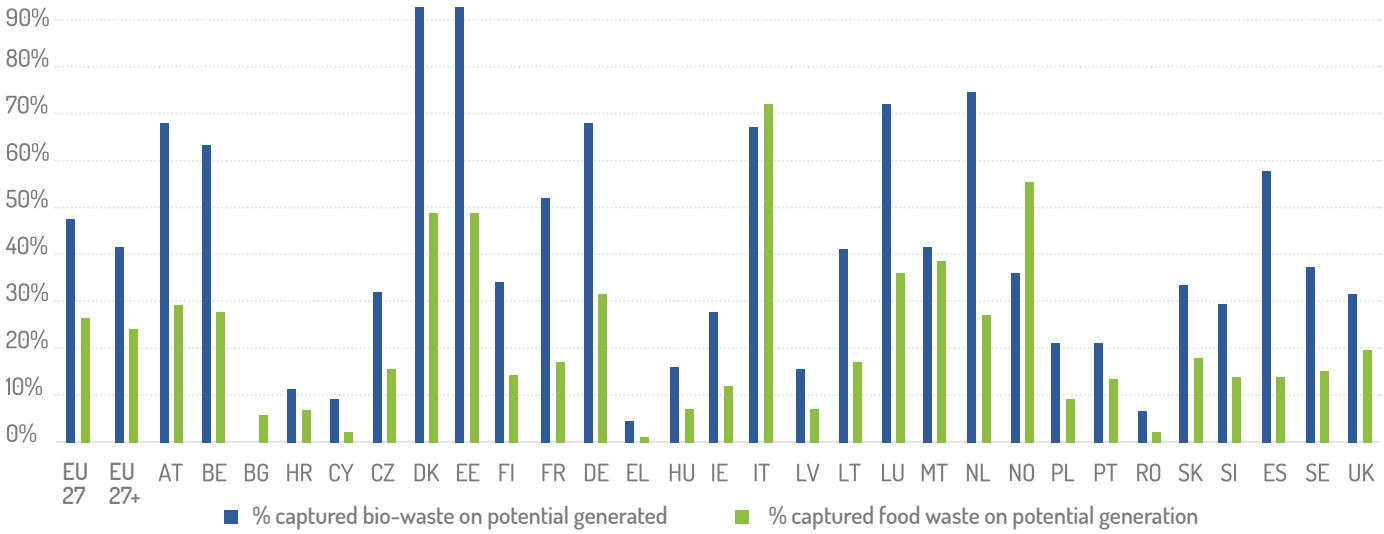
Thus, the implementation of strategies and practice to collect food waste will be one of the main drivers to increase overall recycling rates in the near future.

Table 10: Comparison theoretical potential / currently collected (food waste and bio-waste)

	ESTIMATE FOOD WASTE COLLECTED / POTENTIAL GENERATION	FOOD WASTE COLLECTED: % INCREASE 2022 / 2018	ESTIMATE BIO-WASTE COLLECTED (FOOD + GARDEN) / POTENTIAL GENERATION	BIO-WASTE COLLECTED: % INCREASE 2022 / 2018
EU 27	**26%**	**+64%**	**47%**	**+46%**
EU 27+	**24,9%**	**+43%**	**45%**	**+39%**
AUSTRIA	29%	+53%	68%	+53%
BELGIUM	29%	+85%	63%	+85%
BULGARIA	0%		5%	
CROATIA	6%	+225%	11%	+225%
CYPRUS	3%	-42%	9%	-42%
CZECHIA	16%	+61%	31%	+61%
DENMARK	49%	+123%	93%	+12%
ESTONIA	3%	-8%	7%	-8%
FINLAND	15%	0%	34%	0%
FRANCE	17%	-19%	44%	-19%
GERMANY	32%	+19%	68%	+19%
GREECE	1%	-74%	4%	-74%
HUNGARY	7%	+42%	16%	+42%
IRELAND	11%	+40%	28%	+40%
ITALY	72%	+52%	70%	+25%
LATVIA	7%	+63%	16%	+63%
LITHUANIA	17%	+194%	41%	+194%
LUXEMBOURG	34%	+151%	72%	+151%
MALTA	38%	+815%	41%	+121%
NETHERLANDS	28%	+81%	74%	+81%
NORWAY	56%	+25%	37%	+25%
POLAND	9%	+94%	21%	+94%
PORTUGAL	14%	+685%	35%	+685%
ROMANIA	2%	-17%	6%	-17%
SLOVAKIA	19%	+100%	34%	+100%

SLOVENIA	14%	+7%	30%	+7%
SPAIN	15%	+462%	56%	+462%
SWEDEN	16%	+13%	36%	+13%
UK	20%		31%	-12%

Figure 2: comparison theoretical potential / currently collected (food waste and bio-waste)



3.1 Further calculations on food waste: operational potential and a comparison to current captures

With specific regard to food waste, which is the key focus of this survey, it must be noted that the theoretical potential (potential generation) is only a *theoretical goal*. Every type of separate collection aims at maximising captures, but never get as high as 100% of the targeted material. This is sensibly expected, and for food waste it depends on:

- Errors/confusion in behaviour of households and other waste producers: this is a component that should be continuously targeted with information and communication, building on the composition of e.g. residual waste to inform people what types of materials are most often wrongly sorted (e.g. bones or shells, meat, food still attached to packaging).
- Errors in the design and rollout of the collection scheme: e.g. households leaving the city, who cannot wait until the next collection round is planned. Much as this may be addressed by ancillary actions (e.g. drop-off sites at Municipal Recycling Centres), the situations may be difficult, so capture shortfalls must be accepted to some extent.
- Adoption of practices such as home composting (which may be promoted to a larger extent in the near future). Because 100% capture will never be achieved, we considered a more sensible goal, defining a targeted 'operational potential' in line with best practices. Based on data from long-standing and well-functioning schemes, in both villages and cities, this may be fixed at around 85% of the theoretical potential[8]. Finally, we compared current capture of food scraps with the 'operational potential', to define how much room there is for improvement in capturing food waste.

We took a different approach to garden waste, because municipal collection services for it should aim at a lower capture rate. The basic assumption is that if households generate garden waste, at least some of it can be managed in their own gardens by home composting, which should be encouraged by specific campaigns. Meanwhile, kitchen waste cannot be taken care of completely through home composting schemes, especially in urban areas, which is why we set the 85% collection target.

Table 11 shows the shortfall between current food waste capture and operational potential: the amount of food waste that currently goes to mixed or residual waste, which can be reduced by implementing dedicated schemes or optimising current ones.

[8] 1674 municipalities in Italy have collected in 2018 more than 108 kg/capita of food waste, which represents 85% of the estimated generation according to the literature assumptions referenced. Amongst them, 408 are medium-large cities with more than 10,000 inhabitants and notably the city of Milan (1.4 M inhabitants) is very close to that target, collecting 103 kg/capita/year. Some other regions are catching up by replicating the same scheme, based on door-to-door collection. In Catalonia, 61 municipalities are achieving similar results, including some medium-sized cities such as Argentona or Sant Sadurní d'Anoia.

Table 11: Comparison of theoretical potential food waste, operational potential, current capture and shortfall.

	THEORETICAL FOOD WASTE GENERATION PER CAPITA	THEORETICAL POTENTIAL (TONNES) (See Table 8)	POTENTIAL CAPTURE WITH OPTIMISED COLLECTION SCHEMES (operational potential, 85% of theoretical potential), tonnes	CURRENT CAPTURE (TONNES)	SHORTFALL (TONNES)
EU 27		**52.157.348**	**44.333.745**	**13.578.084**	**30.755.661**
EU 27+	**116.7**	**60.034.680,8**	**51.029.479**	**15.112.788**	**35.916.691**
AUSTRIA	118.5	1.064.228	904.593	312.467	592.127
BELGIUM	105.7	1.227.983	1.043.785	353.176	690.610
BULGARIA	80.2	548.449	466.181	-	466.181
CROATIA	84.4	326.088	277.175	18.539	258.636
CYPRUS	79.8	72.200	61.370	1.990	59.379
CZECHIA	93.7	985.878	837.996	153.544	684.453
DENMARK	103.5	607.899	516.714	296.325	220.390
ESTONIA	111.8	148.933	126.593	3.995	122.598
FINLAND	102.0	565.992	481.093	85.443	395.650
FRANCE	122.3	8.313.315	7.066.318	1.413.507	5.652.811
GERMANY	94.4	7.834.000	6.658.900	2.480.466	4.178.434
GREECE	142.7	1.492.849	1.268.922	16.736	1.252.186
HUNGARY	110.0	1.065.908	906.022	75.574	830.448
IRELAND	118.2	598.032	508.327	66.400	441.927
ITALY	127.7	7.537.688	6.407.034	5.456.950	950.084
LATVIA	107.4	201.395	171.186	13.881	157.305
LITHUANIA	121.4	340.652	289.554	57.242	232.311
LUXEMBOURG	118.3	76.363	64.909	25.816	39.093
MALTA	113.3	59.041	50.185	22.589	27.596
NETHERLANDS	111.8	1.967.362	1.672.258	541.793	1.130.465
NORWAY	78.8	427.511	363.385	238.712	124.673
POLAND	112.0	4.216.206	3.583.775	391.604	3.192.171
PORTUGAL	127.2	1.317.010	1.119.458	178.055	941.403
ROMANIA	127.7	2.431.546	2.066.814	57.127	2.009.687
SLOVAKIA	84.4	458.844	390.017	85.868	304.149
SLOVENIA	108.4	228.368	194.113	32.872	161.241
SPAIN	144.0	6.830.337	5.805.786	996.091	4.809.695
SWEDEN	105.7	1.104.841	939.115	171.418	767.697
UK	118.1	7.985.764	6.787.900	1.564.608	5.223.292

4. Best practices

In the following pages we present examples of best practices in bio-waste management, backed by evidence of results focusing on the quality/quantity of food waste captured.

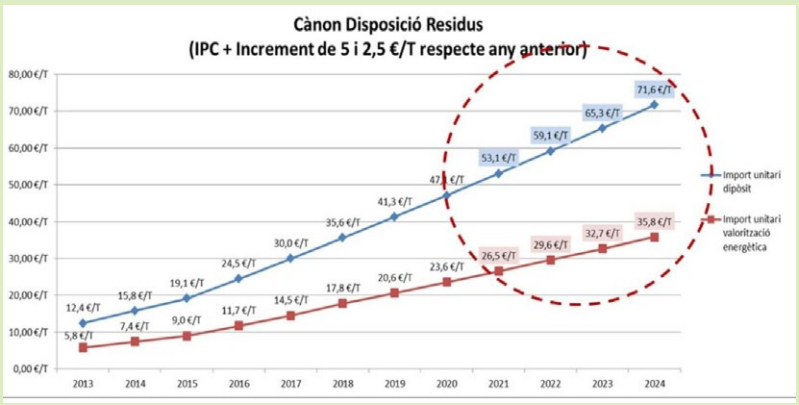
4.1 Milan: Door-to-door food waste collection in a large and dense city

Milan is an outstanding example of how residential food waste collection has been implemented in a large and densely populated city. With 1.4 million residents, more than 80% living in multifamily buildings, and with a population density of more than 7,000 people/km^2, it's now a beacon for other cities around the world when it comes to capturing food waste.
According to the latest data (2019), Milan is capturing about 105 kg per capita per year of food waste alone. This is astonishing, considering that the estimated total generation of food waste is around 120 kg per capita.

Residential food waste collection was rolled out in Milan in 2014, with an information campaign reaching every household and delivering a 10-litre vented kitchen bin along with a roll of 25 compostable bags. In addition to quantity, quality is assessed quarterly and results show a low level of contamination, around 5%. One of the key factors in the successful implementation of separate collection was that Milan represented the last 'blank spot' on the map, i.e. the last municipality without bio-waste collection in an area where separation of food waste had been implemented for many years in almost all surrounding municipalities. Citizens were already prepared for the change, accepting the additional effort of using the vented kitchen caddy and delivering food waste in compostable bags in the 'waste storage' room or area inside their building. A dedicated service by caretakers is needed to set out the bins and bags just a couple of hours before the collection and to retrieve them, but this extra cost proved to be acceptable. A door-to-door scheme with transparent bags for residual waste and plastic packaging allows visual inspections by a dedicated crew, who can issue fines to a building for improper sorting.

4.2 Economic instruments to encourage separate collection of food waste: the landfill tax in Catalonia

The landfill tax and refund scheme in Catalonia is an impressive example of how a public authority can promote separate collection of bio-waste in a structured and continuous way.
Despite not having a national landfill tax, Article 16 of the Spanish Waste Act allows waste authorities from autonomous communities (regions) to apply economic incentives, to promote waste prevention and separate collection. Catalonia set up an incentive scheme managed by the Waste Agency of Catalonia (ARC), based on the idea that bio-waste collection and treatment costs must be made cheaper than disposal into landfill or incineration. At least 50% of the revenue generated by the disposal tax must be allocated to biological treatment of bio-waste and mechanical-biological treatment of residual



Trend of the Landfill (in blue) and incineration tax (in red) established in Catalonia over time and foreseen increase up to 2024. Chart taken from ARC - Waste Agency of Catalonia

waste, while the remaining revenue is refunded to local authorities according to their performance on separate collection of bio-waste. This includes coefficients to account for the quality of bio-waste collected, hence a mandatory set of waste composition analyses are carried out, using part of the funds from the landfill tax.
The tax is increasing (for landfill it is €47.1/t in 2020, planned to increase to €70/t in 2024) to encourage separate collection of bio-waste; municipalities that don't present an implementation plan pay a higher tax. Practically all municipalities have implemented separate collection of bio-waste, and the target for the near future is to address quality (contamination level <10%) and quantity, as well as experimenting with new collection schemes.

4.3 Networking to promote food waste collection in France: Reseau Compost Plus

Reseau Compost Plus (compostplus.org) is a network of municipalities promoting separate collection of bio-waste in France, where this practice was neglected for many years on account of the large diffusion of mixed waste composting sites.
Since 2007, the network has brought together pioneer communities in the separate collection of bio-waste.
The association was created in 2011, at the initiative of six communities wishing to strengthen the sector's visibility at the national level. Today it brings together 28 agglomerations, with around 9 million inhabitants. Some of its members, such as the agglomeration of Lorient (25 municipalities, 207,000 inhabitants), introduced food waste collection in early 2002 with good results, with around 40 kg per capita of food waste collected each year. Another example of best practice is Le Syndicat Mixte de Thann–Cernay, which has achieved 66 kg per capita of food waste separated. Reseau Compost Plus is active in disseminating public information, recently publishing guidelines including very good recommendations and cost assessments. The network manages a Quality Assurance Scheme for compost (ASQA label) to certify compliance with high standards, and organises local events to promote best practices in separate collection.

Guideline for separate collection aimed at high capture of food waste, published by Reseau Compost Plus (France)

4.4 Innovation to tackle the food waste problem

Private and public partners are already funding projects to tackle the issue of food waste. For example, several projects funded by the Bio-based Industries Joint Undertaking (BBI JU), a public-private partnership between the European Commission and BIC, are centred around food waste.
The Circular Biocarbon project will develop a first-of-its-kind flagship biorefinery to valorise the organic fraction of municipal solid waste into four value-added products and a range of other intermediate products. It will do this through a biorefinery, organised through a pool of cascading technologies. This will treat urban waste streams, including the organic fraction of municipal solid waste and sewage sludge, in order to demonstrate that the process is capable of handling all the bio-waste produced by a medium-sized city.
The WASTE2FUNC project focuses on lactic acid and biosurfactants sourced from sustainable agricultural and industrial (food) WASTE feedstocks as novel FUNCtional ingredients for consumer products. The WASTE2FUNC project will integrate fluctuating supplies of agricultural food crop biomass waste with an industrial food waste supply chain in order to demonstrate the potential for converting this combined stream into lactic acid and microbial biosurfactants as functional ingredients of home and personal care applications.
The LUCRA project will use the EU's abundant and underutilised organic municipal solid waste and wood waste to produce bio-based succinic acid – a platform chemical for which there is significant demand in industry. It will deploy innovative hydrolysis methods to release carbohydrates from the waste and ferment them for the extraction of bio-succinic acid.

Country Factsheets

AUSTRIA

TOTAL POPULATION (MILLION): **8.97**

% CITIES: **31.0%**

% TOWNS AND SUBURBS: **30.8%**

% RURAL: **38.2%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **118,5**

POTENTIAL GENERATION (T): **1.064.228**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **904.593**

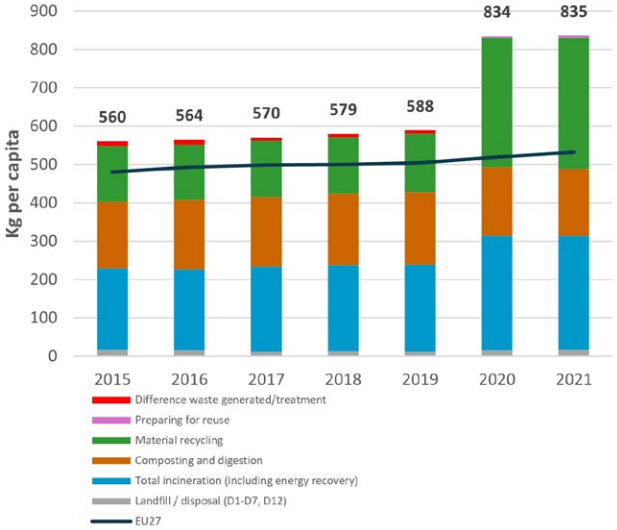
CURRENT CAPTURE (T): **312.467**

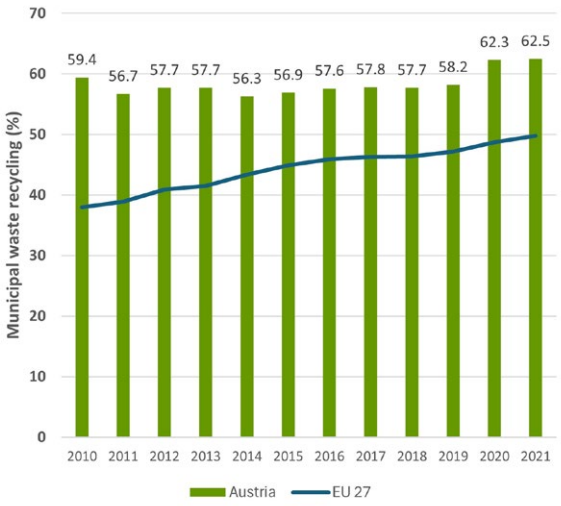
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **29%**

AMOUNT STILL TO BE CAPTURED (T): **592.127**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **68%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Door-to-door separate collection is the dominant collection system across the country, complemented with nearby collection points and civic amenity sites

EEA ASSESSMENT – SUMMARY

The bio-waste treatment capacity is well above 80% of the total generated municipal bio-waste.There are national standards for compost products including a quality management system.

BELGIUM

TOTAL POPULATION (MILLION): **11.61**

% CITIES: **27.9%**

% TOWNS AND SUBURBS: **53.6%**

% RURAL: **18.4%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **105.7**

POTENTIAL GENERATION (T): **1.227.983**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **1.043.785**

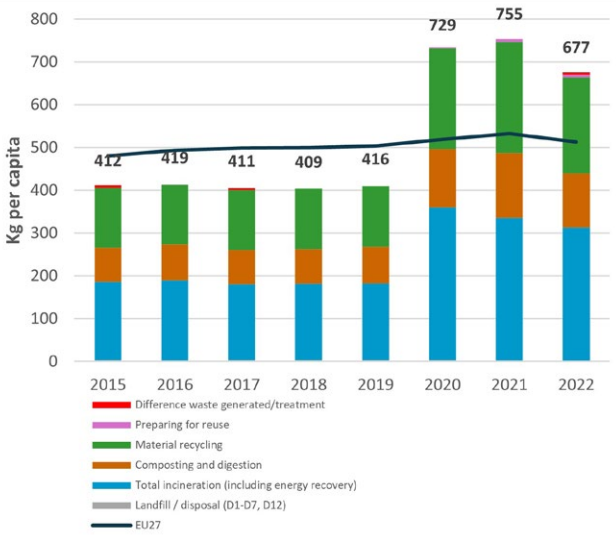
CURRENT CAPTURE (T): **353.176**

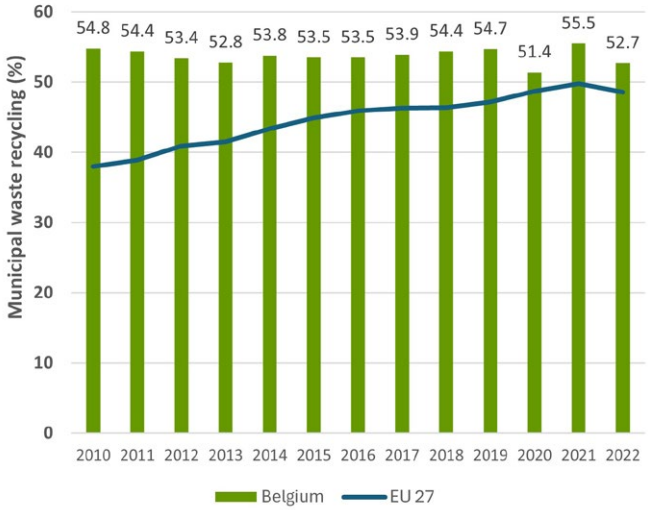
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **29%**

AMOUNT STILL TO BE CAPTURED (T): **690.610**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **63%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

In cities, bio-waste is collected door-to-door in all 3 regions. For towns and suburbs and rural areas, both the scope (food/garden waste) can be smaller than in cities, and also the convenience level is typically lower.

PLANS AND PROPOSALS:

Bio-waste collection will become compulsory in BCR in 2023,and in Flanders for all households and companies from 2024 (or composted at source), and Wallonia plans to extend food waste collection.

EEA ASSESSMENT – SUMMARY

The overall available bio-waste capacity for Belgium is estimated to be more than 80 % of the generated municipal bio-waste. However, there are significant differences between the three regions. Quality standards and a quality management system for compost/digestate are only in place in Flanders, while in Wallonia there are administrative norms that are applied on a case by case basis.

BULGARIA

TOTAL POPULATION (MILLION): **6.83**

% CITIES: **45.3%**

% TOWNS AND SUBURBS: **22.8%**

% RURAL: **31.9%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **80.2**

POTENTIAL GENERATION (T): **548.449**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **466.181**

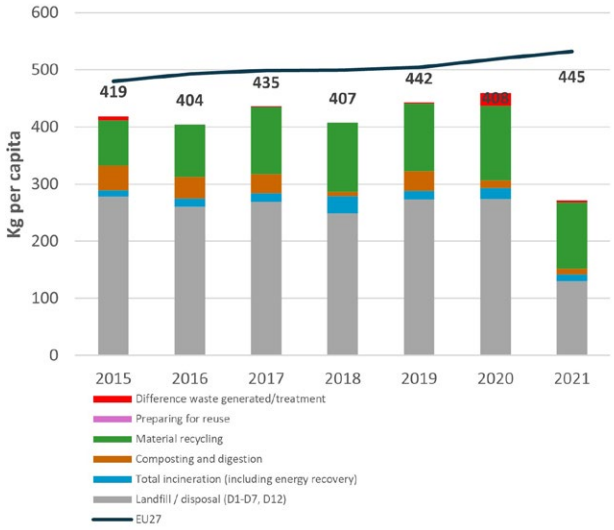
CURRENT CAPTURE (T): **-**

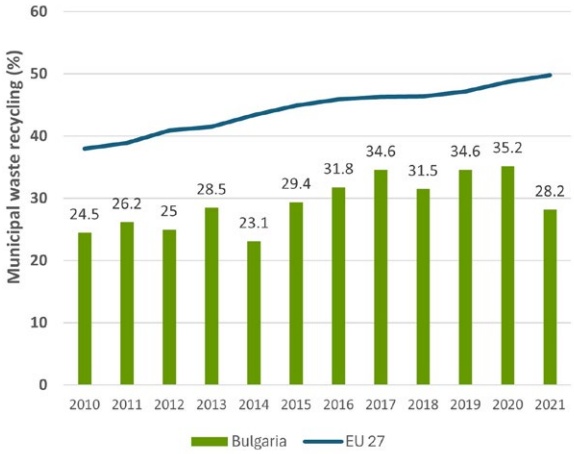
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **0%**

AMOUNT STILL TO BE CAPTURED (T): **466.181**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **5%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Low-convenience collection points are the dominant systems in cities, towns and suburbs, and rural areasfor bio-waste.

PLANS AND PROPOSALS:

Plans include the introduction of separate collection starting in the municipalities with new treatment capacities, as well as the promotion of home composting. The timing is however unclear.

EEA ASSESSMENT – SUMMARY

Separate collection of bio-waste and bio-waste management are still in its infancy in Bulgaria. There is no system in place that guarantees high-quality compost produced from separately collected bio-waste. Bulgaria has no legally binding national compost quality standards and no quality management system for compost produced from separate collected bio-waste exists in the country.

CROATIA

TOTAL POPULATION (MILLION): **3.86**

% CITIES: **29.2%**

% TOWNS AND SUBURBS: **32.3%**

% RURAL: **38.4%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **84.4**

POTENTIAL GENERATION (T): **326.088**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **277.175**

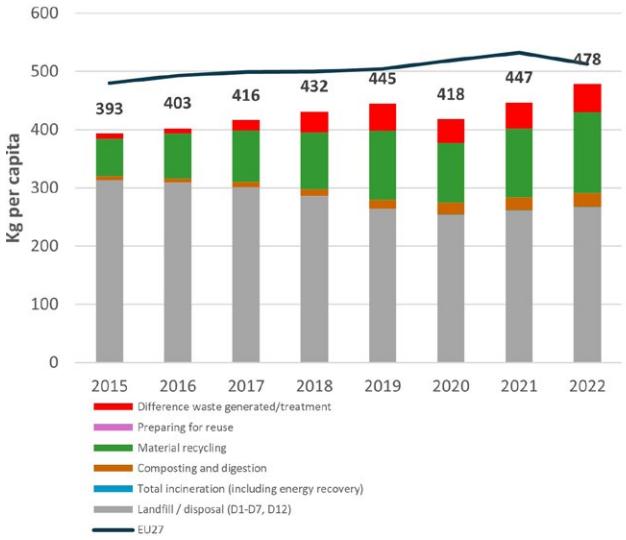
CURRENT CAPTURE (T): **18.539**

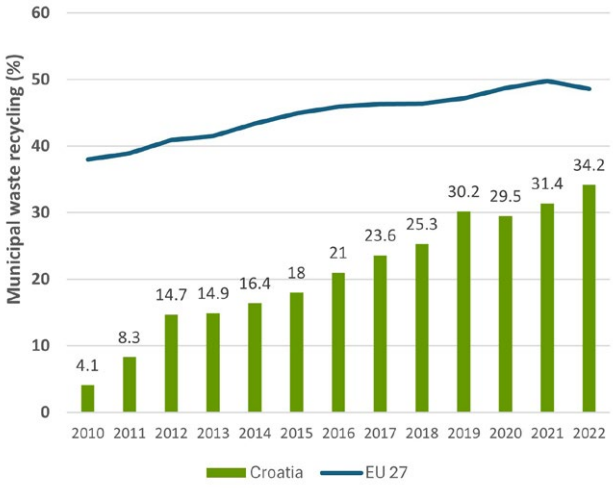
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **6%**

AMOUNT STILL TO BE CAPTURED (T): **258.636**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **11%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Door-to-door separate collection for bio-waste is the dominant system in Croatia. However, in 2019 only around 33 % of the LSGUs in Croatia collected bio-waste separately, corresponding to a low share of the population.

PLANS AND PROPOSALS:

Croatia plans to strengthen the separate collection system of bio-waste and to support composting at home to increase the recycling of bio-waste. EU cohesion funds have been allocated for the projects, but the impact on the coverage of high-quality services is unclear.

EEA ASSESSMENT – SUMMARY

The current bio-waste treatment capacity in Croatia is used for the treatment of agricultural and industrial wastes. There are plans and allocated funds for increasing the treatment capacity of municipal bio-waste. Croatia has national standards for compost/digestate quality with voluntary application for end-of-waste status, and prescribes a quality management system.

CYPRUS

TOTAL POPULATION (MILLION): **0.90**

% CITIES: **50.7%**

% TOWNS AND SUBURBS: **31.5%**

% RURAL: **17.8%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **79.8**

POTENTIAL GENERATION (T): **72.200**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **61.370**

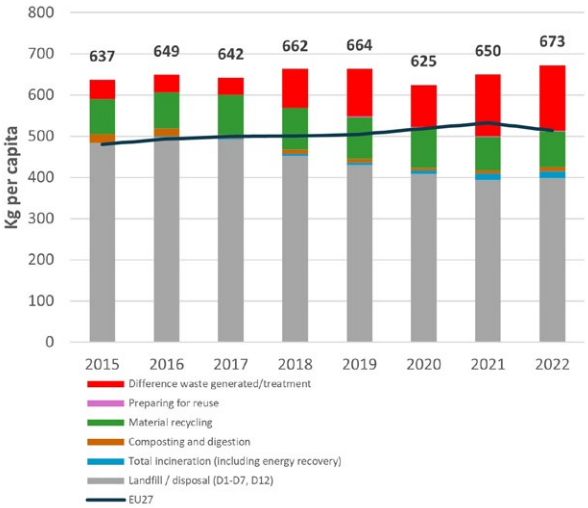
CURRENT CAPTURE (T): **1.990**

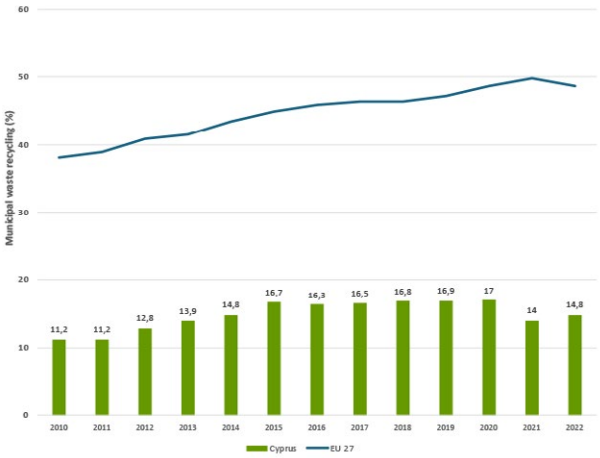
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **3%**

AMOUNT STILL TO BE CAPTURED (T): **59.379**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **9%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Food waste is not collected separately, and garden waste is only collected at bring points. This leads to low convenience level regarding bio-waste collection, as food waste is the prevailing fraction of bio-waste.

PLANS AND PROPOSALS:

Mandatory separate collection organised by municipalities was expected to be implemented from 2023 onwards. The system will cover organic waste from household and non-household sources.

EEA ASSESSMENT – SUMMARY

The available treatment capacity is not dedicated to municipal bio-waste treatment only. The Cypriot authorities are planning to increase the capacity for the treatment of bio-waste in the near future, but there are no firm plans, i.e. plans that have clear responsible entities, defined targets, and timeline available, yet. There are no national standards or quality management system for compost quality.

CZECHIA

TOTAL POPULATION (MILLION): **10.51**

% CITIES: **30.0%**

% TOWNS AND SUBURBS: **34.0%**

% RURAL: **36.0%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **93.7**

POTENTIAL GENERATION (T): **985.878**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **837.996**

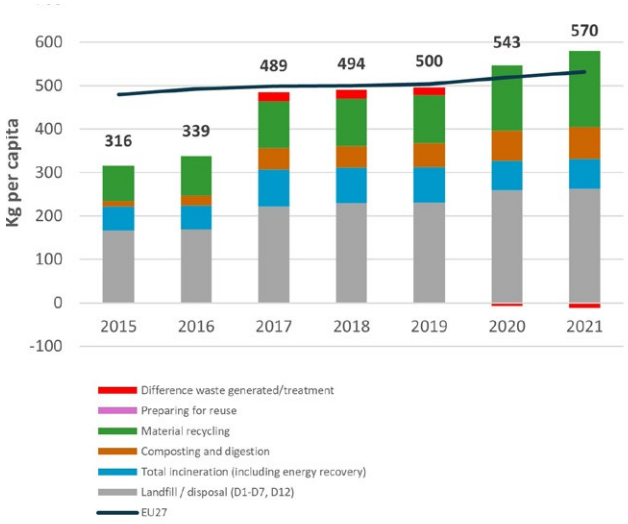
CURRENT CAPTURE (T): **153.544**

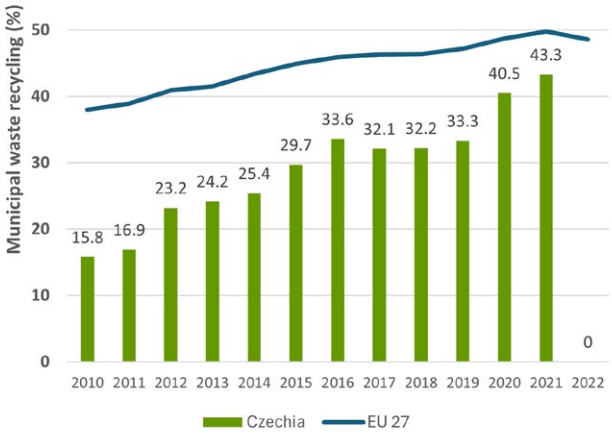
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **16%**

AMOUNT STILL TO BE CAPTURED (T): **684.453**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **31%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

For bio-waste, civic amenity sites and, to some extent, bring points are the dominant way of collection across the country. In some towns, suburbs and in rural areas there are door-to-door collection systems in place which are considered as high convenience for citizens. The collection system of bio-waste is mandatory in every municipality of the Czech Republic.

PLANS AND PROPOSALS:

According to the Czech authorities, the collection of food waste will be expanded and the plan for implementation is set out in the updated WMP. The collection will be focused on kitchen animal waste from households going to anaerobic digestion (biogas). A larger share of the population is expected to have access to higher convenience collection services.

EEA ASSESSMENT – SUMMARY

The Czech Republic has sufficient bio-waste treatment capacity available to treat nearly all municipal bio-waste but geographical distance might be an issue. There are national standards for compost quality in place, and a quality management system for each approved composting plant.

DENMARK

TOTAL POPULATION (MILLION): **5.87**

% CITIES: **32.5%**

% TOWNS AND SUBURBS: **34.2%**

% RURAL: **33.3%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **103.5**

POTENTIAL GENERATION (T): **607.899**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **516.714**

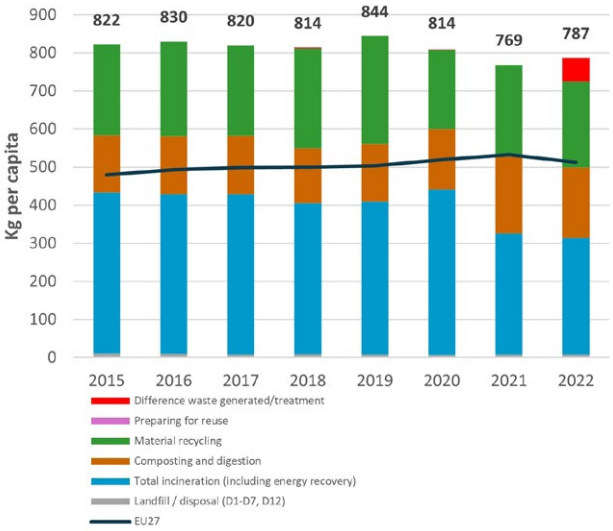
CURRENT CAPTURE (T): **296.325**

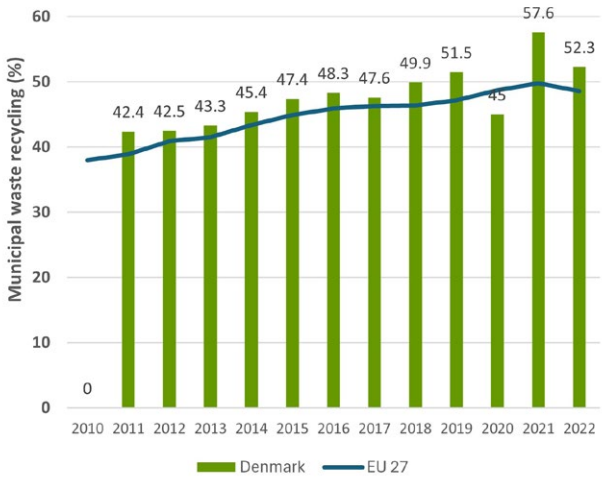
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **49%**

AMOUNT STILL TO BE CAPTURED (T): **220.390**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **93%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Denmark conducts door-to-door and high density bring point collection for food and garden waste, but not yet in all municipalities. Garden waste is additionally collected at civic amenity sites. Improvements have been expected since the end of 2022.

PLANS AND PROPOSALS:

As of July 2021, but with the option to apply for a derogation until end 2022, all municipalities in Denmark were obliged to arrange separate collection schemes (door-to-door or high convenience bring points).

EEA ASSESSMENT – SUMMARY

Increasing the bio-waste treatment capacity is required in order to meet the increasing volumes of separately collected bio-waste. The Danish authorities report the required capacity demand for the treatment of bio-waste will be covered by the private sector or the municipalities. Denmark has legally binding national standards for compost quality, but no quality management system yet.

ESTONIA

TOTAL POPULATION (MILLION): **1.33**

% CITIES: **59.9%**

% TOWNS AND SUBURBS: **8.3%**

% RURAL: **31.8%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **111.8**

POTENTIAL GENERATION (T): **148.933**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **126.593**

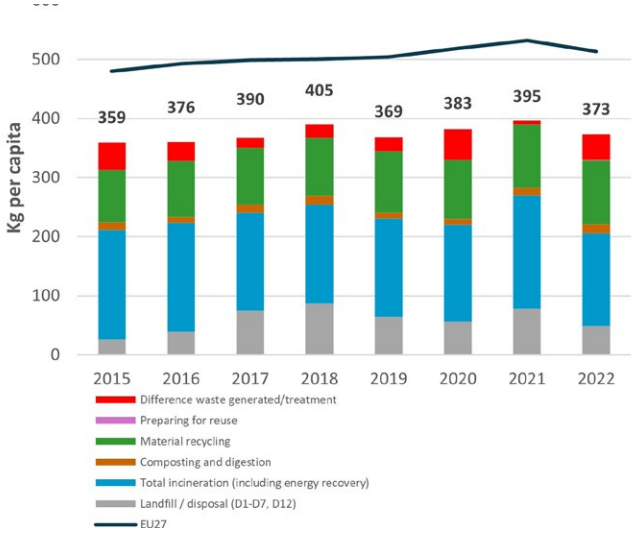
CURRENT CAPTURE (T): **3.995**

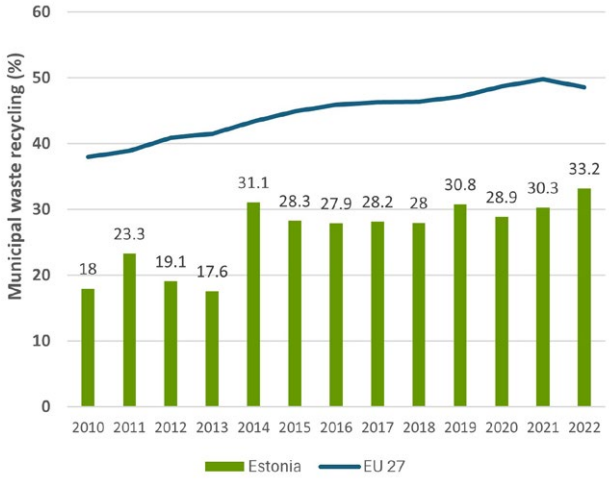
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **3%**

AMOUNT STILL TO BE CAPTURED (T): **122.598**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **7%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

For food waste, there is no dominant system in place, but door-to-door collection is available in some cities, town and suburbs. Garden waste is dominantly collected at civic amenity sites.

PLANS AND PROPOSALS:

A mandatory door-to-door collection of bio-waste (kitchen food waste) or alternatively home composting, became mandatory for all residents by the end of 2023. The coverage of the planned separate collection system is expected to exceed half of the population.

EEA ASSESSMENT – SUMMARY

The current maximum capacity is sufficient to treat around 80 % of the municipal bio-waste generated. However, the estimated capacity only includes facilities producing certified compost or digestate that meet the EoW criteria. Facilities not meeting the criteria are not included in the capacity. After the new additional capacity is available, the maximum treatment capacity will exceed 80 %. A legally binding national standard and a quality management system for compost and digestate is in place.

FINLAND

TOTAL POPULATION (MILLION): **5.54**

% CITIES: **38.9%**

% TOWNS AND SUBURBS: **32.5%**

% RURAL: **28.6%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **102.0**

POTENTIAL GENERATION (T): **565.992**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **481.093**

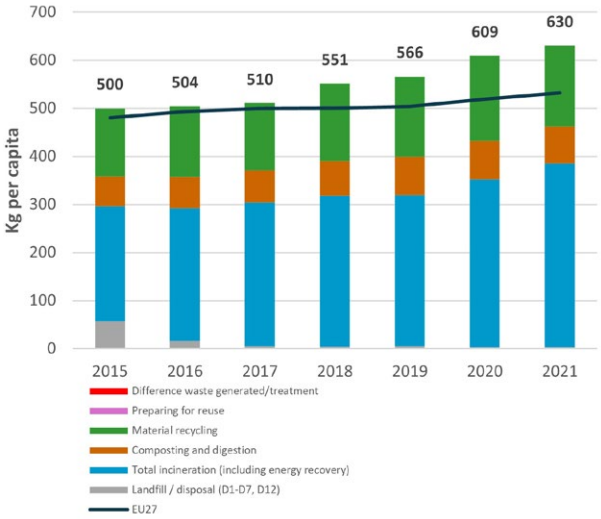
CURRENT CAPTURE (T): **85.443**

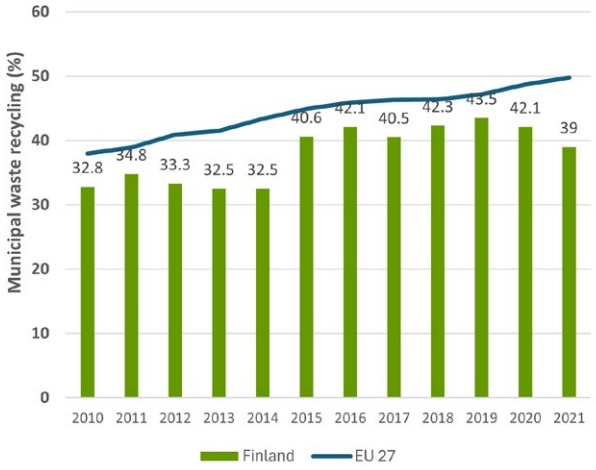
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **15%**

AMOUNT STILL TO BE CAPTURED (T): **395.650**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **34%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

For food and bio-waste, door-to-door collection is the dominant system in cities, towns and suburbs, whereas in rural areas there are no separate collection systems in place and home-composting is rather common. For garden waste, only civic amenity site collection is available, but the share of garden waste is low compared to food waste (only around 14 % of all bio-waste generated).

PLANS AND PROPOSALS:

As of July 2024, municipalities had to extend door-to-door collection of bio-waste to all housing properties located in population centres with more than 10 000 inhabitants.

EEA ASSESSMENT – SUMMARY

The available treatment capacity is not dedicated to municipal bio-waste treatment only, and therefore the sufficiency of the current capacity to treat generated municipal bio-waste cannot be estimated. However, new treatment plants are under construction (with some completed). The Ministry of the Environment estimates these investments are sufficient to treat approx. 7080 % of the total bio-waste generated, corresponding to the expected amount of separately collected waste after the extension of separate collection. A legally binding national standard and a quality management system for compost/ digestate is in place.

FRANCE

TOTAL POPULATION (MILLION): **67.95**

% CITIES: **47.6%**

% TOWNS AND SUBURBS: **19.3%**

% RURAL: **33.1%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **122.3**

POTENTIAL GENERATION (T): **8.313.315**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **7.066.318**

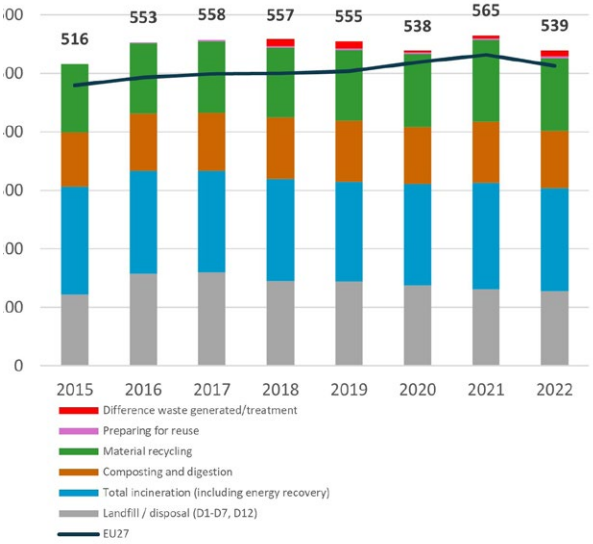
CURRENT CAPTURE (T): **1.413.507**

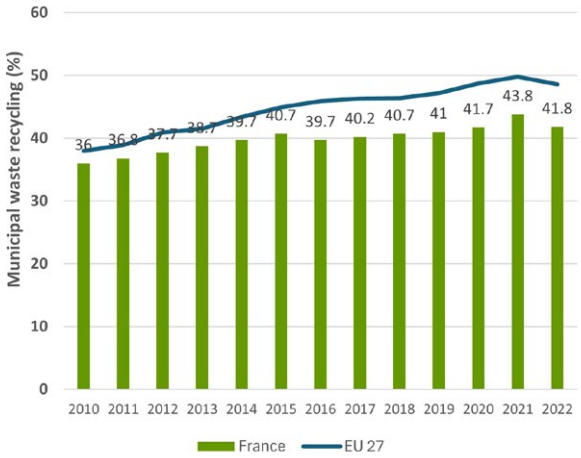
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **17%**

AMOUNT STILL TO BE CAPTURED (T): **5.652.811**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **44%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

The separate collection of bio-waste is not common in France. In 2018, it was estimated that only 9% of the population was covered by this kind of collection.

PLANS AND PROPOSALS:

Bio-waste separate collection will become mandatory by 2024. The choice of technical solutions for the local management and separate collection of bio-waste is left to local authorities with substantial support provided by the central authorities.

EEA ASSESSMENT – SUMMARY

No exact capacity information is available, but it is estimated that a treatment capacity for around 60 % of generated bio-waste is available. France reported having mature national standards for compost quality embedded in national legislation and a quality management system in place.

GERMANY

TOTAL POPULATION (MILLION): **83.23**

% CITIES: **36.3%**

% TOWNS AND SUBURBS: **40.7%**

% RURAL: **23.0%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **94.4**

POTENTIAL GENERATION (T): **7.834.000**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **6.658.900**

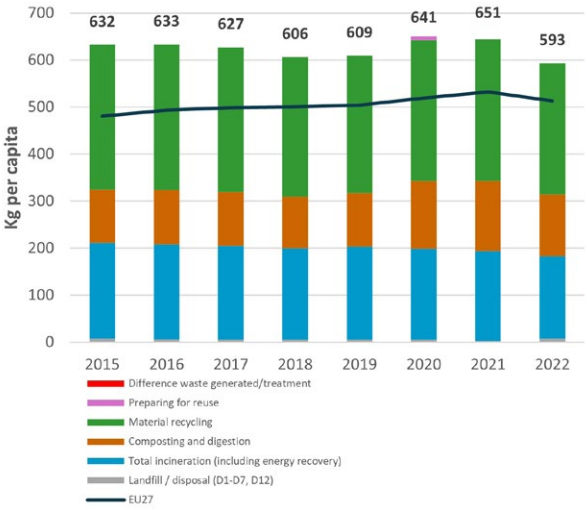
CURRENT CAPTURE (T): **2.480.466**

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **32%**

AMOUNT STILL TO BE CAPTURED (T): **4.178.434**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **68%**



Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

For bio-waste, door-to-door separate collection is the dominant system in cities, towns and suburbs, and rural areas. Garden waste, representing 50 % of bio-waste in Germany, is both collected door-to-door together with food waste, seasonally separately as garden waste, and via civic amenity sites.

PLANS AND PROPOSALS:

Attempts are being made at federal and state level to expand organic waste collection, but the decision must be made at the municipal level.

EEA ASSESSMENT – SUMMARY

The bio-waste treatment capacity is estimated to be sufficient. Mature national standards for compost/digestate quality and a quality management system are in place.

GREECE

TOTAL POPULATION (MILLION): **10.45**

% CITIES: **39.6%**

% TOWNS AND SUBURBS: **30.9%**

% RURAL: **29.4%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **142.7**

POTENTIAL GENERATION (T): **1.492.849**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **1.268.922**

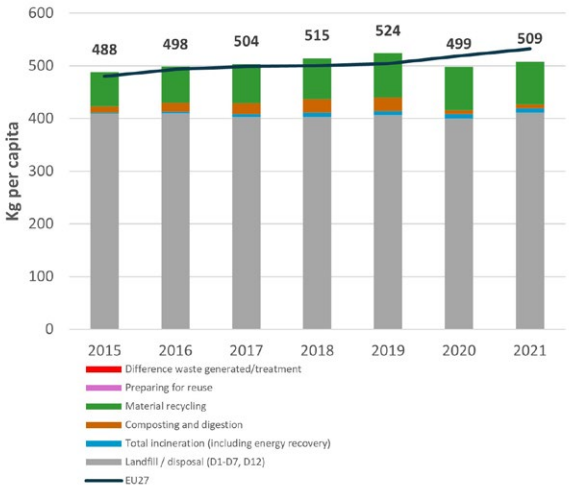
CURRENT CAPTURE (T): **16.736**

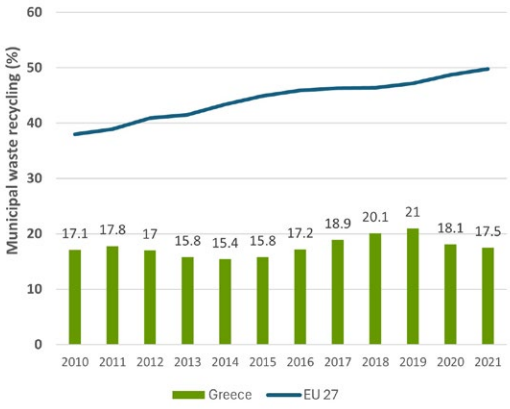
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **1%**

AMOUNT STILL TO BE CAPTURED (T): **1.252.186**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **4%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Only garden waste is separately collected in cities, towns and suburbs, but in rural areas, no separate collection of bio-waste is provided.

PLANS AND PROPOSALS:

Universal collection by the end of 2022 was supposed to be introduced by municipalities, and extension of the separate collection obligation for non-household waste.

EEA ASSESSMENT – SUMMARY

The current bio-waste treatment capacity is insufficient. There are plans to increase the capacity of bio-waste treatment but the planned treatment capacity would only be sufficient for treating 30 % of the total bio-waste generation. There are national standards but yet no quality management system for compost quality.

HUNGARY

TOTAL POPULATION (MILLION): **9.68**

% CITIES: **32.8%**

% TOWNS AND SUBURBS: **34.2%**

% RURAL: **33.0%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **110.0**

POTENTIAL GENERATION (T): **1.065.908**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **906.022**

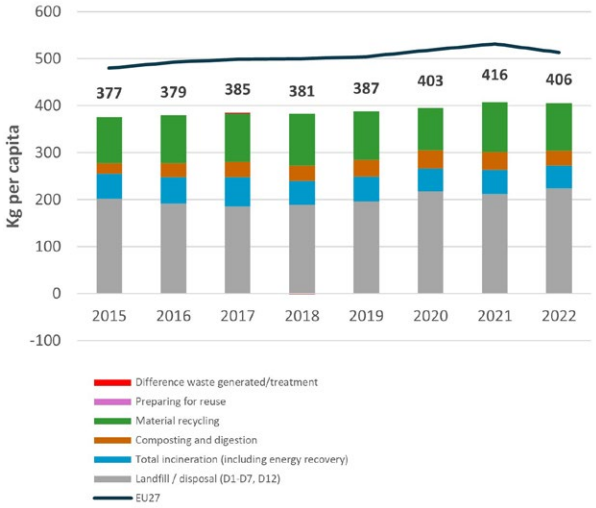
CURRENT CAPTURE (T): **75.574**

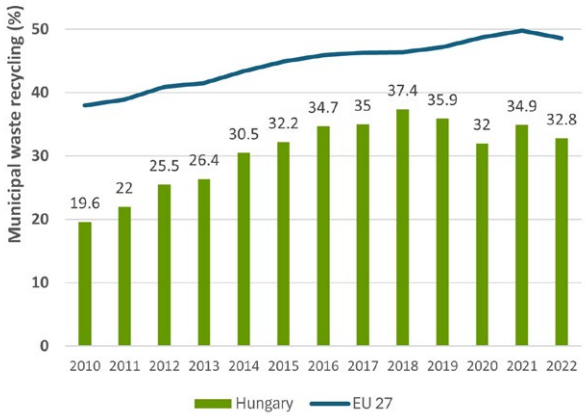
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **7%**

AMOUNT STILL TO BE CAPTURED (T): **830.448**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **16%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

For food waste, no separate collection exists. For garden waste, door-to-door collection is the dominant system in cities, towns and suburbs, and rural areas. However, the share of garden waste is low compared to food waste, and the lack of separate collection for food waste results in low convenience level.

PLANS AND PROPOSALS:

Although there is an intention to further develop the separate collection, firm plans, i.e. plans that have clear responsible entities and defined targets and timeline, are not yet in place.

EEA ASSESSMENT – SUMMARY

Nominally, the available treatment capacity should be able to absorb all generated municipal bio-waste. However, there is no information about the current use of the existing capacities and how much of it will actually be available for the treatment of separately collected bio-waste once separate collection of bio-waste is introduced. There is no quality standard for compost and the implementation of a quality management system for the production of compost from bio-waste has not yet started.

IRELAND

TOTAL POPULATION (MILLION): **5.06**

% CITIES: **46.3%**

% TOWNS AND SUBURBS: **22.3%**

% RURAL: **31.4%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **118.2**

POTENTIAL GENERATION (T): **598.032**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **508.327**

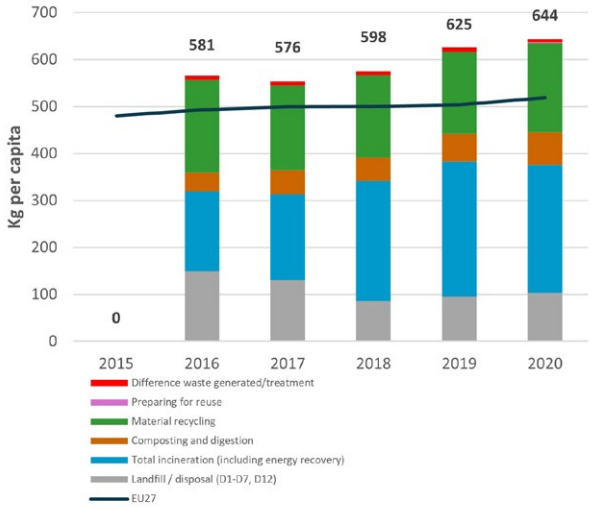
CURRENT CAPTURE (T): **66.400**

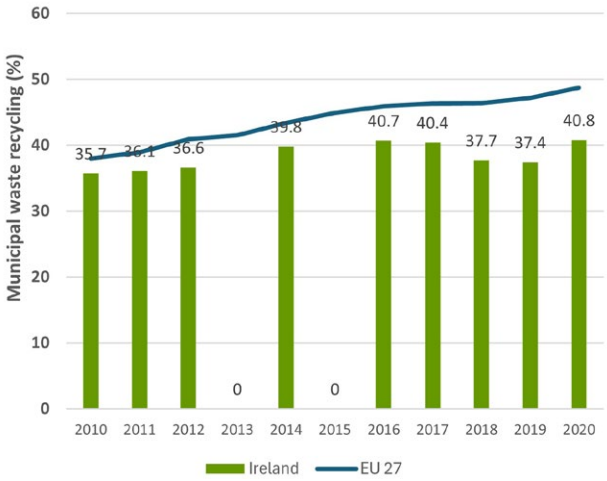
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **11%**

AMOUNT STILL TO BE CAPTURED (T): **441.927**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **28%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Door-to-door separate collection systems for bio-waste are in place across the country, except for rural and semi-rural areas. Bio-waste can also be dropped off at civic amenity sites across the whole country.

PLANS AND PROPOSALS:

Ireland's Waste Action Plan for a Circular Economy commits to expanding brown bin collection, and introducing segregation in commercial sector. A Food Waste Recycling Working Group has been established to improve household food waste segregation and awareness in Ireland. A Food Waste Recycling Pilot Project was published in 2020.

EEA ASSESSMENT – SUMMARY

At present, about 34 % of the organic fraction of MSW generated in Ireland is separately collected. However, bio-waste accounts for 23 % of the total volume of mixed residual waste collected, and spare capacity could treat only about 20% of the bio-waste currently within the mixed MSW. There are legally binding standards for compost/digestate quality in place as well as a quality management system.

ITALY

TOTAL POPULATION (MILLION): **59.03**

% CITIES: **34.3%**

% TOWNS AND SUBURBS: **41.2%**

% RURAL: **24.5%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **127.7**

POTENTIAL GENERATION (T): **7.537.688**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **6.407.034**

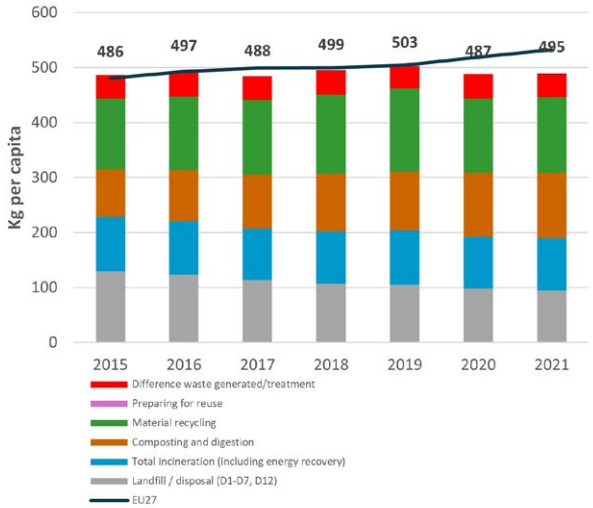
CURRENT CAPTURE (T): **5.456.950**

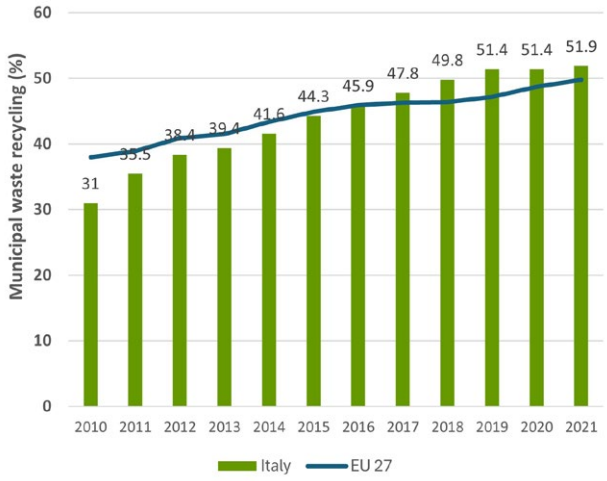
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **72%**

AMOUNT STILL TO BE CAPTURED (T): **950.084**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **70%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Food and garden waste are mainly collected at bring points. Food waste is also collected door-to-door, and garden waste at civic amenity sites.However, only a medium share of the population is covered by door-to-door collection, which is the only system considered as high convenience.

PLANS AND PROPOSALS:

It is noted that several regions may have included objectives, plans and measures related to bio-waste in their regional Waste Management Plans (e.g. Lazio, Sicily), but no countrywide inventory of bio-waste related measures included in regional plans is available.

EEA ASSESSMENT – SUMMARY

In 2019, at the national level, Italy had sufficient bio-waste treatment capacity to treat all generated municipal bio-waste. Regional deficits with respect to bio-waste treatment capacity would however render the realisation of such ambition impracticable. Legally binding compost standards are set in the Legislative Decree on Fertilizers D.Lgs 75/2010 and subsequent amendments, consider both agronomical and environmental parameters. A mature compost quality management system is in place.

LATVIA

TOTAL POPULATION (MILLION): **1.85**

% CITIES: **43.4%**

% TOWNS AND SUBURBS: **19.4%**

% RURAL: **37.2%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **107.4**

POTENTIAL GENERATION (T): **201.395**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **171.186**

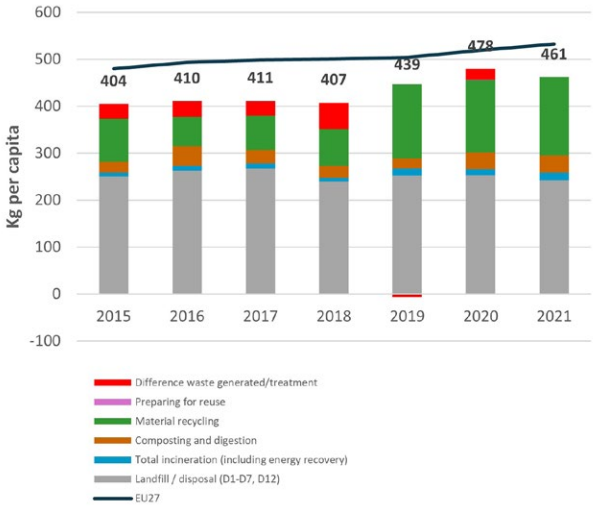
CURRENT CAPTURE (T): **13.881**

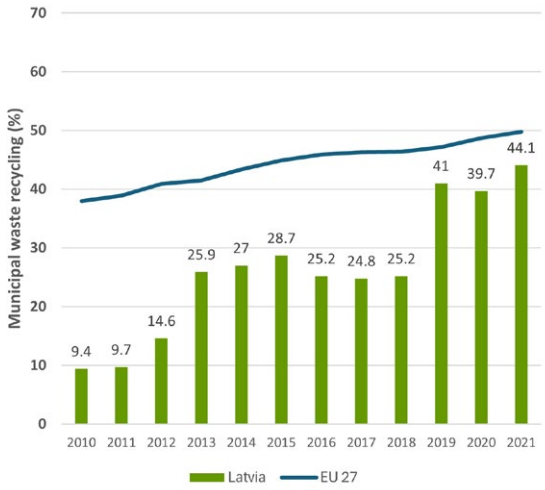
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **7%**

AMOUNT STILL TO BE CAPTURED (T): **157.305**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **16%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Only a few municipalities have introduced separate collection for bio-waste so far, mainly using bring points.

PLANS AND PROPOSALS:

Latvia plans to introduce door-to-door collection of bio-waste, but the planned collection system is unclear.

EEA ASSESSMENT – SUMMARY

Bio-waste treatment capacity is high and currently partly used also for the biological output from MBT. The capacity surpasses the total bio-waste generation.

LITHUANIA

TOTAL POPULATION (MILLION): **2.80**

% CITIES: **43.5%**

% TOWNS AND SUBURBS: **2.3%**

% RURAL: **54.3%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **121.4**

POTENTIAL GENERATION (T): **340.652**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **289.554**

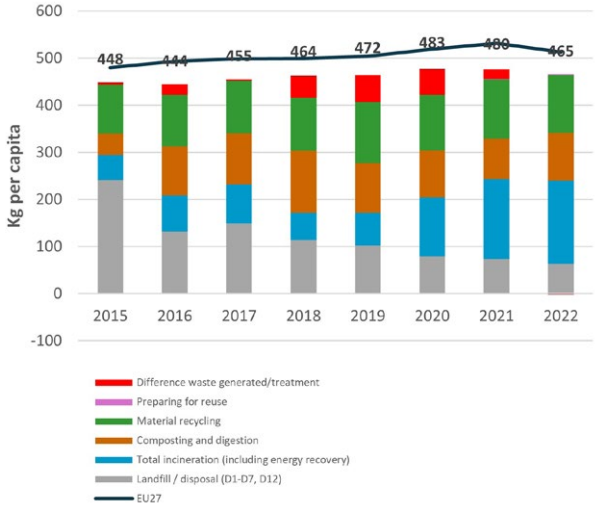
CURRENT CAPTURE (T): **57.242**

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **17%**

AMOUNT STILL TO BE CAPTURED (T): **232.311**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **41%**



Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Food waste collection is not yet common in Lithuania, but door-to-door collection has started. Garden waste is collected mainly at civic amenity sites.

PLANS AND PROPOSALS:

Lithuania indicated plans to introduce separate collection of bio-waste by 2023, while the collection focused on garden waste. However, the concrete implementation of these plans is unclear.

EEA ASSESSMENT – SUMMARY

Bio-waste treatment capacity is high and currently partly used also for the biological output from MBT. The capacity surpasses the total bio-waste generation.

LUXEMBOURG

TOTAL POPULATION (MILLION): **0.64**

% CITIES: **15.1%**

% TOWNS AND SUBURBS: **43.7%**

% RURAL: **41.2%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **118.3**

POTENTIAL GENERATION (T): **76.363**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **64.909**

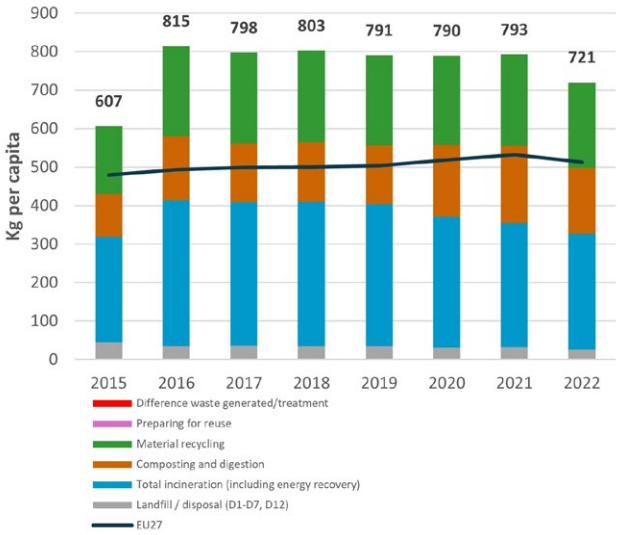
CURRENT CAPTURE (T): **25.816**

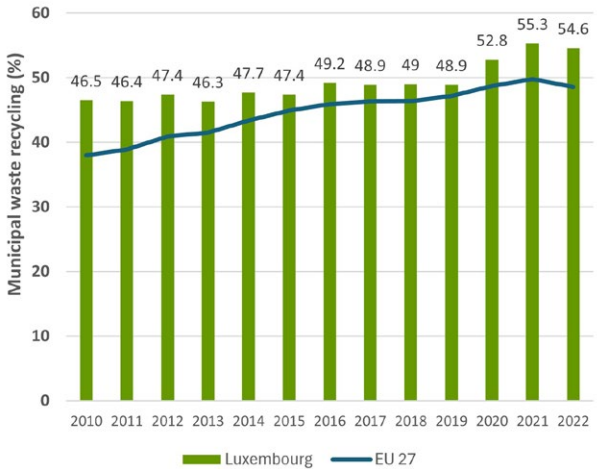
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **34%**

AMOUNT STILL TO BE CAPTURED (T): **39.093**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **72%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Door-to-door separate collection is the dominant systems in cities, towns and suburbs, and rural areas for bio-waste. In addition, bio-waste is collected at civic amenity sites. For garden waste there are also bring points.

PLANS AND PROPOSALS:

A high share of the population is already covered by high convenience collection services.

EEA ASSESSMENT – SUMMARY

Bio-waste treatment capacity is considered sufficient, namely above 80 % of total generated municipal bio-waste. Luxembourg has mature national standards for compost quality, compost is quality assured.

MALTA

TOTAL POPULATION (MILLION): **0.52**

% CITIES: **89.8%**

% TOWNS AND SUBURBS: **10.0%**

% RURAL: **0.2%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **113.3**

POTENTIAL GENERATION (T): **59.041**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **50.185**

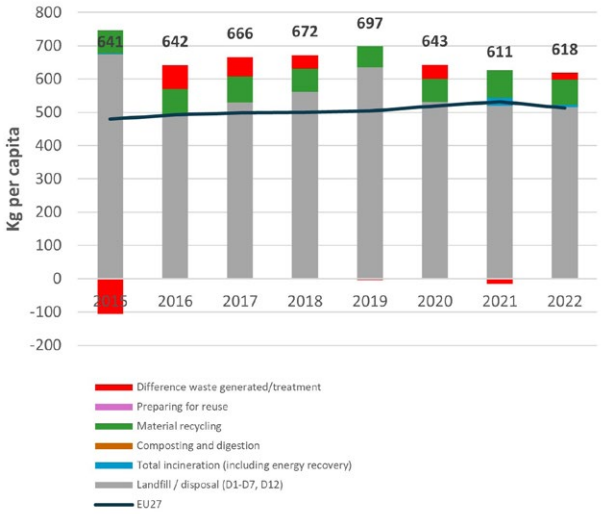
CURRENT CAPTURE (T): **22.589**

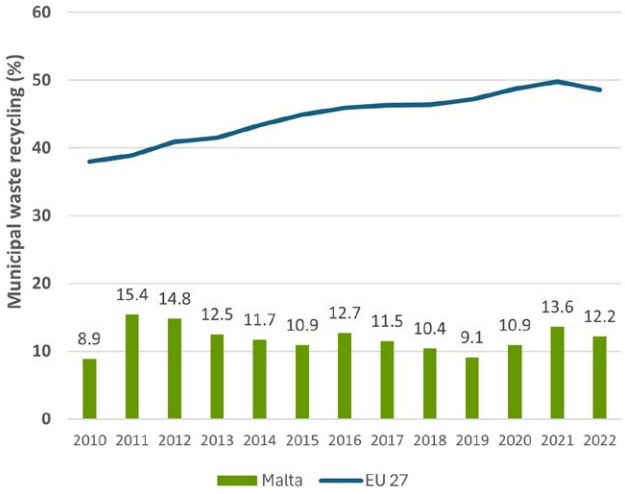
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **38%**

AMOUNT STILL TO BE CAPTURED (T): **27.596**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **41%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Bio-waste (food and garden waste together) is collected through door-to-door separate collection, providing a convenient system for citizens. Additionally, garden waste is collected at civic amenity sites.

PLANS AND PROPOSALS:

The NWMP 2021-2030 covering the period 2021-2030 envisaged mandatory separation of bio-waste from all households and commercial establishments as of 2022.

EEA ASSESSMENT – SUMMARY

Bio-waste treatment capacity is high and it is not all in use. The capacities surpass the total bio-waste generation. Malta has neither legally binding national standards for compost/digestate quality in place, nor a quality management system, but plans to introduce these once the new organic processing plant is in place.

NETHERLANDS

TOTAL POPULATION (MILLION): **17.59**

% CITIES: **56.4%**

% TOWNS AND SUBURBS: **33.0%**

% RURAL: **10.7%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **111.8**

POTENTIAL GENERATION (T): **1.967.362**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **1.672.258**

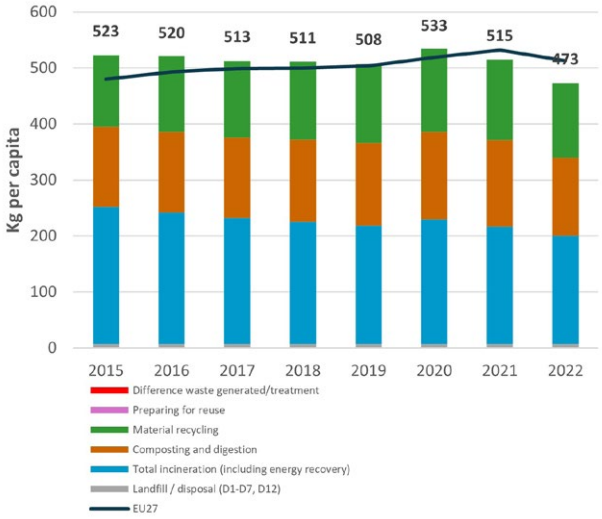
CURRENT CAPTURE (T): **541.793**

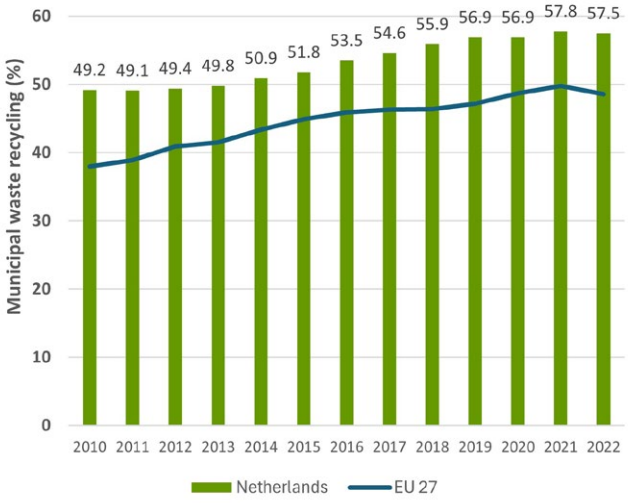
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **28%**

AMOUNT STILL TO BE CAPTURED (T): **1.130.465**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **74%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

The dominant collection system all over the country for bio-waste is door-to-door separate collection.

PLANS AND PROPOSALS:

A high share of the population is covered by high convenience collection services, and there are firm plans to extend separate collection to the whole population, including high-rise buildings which were exempted in 2019-2020.

EEA ASSESSMENT – SUMMARY

In theory, the Netherlands has more than enough capacity to treat all generated bio-waste.

NORWAY

TOTAL POPULATION (MILLION): **5.42**

% CITIES: **29.1%**

% TOWNS AND SUBURBS: **39.4%**

% RURAL: **31.5%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **78.8**

POTENTIAL GENERATION (T): **427.511**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **363.385**

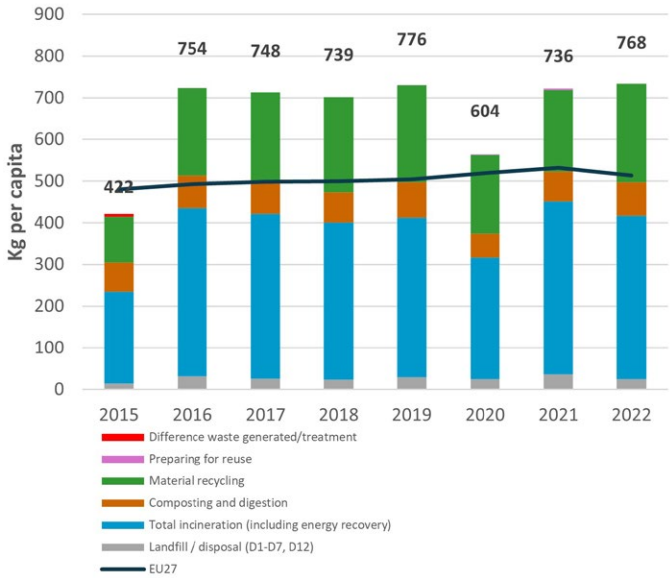
CURRENT CAPTURE (T): **238.712**

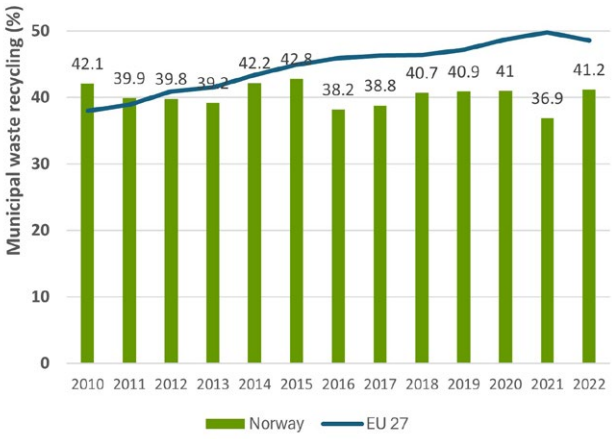
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **56%**

AMOUNT STILL TO BE CAPTURED (T): **124.673**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **37%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Food waste in Norway is at 75 kg per capita and year (2020), out of which 40% is from households. 70% of the households can separate out food waste.
In denser cities, the collection of food waste with optical sorting systems is experiencing low quality issues, so some municipalities surrounding Oslo (about 200,000 inhabitants) from 1st Jan 2023 shifted from the optibag system for bio-waste to the traditional separate collection.
Food waste is used in Norway for biogas production and compost, where the latter is used as fertilizer in agriculture.

PLANS AND PROPOSALS:

Landfilling with biogenic waste became illegal in 2009.
Municipalities must achieve 70% recycling of food waste by 2035. The recent waste management strategy for Oslo sets a target of 55% captured food waste, quality improvement, and suggests a reduced collection frequency for residual waste.

POLAND

TOTAL POPULATION (MILLION): **37.65**

% CITIES: **34.4%**

% TOWNS AND SUBURBS: **24.4%**

% RURAL: **41.1%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **112.0**

POTENTIAL GENERATION (T): **4.216.206**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **3.583.775**

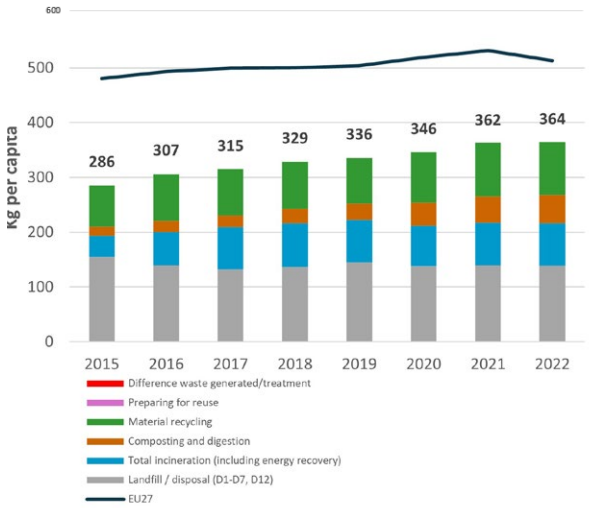
CURRENT CAPTURE (T): **391.604**

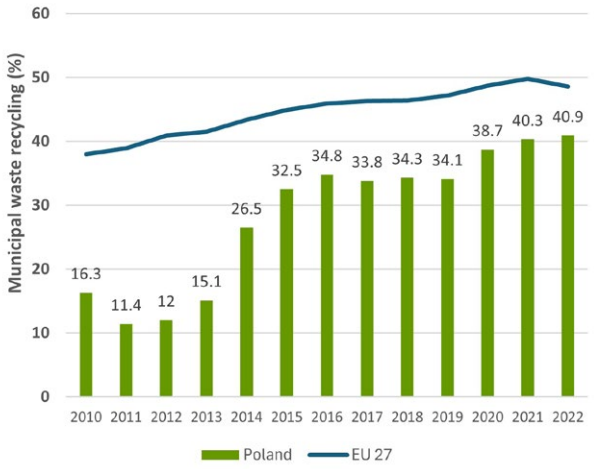
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **9%**

AMOUNT STILL TO BE CAPTURED (T): **3.192.171**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **21%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Door-to-door collection is the dominant system.

PLANS AND PROPOSALS:

A high share of the population is already covered by high convenience collection services.

EEA ASSESSMENT – SUMMARY

Bio-waste treatment capacity is significantly below 80 % of total generated municipal bio-waste. There are national standards for compost quality in place, but no quality management system exists.

PORTUGAL

TOTAL POPULATION (MILLION): **10.35**

% CITIES: **44.5%**

% TOWNS AND SUBURBS: **29.4%**

% RURAL: **26.1%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **127.2**

POTENTIAL GENERATION (T): **1.317.010**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **2.066.814**

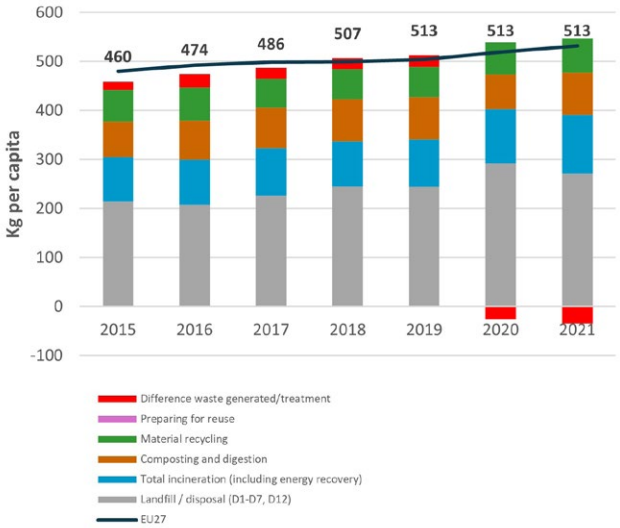
CURRENT CAPTURE (T): **57.127**

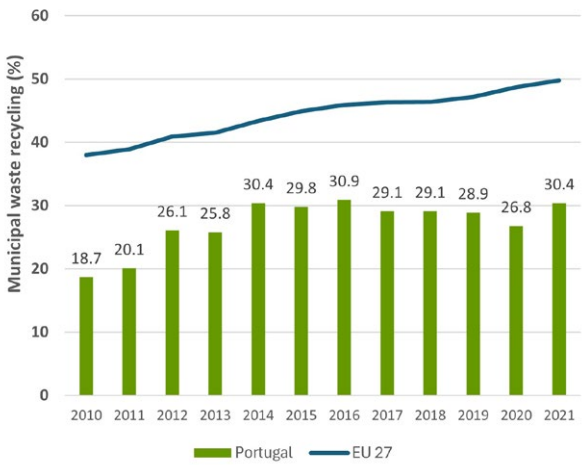
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **14%**

AMOUNT STILL TO BE CAPTURED (T): **941.403**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **35%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

For food waste, door-to-door collection is limited to some city neighbourhoods, to restaurants and bigger waste producers. In towns, suburbs, and rural areas there are no separate collection systems in place. For garden waste, door-to-door collection upon request is the dominant system in cities and towns and suburbs and there are low convenience collection points in use.

PLANS AND PROPOSALS:

Separate collection or recycling at source became mandatory by the end of 2023. Smaller catering and industrial activities had to separate bio-waste by the end of 2022 and larger operations, by end of 2023.

EEA ASSESSMENT – SUMMARY

The bio-waste treatment capacity is below 80 % of total generated municipal bio-waste. This would require 1.52 million tonnes of waste, while currently only a capacity of 130 000 tonnes is available in Portugal.

ROMANIA

TOTAL POPULATION (MILLION): **19,42**

% CITIES: **28,9%**

% TOWNS AND SUBURBS: **25,4%**

% RURAL: **45,7%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **127,7**

POTENTIAL GENERATION (T): **2.431.546**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **2.066.814**

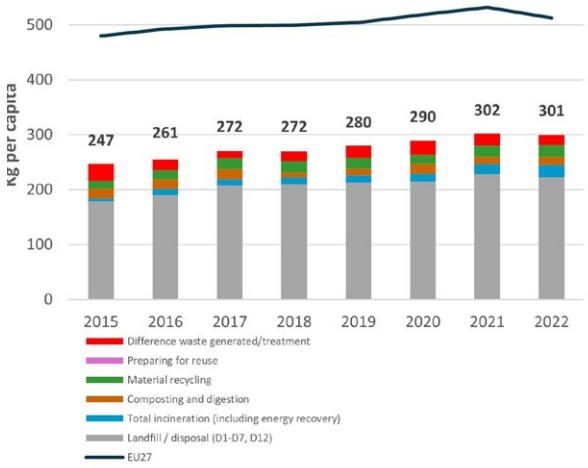
CURRENT CAPTURE (T): **57.127**

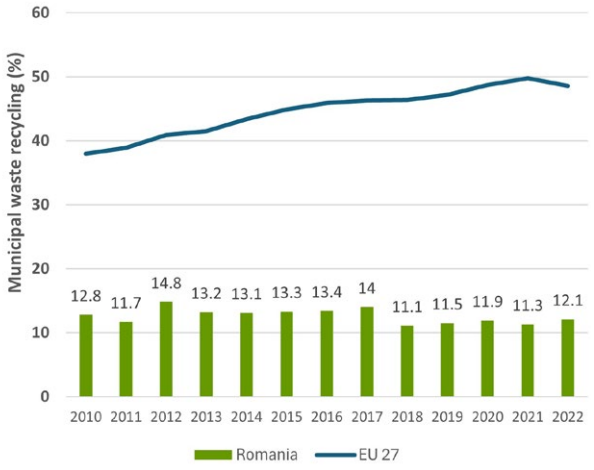
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **2%**

AMOUNT STILL TO BE CAPTURED (T): **2.009.687**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **6%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Detailed information is not available on the degree of service for separate collection of this waste stream.

PLANS AND PROPOSALS:

Romania has firm plans to increase separate collection services for at least bio-waste, wood, WEEE, paper, metal, plastic and glass waste.

EEA ASSESSMENT – SUMMARY

Romania lacks capacity for the proper treatment of bio-waste. However, investments in anaerobic digestion and composting capacity for bio-waste are planned. Romania has currently no legally binding national compost quality standards and no quality management system for compost produced from separately collected bio-waste. However, national quality standards (technical rules on composting and anaerobic digestion) are being developed.

SLOVAKIA

TOTAL POPULATION (MILLION): **5.43**

% CITIES: **22.0%**

% TOWNS AND SUBURBS: **36.4%**

% RURAL: **41.6%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **84.4**

POTENTIAL GENERATION (T): **458.844**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **390.017**

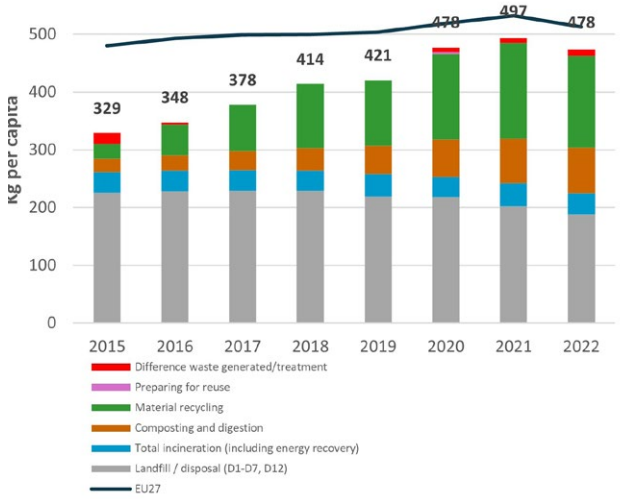
CURRENT CAPTURE (T): **85.868**

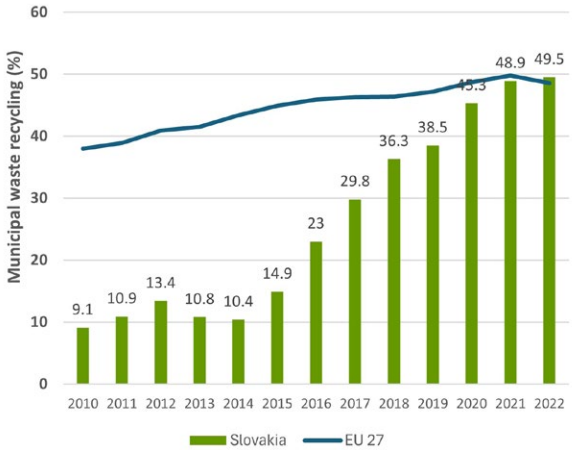
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **19%**

AMOUNT STILL TO BE CAPTURED (T): **304.149**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **34%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Door-to-door separate collection of food waste exists in towns and suburbs, and in rural areas, but not as the dominant system. In 2020, only 2 579 tonnes of household food waste were separately collected. Most of the collection methods used for garden waste represent low convenience level.

PLANS AND PROPOSALS:

The National Waste Management Plan targets a reduction with 25 % of the share of biodegradable municipal waste towards 2025, proposes measures to achieve that target, and identifies responsible entities. The measures include legal initiatives aiming for improved bio-waste collection services and coverage, as well as awareness raising campaigns, and support for increasing composting capacity.

EEA ASSESSMENT – SUMMARY

The available treatment capacity is not dedicated to municipal bio-waste treatment only. The Slovak authorities are planning to increase the capacity for the treatment of bio-waste in the future, but there are no firm plans available yet. There is no national standard nor quality management system for compost quality.

SLOVENIA

TOTAL POPULATION (MILLION): **2.10**

% CITIES: **19.3%**

% TOWNS AND SUBURBS: **35.1%**

% RURAL: **45.7%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **108.4**

POTENTIAL GENERATION (T): **228.368**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **194.113**

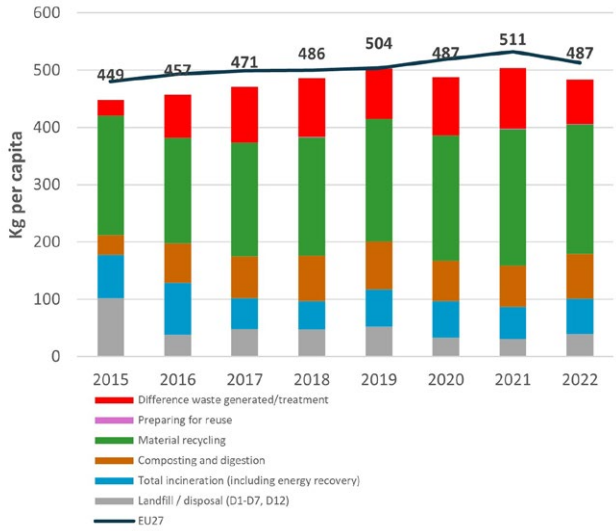
CURRENT CAPTURE (T): **32.872**

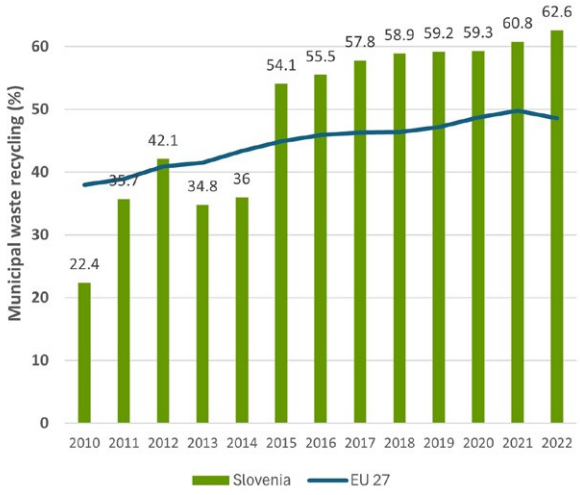
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **14%**

AMOUNT STILL TO BE CAPTURED (T): **161.241**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **30%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Bio-waste (food and garden waste together) is collected through door-to-door separate collection, providing a convenient system for citizens.

PLANS AND PROPOSALS:

A high share of the population is already covered by high convenience collection services

EEA ASSESSMENT – SUMMARY

Bio-waste treatment capacity is high and it is not all in use. The capacities surpass the total bio-waste generation. Legally binding national standards for compost/digestate quality are in place, and there is also a quality management system for compost/digestate.

SPAIN

TOTAL POPULATION (MILLION): **47.43**

% CITIES: **50.7%**

% TOWNS AND SUBURBS: **23.4%**

% RURAL: **25.9%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **144.0**

POTENTIAL GENERATION (T): **6.830.337**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **5.805.786**

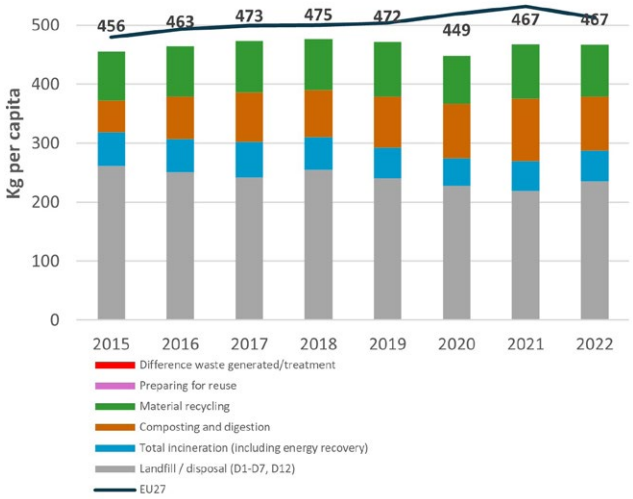
CURRENT CAPTURE (T): **996.091**

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **15%**

AMOUNT STILL TO BE CAPTURED (T): **4.809.695**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **56%**



Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

Door-to-door separate collection of bio-waste is mainly limited to some towns and suburbs in areas of intermediate population density.

PLANS AND PROPOSALS:

A dedicated budget has been made available for implementation of new separate collection systems, especially bio-waste, and improvement of existing ones. With respect to bio-waste, coverage is mandatory for municipalities with more than 5 000 inhabitants as of 30 June 2022, and was nationwide as of 31 December 2023, as required by the Waste Framework Directive, but there are no specific requirements with respect to the character of the system.

EEA ASSESSMENT – SUMMARY

If the separate collection of organic waste could be increased substantially over the next years, there seems to be a considerable lack of capacity to treat a significant part of the 8.3 million tons of potentially generated bio-waste that is currently being collected as part of the residual, mixed MSW. A more comprehensive assessment of the corresponding needs would require the provision of additional quantitative information on existing, planned or projected bio-waste treatment capacity. Through the 2021 Recovery and Resilience Plan for Spain, earmarked funding has been made available for extending treatment capacity for bio-waste.

SWEDEN

TOTAL POPULATION (MILLION): **10.45**

% CITIES: **39.9%**

% TOWNS AND SUBURBS: **40.3%**

% RURAL: **19.8%**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **YES**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **105.7**

POTENTIAL GENERATION (T): **1.104.841**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **939.115**

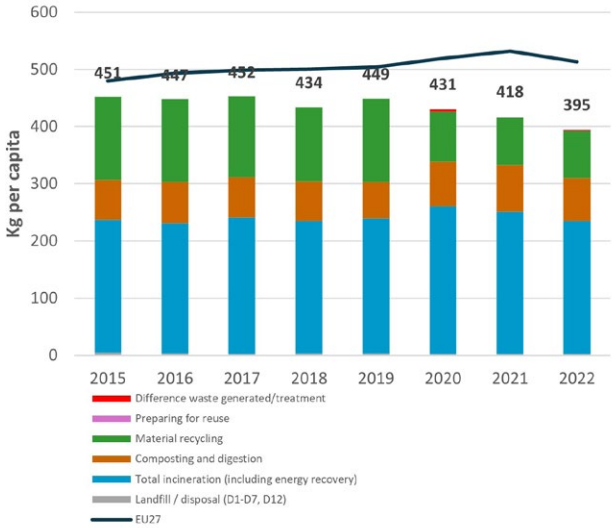
CURRENT CAPTURE (T): **171.418**

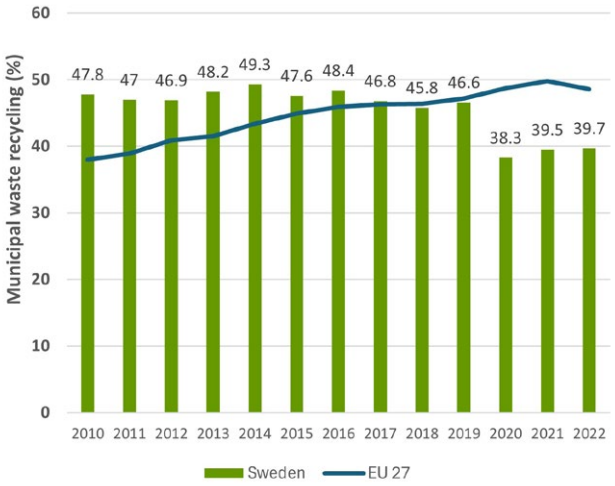
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **16%**

AMOUNT STILL TO BE CAPTURED (T): **767.697**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **36%**





Source: EC Environmental legislation implementation assessment, national reports 2022

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

For food waste, door-to-door collection is the dominant system across the country. For garden waste, civic amenity sites are the dominating system.

EEA ASSESSMENT – SUMMARY

There is a significant overcapacity for bio-waste treatment in Sweden. It remains unclear how much capacity is available for municipal separately collected bio-waste since the available capacity also covers waste from the food industry. However, although the capacity is not only dedicated to municipal bio-waste, there is enough overcapacity to conclude that Sweden will not face capacity issues if the separate collection of bio-waste increases in the future. Sweden has legally binding national standards for compost quality, and a voluntary quality assurance system in place that most treatment plants comply with.

UNITED KINGDOM

TOTAL POPULATION (MILLION): **67.59**

% CITIES: **59.3%**

% TOWNS AND SUBURBS: **27.9**

% RURAL: **12.8**

RECEIVED 2023 EARLY WARNING REPORT ON MSW TARGETS: **NO**

FOOD WASTE

POTENTIAL GENERATION (KG/CAPITA): **118.1**

POTENTIAL GENERATION (T): **7.985.764**

POTENTIAL MAXIMUM CAPTURE WITH OPTIMISED COLLECTION SCHEMES (T): **6.787.900**

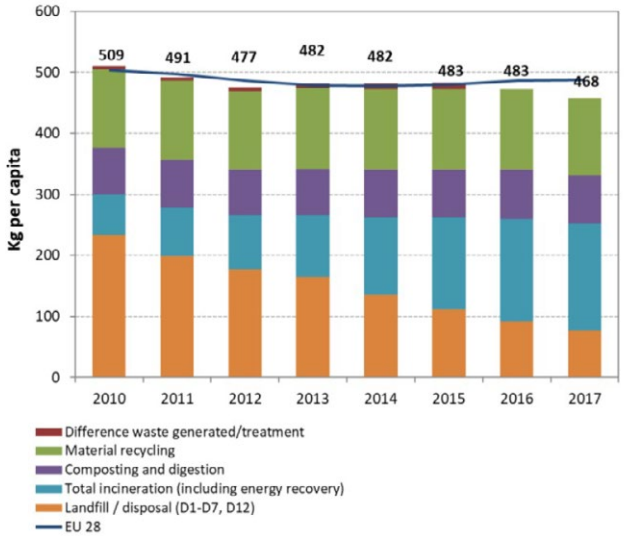
CURRENT CAPTURE (T): **1.564.608**

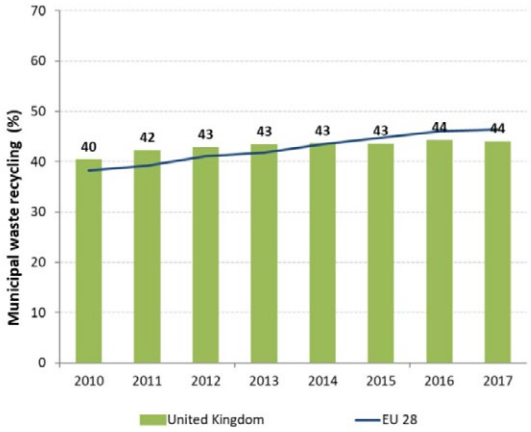
CURRENT CAPTURE (% ON POTENTIAL GENERATION): **20%**

AMOUNT STILL TO BE CAPTURED (T): **5.223.292**

BIO-WASTE

CURRENT CAPTURE (% ON POTENTIAL GENERATION): **31%**





After the BREXIT, national datasets have been dealt with separately by UK, and with slightly different methodologies and definitions. Latest available survey"UK Statistics on Waste"[1] reports, for 2022, a recycling rate of 44,1% for "Waste from households" which should, by and large, be similar to "Municipal Solid Waste"

Source: EC Environmental legislation implementation assessment, national reports 2019

INFO FROM EEA EARLY WARNING ASSESSMENT RELATED TO THE 2025 WASTE TARGETS

COLLECTION:

In England, almost all local authorities collect garden waste separately and about 50% collect food waste.
Wales acts as a guiding region in the UK having adopted a strategy highly focused on separate collection of food waste with intensive schemes across the whole country.

PLANS AND PROPOSALS:

In England, Anaerobic Digestion growth have been supported by measures such as feed-in tariffs and renewable heat incentives. The government announced in the Resource and Waste Strategy that it would carry out and publish a review of policies to support bio-waste recycling through AD and composting.

[1] https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste

6. Literature

- Bräutigam, K.-R., Jörissen, J., Priefer, C. The extent of food waste generation across EU-27: Different calculation methods and the reliability of their results (2014) Waste Management and Research, 32 (8), pp. 683-694. DOI: 10.1177/0734242X14545374
- Edible food waste from Norwegian households—Detailed food waste composition analysis among households in two different regions in Norway. Resources, Conservation and Recycling 109 (2016) 146–154
- EU FUSIONS, Estimates of European Food Waste Levels, 2016. ISBN 978-91-88319-01-2 https://www.eu-fusions.org/
- Eunomia, Report for the EC – DG ENVI, 2017. Study to Identify Member States at Risk of Non-Compliance with the 2020 Target of the Waste Framework Directive and to Follow-up Phase 1 and 2 of the Compliance Promotion Exercise
- European Commission, The Environmental Implementation Review 2019 – Country Reports (charts in country factsheets)
- European Compost Network: Country Reports, https://www.compostnetwork.info/downloads/country-reports/
- European Compost Network, ECN Status Report 2019, European Bio-waste Management.
- Eurostat, Waste Database. https://ec.europa.eu/eurostat/web/waste/data/database
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