Waste management and the circular economy in central and eastern Europe

An analysis of EU cohesion policy funding

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CEE Bankwatch Network

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1. Introduction

Municipal solid waste is a significant source of greenhouse gas emissions in cities. In addition to its potential for mitigating climate change, effective waste management is a key component of sustainable development, particularly in the context of the transition to a circular economy, protecting public health and the environment.

In this paper, we assess the impact of cohesion policy funding on the capacity and progress of selected central and eastern European countries in building efficient waste management systems that will enable transitioning to circular economy in accordance with the EU's new Circular Economy Action Plan. In the first part of the analysis, we focus on spending allocation in the previous (2014–2020) and current (2021–2027) cohesion policy funding periods. In the second part, we assess the effectiveness of the 2014–2020 cycle spending by analysing available country-level outputs.

A 2022 analysis[1] of the 2014–2020 funding distribution by field of intervention shows that less developed Member States, including all nine central and eastern European countries we focus on in this paper – Bulgaria, Croatia, Romania, Hungary, Czech Republic, Slovakia, Estonia, Latvia and Poland – invest more in infrastructure, while the more developed Member States invest more in research and development, human capital and aid to the private sector.

While building new infrastructure is important for increasing recycling capacity, one of the common indicators used under the cohesion policy,[2] an increase in the overall generated waste volumes shows that greater attention and funding should be directed towards funding and tracking progress across upper levels of the waste management hierarchy, focusing on waste prevention, reduction and reuse. Increasing recycling capacity will only be effective in the selected Member States if they manage to also build mechanisms and associated infrastructure that close the loops on different waste streams.

Closing the loop on biowaste – beginning with its separation from other components of municipal waste – is especially beneficial, as it prevents emissions of both carbon dioxide and methane resulting from the disposal of biowaste in landfills. In the EU, the waste sector accounts for 27 per cent of methane emissions, equalling 101 metric tonnes of carbon dioxide equivalent ($MtCO_2e$) in 2020.[3] Considering the current low levels of biowaste capture,[4] additional investments in improving biowaste management present a significant opportunity to advance the circular economy and meet the EU's recycling target.

[1] Francesca Crucitti, Nicholas-Joseph Lazarou, Philippe Monfort, Simone Salotti, The RHOMOLO impact assessment of the 2014–2020 cohesion policy in the EU regions, *Directorate-General for Regional and Urban Policy*, 10 October 2022.

[2] European Commission, 2014-2020 Cohesion Policy Overview, *European Commission*, accessed 19 February 2025.

[3] European Commission, European Union Methane Action Plan, *European Commission*, 14 October 2020.

[4] Enzo Favoino, Michele Giavini, Bio-waste generation in the EU: Current capture levels and future potential, *Bio-based Industries Consortium*, 5 November 2024.

2. Available sources of EU funding for waste sector decarbonisation

The new rules governing cohesion policy funding and the 'do no significant harm' principle under the Recovery and Resilience Facility have reduced the opportunities for financing incineration and waste landfill projects, which are the least preferred and most carbon-intensive waste treatment options. However, the current EU budget allocations for measures supporting the circular economy and waste management are insufficient and must increase if central and eastern Europe is to fulfil the EU's targets and objectives.

Cohesion policy funding represents around 50 per cent of all public financing in less developed EU countries.[5] Eight out of nine central and eastern European countries analysed in this paper (all except the Czech Republic) rank among the 10 EU countries with the lowest gross domestic product (GDP) per capita. In 2023, their GDP per capita was equal to or below 80 per cent of the EU average.[6] As a result, EU budgets serve as crucial indicators of the capacity of these countries to meet the EU's 2030 emission reduction targets. Unfortunately, many of these countries are struggling to implement measures aimed at meeting goals for the separate collection of waste, especially biowaste.

2.1 Introduction to EU cohesion policy funding and the 2015 Circular Economy Action Plan

The European Commission adopted its first Circular Economy Action Plan in 2015, which established a long-term strategy aimed at promoting waste prevention, increasing recycling and reuse, and reducing landfilling and incineration. The plan also set out measures to help businesses, citizens, and public authorities benefit from the transition to a stronger and greener economy.[7]

EU cohesion policy plays a vital role in implementing the circular economy. Between 2014 and 2020, substantial funding was dedicated to waste management and related circular economy projects. This funding supported innovation, boosted the competitiveness of small and medium-sized enterprises, improved resource efficiency, and encouraged low-carbon investments.

These investments are designed to address specific local challenges and create opportunities by increasing recycling rates, improving waste management practices, promoting resource and energy efficiency, developing the bio-economy, fostering innovative product design, establishing new business models, and generating green jobs.[8]

[5] European Commission, 9th Cohesion Report: Cohesion Policy Continues to Narrow the Gaps in EU Regions and Member States, *European Commission*, 27 March 2024.

[6] Eurostat, Gross domestic product (GDP) per capita, 2013-2023, (EU=100), *Eurostat*, accessed 14 February 2025.

[7] European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic And Social Committee and the Committee of the Regions: Closing the Loop – An EU Action Plan for the Circular Economy, *EUR-Lex*, 2 December 2015.

[8] European Commission, Cohesion policy support for the circular economy, *European Commission*, accessed 5 February 2025.

3. Overview of current EU funding for waste management

3.1 2014–2020 funding cycle

To evaluate waste management investments during the 2014–2020 funding cycle, statistical data from the Cohesion Open Data Platform was analysed.[9] In addition, Eurostat data was used to calculate waste management performance.

During the 2014–2020 period, the EU initially allocated EUR 4.3 billion to waste management, focusing on waste prevention, reuse and recycling. It also committed to investing in basic waste treatment infrastructure in less developed regions. The goal was to increase Europe's annual waste recycling capacity by 4.5 million tonnes.[10] Subsequent plan amendments increased the total cohesion policy funding for waste management by an additional EUR 900 million, raising the total allocation to EUR 5.2 billion.

As of February 2025, data from the Cohesion Open Data Platform indicates that the planned EU funding for waste management stands at EUR 3.84 billion. However, the EU budget that Member States decided to spend is considerably higher at EUR 5.31 billion. Reported expenditures amount to EUR 3.43 billion, representing 89 per cent of the planned budget and 65 per cent of the decided budget. The budgets and expenditures for waste management are distributed across three intervention fields:

- Code 017 – Household waste management, including minimising, sorting, and recycling waste (EUR 2.04 billion planned, EUR 2.78 billion decided and EUR 1.92 billion spent);
- Code 018 – Household waste management, including mechanical biological treatment, thermal treatment, incineration and landfill measures (EUR 1.51 billion planned, EUR 2.31 billion decided and EUR 1.33 billion spent);
- Code 019 – Commercial, industrial or hazardous waste management (EUR 284 million planned, EUR 221 million decided and EUR 189 million spent).

Of the total planned investment, EUR 2.80 billion (73 per cent) was secured through the Cohesion Fund, and EUR 1.04 billion (27 per cent) from the European Regional Development Fund.

Across the nine central and eastern European countries – Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Poland, Romania, and Slovakia – EUR 2.29 billion has been allocated for waste management activities, accounting for 60 per cent of the total cohesion policy funding for intervention codes 017, 018 and 019. Poland has the highest planned allocation of EUR 511 million (22 per cent of the cumulative budget for the nine countries), followed by Hungary with EUR 401 million (17 per cent) and the Czech Republic with EUR 342 million (15 per cent). Notably, Estonia did not avail of any cohesion policy funds for waste management.

The analysed states initially planned a total waste management budget and later decided on the final budgets for each intervention field. However, these figures do not account for funding efficiency, which

[9] European Commission, Cohesion Open Data Platform, *European Commission*, accessed 5 February 2025.

[10] European Commission, Cohesion policy support for the circular economy, *European Commission*, accessed 5 February 2025.

requires comparing the actual funds spent (as reported by the individual EU Member States) against the planned and decided budgets. Table 1 shows the planned, decided and actual reported expenditures for the three intervention fields, along with a calculation of spending efficiency.

Table 1. Planned budgets, decided budgets, and actual reported expenditure for waste management.

Country	Planned (EUR)	Decided (EUR)	Spent (EUR)	Percentage of planned budget spent	Percentage of decided budget spent
Bulgaria	80 601 801	96 492 608	88 311 627	110%	92%
Croatia	276 093 587	568 067 494	320 492 670	116%	56%
Romania	318 168 816	406 516 433	180 027 150	57%	44%
Hungary	401 451 492	297 650 967	239 087 509	60%	80%
Czech Republic	342 762 317	392 058 128	366 382 150	107%	93%
Slovakia	305 817 875	410 475 072	343 083 539	112%	84%
Estonia	-	-	-	-	-
Latvia	55 771 320	82 574 326	62 980 334	113%	76%
Poland	511 043 349	652 751 566	618 507 716	121%	95%
Total for countries analysed	**2 291 656 557**	**2 906 586 894**	**2 218 872 695**	**97%**	**76%**

Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

The overall absorption efficiency for the nine central and eastern European countries currently stands at 76 per cent of the total decided budget and 97 per cent of the total planned budget.

In almost all of the analysed states, reported spending exceeded the planned budget as a result of budget rebalancing, which tends to level planned and spent categories. Romania and Hungary are exceptions, with spending lagging at 57 and 60 per cent of the planned budget, respectively. When comparing approved funding with actual expenditure, the data show that most countries achieved spending levels above 75 per cent. However, Croatia reached only 56 per cent, largely due to significant underspending in intervention field 018, while Romania recorded the lowest rate at 44 per cent, primarily due to underspending in intervention field 017.

3.2 Analysis of investments per intervention field

As of February 2025, the funding statistics on household waste management, including the minimising, sorting, and recycling of waste (intervention field 017), show that most central and eastern Europe countries spent slightly less than their decided budgets, with EUR 317 million currently unused (19 per cent). On a more positive note, some countries exceeded their planned budgets. For instance, the Czech Republic invested EUR 252.7 million, significantly surpassing its planned budget of EUR 74.5 million, while Croatia spent EUR 178 million, exceeding its planned budget of EUR 106.2 million by an additional EUR 72 million.

Table 2. Planned budgets, decided budgets, and actual reported expenditure for household waste management, including minimising, sorting, and recycling waste (code 017).

Country	Planned (EUR)	Decided (EUR)	Spent (EUR)	Percentage of planned budget spent	Percentage of decided budget spent
Bulgaria	80 601 801	96 492 608	88 311 627	110%	92%
Croatia	106 247 637	194 197 709	178 023 455	168%	92%
Romania	69 997 140	233 200 393	79 112 613	113%	34%
Hungary	284 392 959	297 650 967	239 087 509	84%	80%
Czech Republic	74 580 528	263 536 737	252 720 951	339%	96%
Slovakia	232 285 412	275 558 600	234 798 002	101%	85%
Estonia	-	-	-	-	-
Latvia	44 998 656	65 854 308	54 033 983	120%	82%
Poland	367 877 744	235 483 818	219 106 572	60%	93%
Total for countries analysed	**1 260 981 877**	**1 661 975 140**	**1 345 194 712**	**107%**	**81%**

Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

These figures are particularly significant when analysing the investment breakdown by intervention fields, as they reveal which steps in the waste management hierarchy were prioritised by central and eastern European countries. Notably, the trends for lower hierarchy projects involving waste treatment and recovery are in opposition to trends observed in the recycling intervention field, as presented in Table 3.

Table 3. Planned budgets, decided budgets, and actual reported expenditure for household waste management, including mechanical biological treatment, thermal treatment, incineration and landfill measures (code 018).

Country	Planned (EUR)	Decided (EUR)	Spent (EUR)	Percentage of planned budget spent	Percentage of decided budget spent
Bulgaria	-	-	-	-	-
Croatia	169 791 950	373 869 785	142 469 215	84%	38%
Romania	248 171 676	173 316 040	100 914 537	41%	58%
Hungary	87 789 399	-	-	-	-
Czech Republic	185 430 910	95 007 071	82 577 329	45%	87%
Slovakia	16 283 900	47 318 342	32 657 550	201%	69%
Estonia	-	-	-	-	-
Latvia	9 184 249	12 750 000	5 476 421	60%	43%
Poland	109 348 320	381 678 499	368 029 030	337%	96%
Total for countries analysed	**826 000 404**	**1 083 939 737**	**732 124 082**	**89%**	**68%**

Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

The absorption rate for the waste treatment intervention field is significantly lower, reaching 89 per cent of the total planned budget and only 68 per cent of the total decided budget – 18 and 13 percentage points lower, respectively, than the rates achieved for the recycling intervention field. These results are largely affected by Poland's decision to invest 3.37 times more funds than initially planned.

Among the countries analysed, Hungary failed to spend its allocated financial resources, while Bulgaria removed its budget for the waste treatment intervention field in the last budget adjustment. As of February 2025, absorption rates vary widely, ranging from 41 to 337 per cent of the planned budgets.

This data indicates that implementing waste treatment projects is more challenging, offering lower absorption potential compared to recycling projects. The COVID-19 crisis, which drove up construction and equipment costs and complicated existing contracts, played a role in increasing the complexity of waste treatment projects and reducing flexibility.

Analysis of the commercial, industrial and hazardous waste management intervention field (code 019) shows that only a few Member States planned to invest in industrial waste projects.

Table 4. Planned budgets, decided budgets, and actual reported expenditure for commercial, industrial or hazardous waste management (code 019).

Country	Planned (EUR)	Decided (EUR)	Spent (EUR)	Percentage of planned budget spent	Percentage of decided budget spent
Hungary	29 269 134	-	-	-	-
Czech Republic	82 750 879	33 514 320	31 083 870	38%	93%
Slovakia	57 248 563	87 598 130	75 627 987	132%	86%
Latvia	1 588 415	3 970 018	3 469 930	218%	87%
Poland	33 817 285	35 589 249	31 372 114	93%	88%
Total for countries analysed	**204 674 276**	**160 671 717**	**141 553 901**	**69%**	**88%**

Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

Hungary had initially planned to invest in this intervention field, but failed to implement or report its spending. Overall, the countries analysed spent a total of EUR 141.6 million, representing 69 per cent of the originally planned budget of EUR 204.7 million and 88 per cent of the decided budget of EUR 160.7 million.

Case study: New biodegradable waste management infrastructure in Blagoevgrad, Bulgaria

Aerial view of the new anaerobic digestion facility in Blagoevgrad (photo: Blagoevgrad Municipality).

In 2018, the municipality of Blagoevgrad, a region in southwestern Bulgaria, launched a project involving the design and construction of anaerobic installations for the separately collected biodegradable waste. The project, which is yet to enter its operational phase, is part of the Bulgarian government's 2014–2020 environmental operational programme financed by the EU's European Regional Development Fund.

The total cost of the project is approximately EUR 14.3 million, with over 99 per cent funded by the EU and the remainder supplemented by the local authorities in Blagoevgrad. Funding covers the anaerobic digestion facility, its accompanying infrastructure, and the purchase of eight specialised trucks, along with brown bins for the separate collection of garden and food waste.

The new anaerobic digestion plant is expected to reduce the amount of biodegradable waste sent to landfill, increase the promotion of waste recycling and recovery, and foster greater citizen engagement in separate biowaste collection. The plant will serve 97,327 residents across five municipalities: Blagoevgrad, Simitli, Rila, Kocherinovo, and Boboshevo. The facility is expected to process 15,819 tonnes of biodegradable waste annually, including approximately 7,900 tonnes of food and paper waste and around 6,700 tonnes of green and wood waste.

The waste treatment process will be entirely natural, utilising a two-phase system. In the anaerobic phase, microorganisms decompose the waste in the absence of oxygen, producing around 1.18 million cubic metres of biogas annually. In the aerobic phase, the remaining biodegradable waste is composted, producing approximately 5,100 tonnes of compost per year.

The expected outputs of the facility involve the generation of approximately 2,411 megawatt hours (MWh) of electricity per year – enough to power around 915 households – and the generation of about 5,100 tonnes of compost annually, which can be used for gardening, agriculture, and landscaping. The plant is also expected to reduce carbon emissions by 33,018 tonnes per year and enhance waste management in the five municipalities by promoting recycling and recovery.

With construction complete, the process of subcontracting the operation of the anaerobic digestion facility and separate collection system is now underway. For the facility to function effectively, a minimum capacity of 50 per cent of its maximum capacity – equivalent to 8,000 tonnes of biowaste – must be met. The greatest challenge will be ensuring the separate collection of food waste (particularly in urban areas) while maintaining quality standards.

Before introducing the separate biowaste collection service as a new requirement for all residents, Blagoevgrad municipality has been developing both digital and offline awareness campaigns, meeting with key stakeholders – including citizen clubs, business owners, schools and universities – to inform and involve them from the outset. The municipality is also planning a gradual rollout of brown bins for biowaste, starting with schools and businesses.

However, the project is not without its challenges. One concern is that the investment assessment may have overestimated the biodegradable waste treatment capacity needed for the region, partly due to the unreliable and insufficiently detailed data on waste composition and quantity available in Bulgaria and the strict requirements set by the environmental operational programme. Specifically, the programme's guidance for candidate municipalities recommends a highly specific anaerobic digestion process known as dry methanisation, along with a minimum facility capacity of 15,000 tonnes per year, a figure apparently linked to this specific method.

The programme's restrictive requirements also limit the opportunity for Blagoevgrad to take in organic waste from neighbouring municipalities for the first five years of operation. Several neighbouring municipalities have already expressed interest in having their biodegradable waste treated at Blagoevgrad's facility, as it offers a more readily available and affordable alternative to building their own biodegradable waste treatment installation.

Indeed, collecting enough clean biodegradable waste to supply the installation – at least 50 per cent of its maximum capacity – will be challenging during the initial months of operation, largely due to the overestimated capacity and the absence of any investment in household biowaste separation tools, such as small-volume ventilated 'bio bins' and biodegradable bags. Finally, the limited budget and human resources for advertising and marketing campaigns make these challenges even greater.

Yet, despite these obstacles, the construction of the plant in Blagoevgrad marks a significant step towards achieving Bulgaria's national and regional waste management and climate goals. Once operational, the plant has the potential to showcase biodegradable waste as a valuable resource for energy generation and compost production while helping to reduce greenhouse gas emissions and reliance on landfills. The project also highlights the vital role of public involvement in the success of sustainable waste management initiatives.

3.3 2021–2027 funding cycle

In the 2021–2027 funding cycle, waste management in the nine analysed central and eastern European countries has been allocated an overall budget of EUR 3.19 billion under the Greener Europe policy objective. An initial comparison with the 2014–2020 funding cycle shows a 39 per cent increase in available funds.

Table 5. Comparison of planned EU budget allocations for Greener Europe and waste management in the 2021–2027 funding cycle.

Country	Total EU planned budget (EUR)	Planned Greener Europe budget (EUR)	Greener Europe budget as a percentage of total EU budget (%)	Planned waste management budget (EUR)	Ratio: Planned 2021–2027 vs. Planned 2014–2020	Ratio: Planned 2021–2027 vs. Spent 2014–2020
Bulgaria	10 705 921 309	2 029 440 093	18.96%	593 484 047	7.36	6.72
Croatia	8 706 569 538	2 441 455 599	28.04%	107 865 024	0.39	0.34
Romania	30 986 467 853	7 888 345 931	25.46%	336 736 093	1.06	1.87
Hungary	21 730 104 204	5 956 548 525	27.41%	281 624 884	0.70	1.18
Czech Republic	21 054 118 518	6 457 782 362	30.67%	374 355 753	1.09	1.02
Slovakia	12 593 734 933	4 197 548 170	33.33%	305 066 693	1.00	0.89
Estonia	3 369 336 786	805 726 337	23.91%	114 353 044	-	-
Latvia	4 434 286 919	1 119 584 667	25.25%	130 288 412	2.34	2.07
Poland	75 460 140 261	21 757 438 100	28.83%	948 875 928	1.86	1.53
Total for countries analysed	**189 040 680 321**	**52 653 869 784**	**27.85%**	**3 192 649 878**	**1.39**	**1.44**

Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

Country-level analysis reveals that Bulgaria has significantly increased its planned budget for waste management, now 7.36 times higher than in the previous funding cycle, as of February 2025. Poland has also increased its allocation 1.86 times, with a planned budget of EUR 948.88 million for waste management in the 2021–2027 funding cycle.

On the other hand, Croatia has seen the sharpest reduction in waste management funding for the 2021–2027 funding cycle, with its planned budget cut to only 39 per cent of the planned budget for the previous

period. However, a more thorough breakdown of investments is required to determine the reasons for this decrease. Hungary has also reduced its total planned budget, but still intends to spend more than it did in the 2014–2020 period. In contrast, Croatia's planned budget is EUR 212.66 million lower than the actual reported spending during the previous period.

Despite these shifts, the analysis reveals significant improvements at the project level across the nine analysed central and eastern European countries, with the majority of funds set to be allocated to upper levels of the waste management hierarchy.

Table 6. Budget allocations in the 2021–2027 funding cycle per intervention field.

Code	Intervention field description	Allocation for countries analysed (EUR)	Percentage of total waste management budget
069	Commercial, industrial waste management: prevention, minimisation, sorting, reuse, recycling measures	406 397 122	13%
070	Commercial, industrial waste management: residual and hazardous waste	105 286 734	3%
067	Household waste management: prevention, minimisation, sorting, reuse, recycling measures	1 513 948 785	47%
076	Support for environmentally friendly production processes and resource efficiency in large enterprises	199 118 253	6%
075	Support for environmentally friendly production processes and resource efficiency in small and medium-sized enterprises	743 479 213	23%
068	Household waste management: residual waste treatment	34 941 518	1%
072	Use of recycled materials as raw materials compliant with efficiency criteria	126 907 823	4%
071	Promoting the use of recycled materials as raw materials	62 570 430	2%
	Total	**3 192 649 878**	

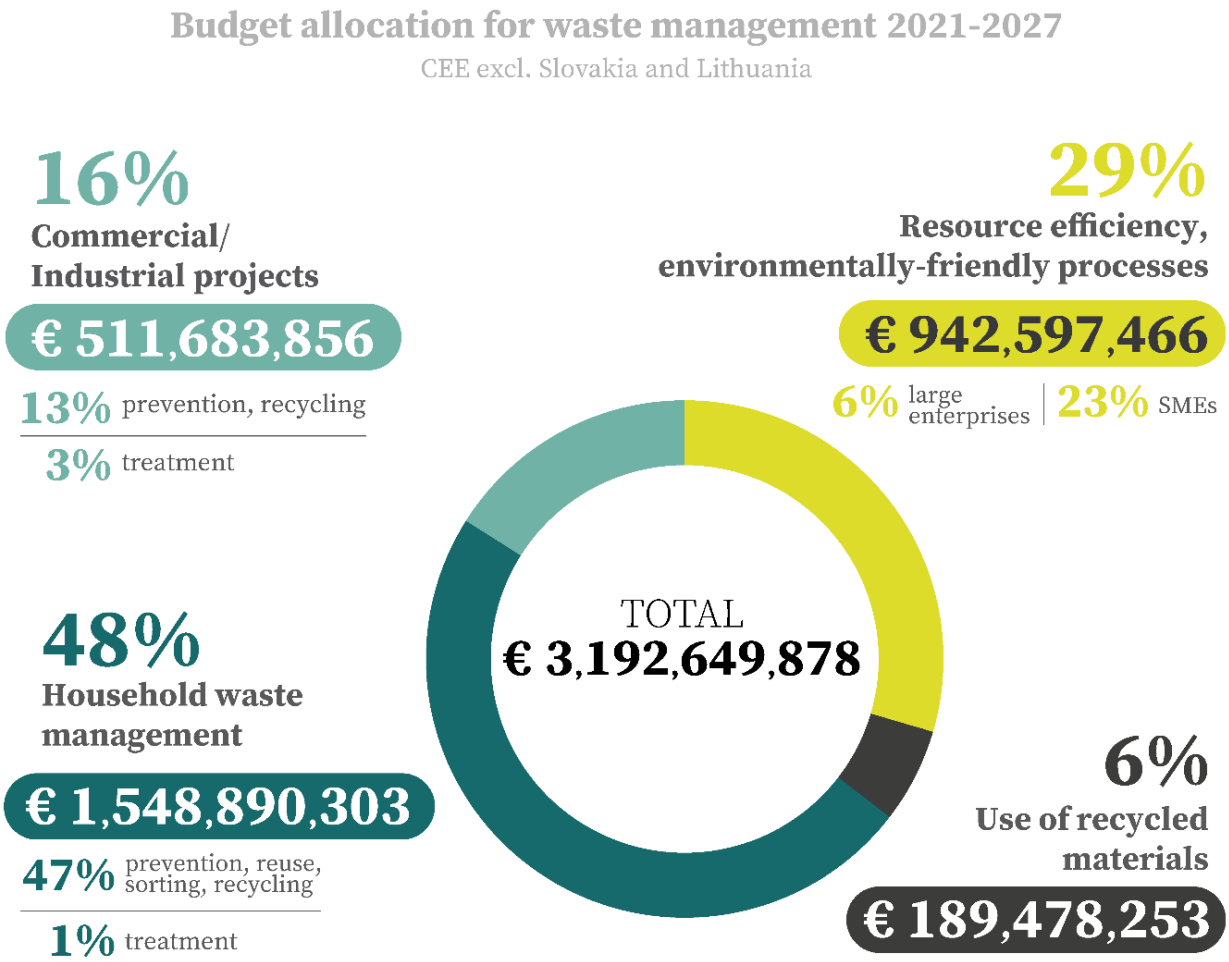
Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

Table 6 reveals that most of the funds have been allocated to measures aimed at preventing, minimising, sorting, reusing, and recycling waste, with combined household and industrial measures accounting for 60 per cent of the total allocation. Additionally, 29 per cent of the funds support environmentally friendly production and resource efficiency among small and medium-sized enterprises and large enterprises, further contributing to minimising and recycling waste.

Recycled materials usage has been supported with 6 per cent of the budget, with 4 per cent allocated to ensuring compliance with efficiency criteria and 2 per cent dedicated to promoting recycled materials across various industries.

Allocations for the management of industrial residual and hazardous waste account for 3 per cent of the fund, while household residual waste treatment receives the smallest share at just 1 per cent. This highlights the strategic focus on waste prevention and recycling over waste disposal.

Figure 1. Planned budget allocation for waste management in the 2021-2027 funding period



Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

Using a similar waste management categorisation to that employed for the 2014–2020 budget, the results indicate a 67 per cent increase in planned investments across the analysed countries for minimising, sorting, and recycling waste. In contrast, funding for household waste treatment methods has reduced to just 4 per cent of the 2014–2020 budget, while funds for commercial waste management have halved.

Table 7. Comparison of the 2014–2020 and 2021–2027 budgets based on the 2014–2020 waste management categorisation.

Intervention field (2014–2020)	Intervention field (2021–2027)	2014–2020 planned budget (EUR)	2021–2027 budget (EUR)	Ratio
017: Household waste management focused on minimising, sorting, and recycling waste	069, 067, 072, 071	1 260 981 877	2 109 824 160	1.67
018: Household waste management focused on mechanical, biological, thermal, and landfill waste treatment methods	068	826 000 404	34 941 518	0.04
019: Commercial, industrial or hazardous waste management	070	204 674 276	105 286 734	0.51
Other	075, 076		942 597 466	
Total		**2 291 656 557**	**3 192 649 878**	**1.39**

Data source: European Commission, Cohesion Open Data Platform, *European Commission*, accessed 19 February 2025.

As shown in Table 6, the more precise waste management categorisation under the 2021–2027 budget indicates that a significant portion of commercial waste investments has been allocated to recycling, amounting to EUR 406.40 million. This brings the total recycling allocation to EUR 2.11 billion, with an additional EUR 942.60 million separately designated for greening European industry.

After grouping the categories, Table 7 reveals a substantial shift towards recycling and clean production compared to 2014–2020, while funding for waste treatment methods has reduced to EUR 140.23 million. This number includes EUR 105.29 million for commercial waste management and EUR 34.94 million for household waste treatment.

4. Decarbonisation of waste management

Decarbonisation of the waste management sector involves reducing greenhouse gas emissions associated with waste collection, processing, treatment, and disposal. This requires implementing more sustainable practices, technologies, and systems throughout the waste management lifecycle towards reducing the carbon footprint.

The effect of EU funds on waste management decarbonisation during the 2014–2020 funding cycle can only be assessed by comparing the funds invested with the actual results issued by Member States. However, these results reflect not only EU investments, but also contributions from national and private funding sources.

As shown in Table 2, the total planned budget for the household waste management recycling intervention field for the 2014–2020 period was EUR 1.26 billion across the analysed countries, with EUR 1.66 billion ultimately decided. To assess the overall effectiveness of waste management financing for the 2014–2020 period, the performance of the nine central and eastern European countries was analysed using Eurostat data.

Table 8. Breakdown of waste generated and treatment method for the year 2014.

Country	Waste generated (kg per capita)	Recycled	Composted	Total recycled and composted	Incinerated	Landfilled
Bulgaria	451	21%	2%	23%	2%	69%
Croatia	390	14%	2%	16%	0%	80%
Romania	249	5%	8%	13%	3%	72%
Hungary	386	25%	6%	31%	10%	58%
Czech Republic	310	23%	3%	26%	18%	56%
Slovakia	320	5%	5%	10%	11%	67%
Estonia	357	27%	5%	32%	47%	6%
Latvia	364	23%	4%	27%	1%	71%
Poland	272	21%	6%	27%	15%	58%

Note: Treatment method totals may not equal 100 per cent.

Data source: Eurostat, Municipal waste by waste management operations, *Eurostat*, accessed 14 February 2025.

Table 8 shows that in 2014, most of the analysed countries had only just begun implementing full-scale recycling programmes, given that composting rates remained below 10 per cent overall. Comparing these statistics to those for the year 2020 (see Table 9) provides a hypothetical estimate of the effect of EU funding on decarbonisation of the waste management sector.

Table 9. Breakdown of waste generated and treatment method for the year 2020.

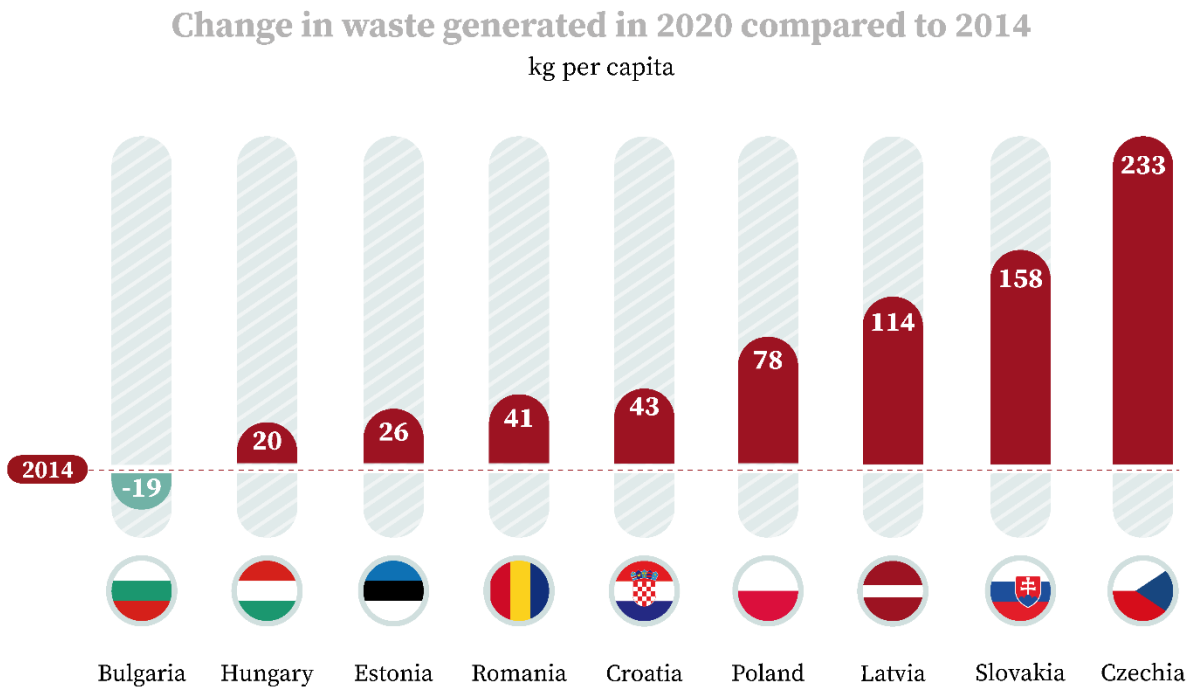
Country	Waste generated (kg per capita)	Total recycled and composted	Incinerated	Landfilled
Bulgaria	432	35%	5%	67%
Croatia	433	29%	0%	60%
Romania	290	12%	5%	74%
Hungary	406	32%	12%	54%
Czech Republic	543	41%	13%	48%
Slovakia	478	45%	7%	46%
Estonia	383	29%	43%	15%
Latvia	478	40%	3%	53%
Poland	350	39%	21%	40%

Note: Treatment method totals may not equal 100 per cent.

Data source: Eurostat, Municipal waste by waste management operations, *Eurostat*, accessed 14 February 2025.

The 2020 statistics show that none of the countries had met the EU's Waste Framework Directive target of 50 per cent separate collection of municipal solid waste by 2020. Nevertheless, the results indicate a relative improvement compared to 2014 figures.

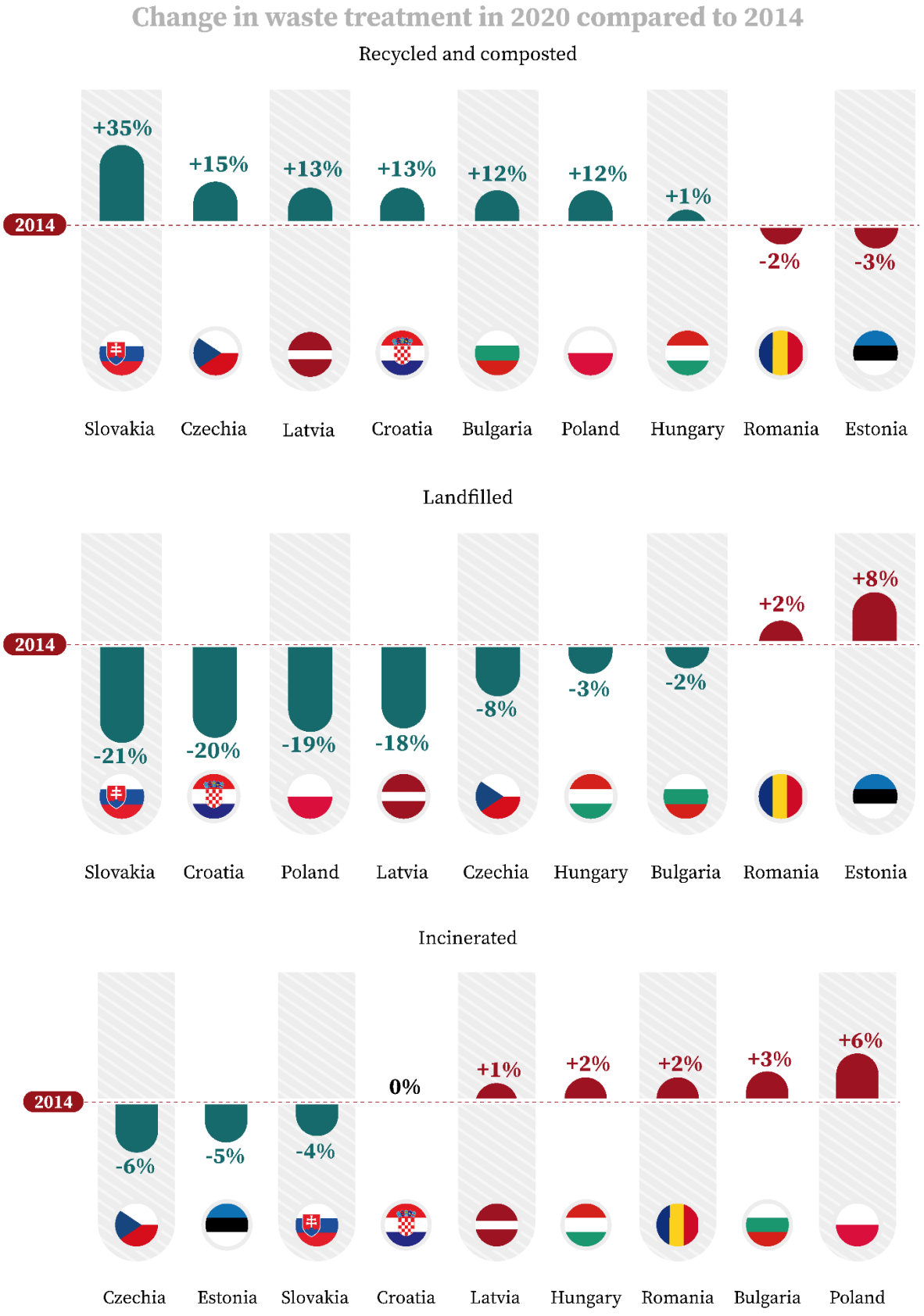
Figure 2. Change in waste generated per capita in 2020 vs. 2014.



Data source: Eurostat, Municipal waste by waste management operations, *Eurostat*, accessed 14 February 2025.

Regrettably, the results show that certain indicators did not improve during the 2014–2020 funding cycle, particularly waste generated per capita (Figure 2). Waste quantities only reduced in Bulgaria, whereas significant increases occurred in the Czech Republic, Latvia, and Slovakia. Estonia increased landfill waste and reduced incinerated, recycled, and composted waste. However, since Estonia elected not to avail of EU funds for waste management, it is excluded from further analysis. All other countries, except for Romania, reduced landfilling and increased the amount of waste recycled (Figure 3). The most significant increases in recycled and composted waste quantities occurred in the Czech Republic (from 26 to 41 per cent) and Slovakia (from 10 to 45 per cent).

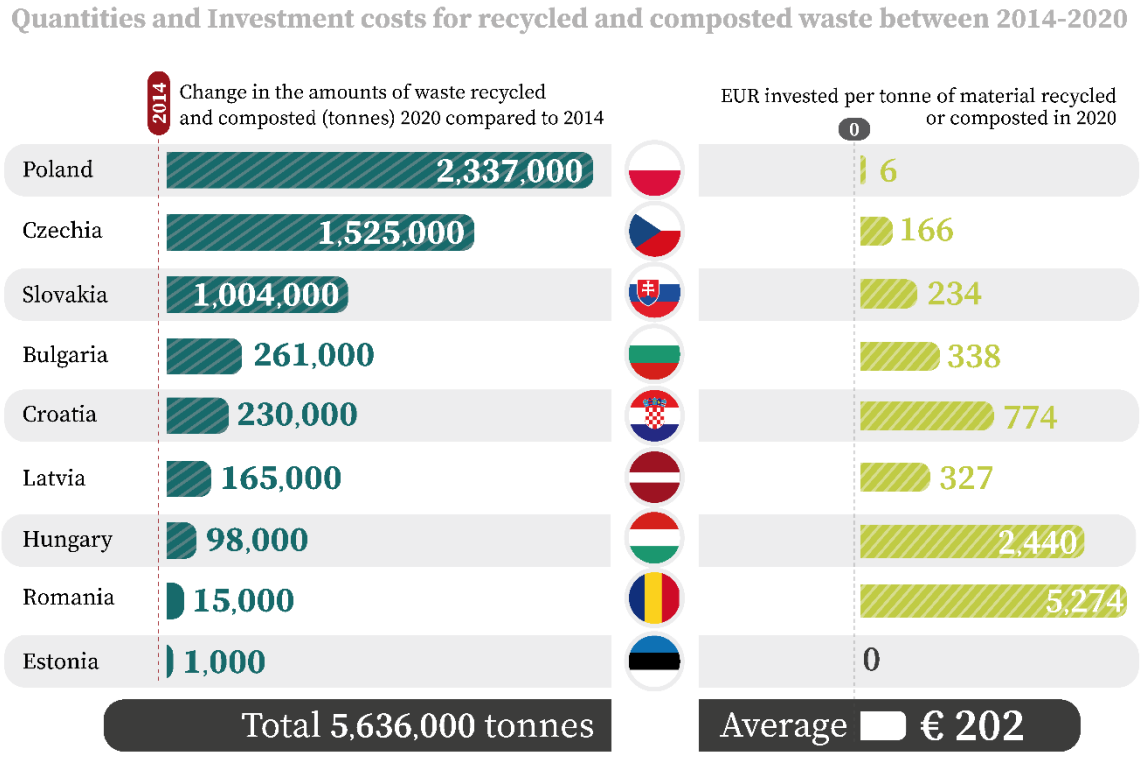
Figure 3. Change in waste recycled, landfilled and incinerated in 2020 vs. 2014.



Data source: Eurostat, Municipal waste by waste management operations, *Eurostat*, accessed 14 February 2025.

The quantity of recycled and composted waste in the countries analysed increased by 5.63 million tonnes in 2020 compared to 2014 (Figure 4). This equates to a total EU investment of EUR 202.16 per tonne recycled in 2020. Returns have most likely multiplied in recent years, given that recycling investments are typically planned over a period of 10 to 25 years.

Figure 4. Waste recycling and composting quantities in 2020 vs. 2014 and investment per tonne in 2020.



Data source: Eurostat, Municipal waste by waste management operations, *Eurostat*, accessed 14 February 2025.

Carbon dioxide savings vary by material, with estimates ranging from 1 tonne of carbon dioxide saved per tonne of recycled paper to up to 3 tonnes for recycled plastic. Since 1990, total greenhouse gas emissions from the waste sector in European countries have decreased by 42 per cent in 2024 and are projected to decline further, reaching a 68 per cent reduction by 2050 compared to 1990 levels.[11]

5. Methane emission reduction allocations

Decarbonisation and methane emission reductions are closely connected, as emission avoidance per tonne of recycled materials also includes the carbon dioxide equivalent (CO2e) reduction from the prevention of landfilling. The key difference between decarbonisation and methane emissions reductions is that investments in landfilling and waste treatment also contribute to an overall reduction in CO_2e.

[11] European Environment Agency, Better links between waste management, circular economy and climate change mitigation measures can boost greenhouse gas emission reductions, *European Environment Agency*, 22 February 2024.

Direct greenhouse gas emissions from landfills, primarily due to the dispersive release of methane, are major contributors to total greenhouse gas emissions. Based on the USEPA's GHG Emission Factors Hub,[12] disposal of 1 metric tonne of mixed municipal solid waste in landfills, results in emissions of 0.64 $MtCO_2e$. In 2020, the waste management sector was responsible for an estimated 101 million $MtCO_2e$, accounting for 27 per cent of total methane emissions in the EU.[13]

The total amount of landfilled waste increased by 73,000 tonnes in 2020 compared to 2014. However, this is largely due to differences in reporting practices among Member States for the year 2014. Notably, in some cases, only household waste was reported as municipal waste until 2016. In the Czech Republic, for example, the inclusion of company waste similar to household waste, in addition to waste generated by households, from 2016 onwards increased reported landfill volumes by almost 1 million tonnes.[14]

Table 10. Change in landfilled waste in 2020 vs. 2014.

Country	Landfilled waste in 2014 (tonnes)	Landfilled waste in 2020 (tonnes)	Change (tonnes)
Bulgaria	2,217,000	1,903,000	–314,000
Croatia	1,310,000	1,023,000	–287,000
Romania	3,558,000	4,114,000	556,000
Hungary	2,181,000	2,124,000	–57,000
Czech Republic	1,827,000	2,774,000	947,000
Slovakia	1,158,000	1,189,000	31,000
Estonia	30,000	75,000	45,000
Latvia	515,000	480,000	-35,000
Poland	6,031,000	5,218,000	-813,000
Total	**18,827,000**	**18,900,000**	**73,000**

Data source: Eurostat, Municipal waste by waste management operations, *Eurostat*, accessed 14 February 2025.

Table 10 shows a reduction in landfilled waste in several of the analysed countries, but also an increase in Romania, Czech Republic, Slovakia and Estonia. However, due to the previously mentioned inconsistencies in baseline data from the Czech Republic for the year 2014, an estimate excluding the Czech Republic suggests that at least 874,000 tonnes of waste were diverted in the remaining eight countries, preventing 558,783 tonnes of CO2e emissions from landfills, calculated at 0.64 MtCO2e per tonne of landfilled municipal solid waste.

[12] United States Environmental Protection Agency, GHG Emission Factors Hub, *United States Environmental Protection Agency*, updated 16 January 2025, accessed 14 February 2025.

[13] European Commission, European Union Methane Action Plan, *European Commission*, 14 October 2020.

[14] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry of the Environment of the Czech Republic, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Czechia, *European Environment Agency*, June 2022.

Despite this progress, the total landfilled waste in the countries analysed still amounted to almost 19 million tonnes in 2020, meaning the reduction in CO2e represents less than 6 per cent. Although waste recycling increased significantly, the overall growth in generated waste prevented more substantial reductions in landfilling.

The reduction in methane emissions from landfill avoidance, along with composting and anaerobic digestion of biowaste means additional CO2e savings can be calculated for each country between 2014 and 2020. In conventionally managed landfills, one metric tonne of mixed organics releases 0.6 MtCO2e fugitive methane emissions.[15]

Table 11. Biowaste collection and CO_2e savings in 2020 vs. 2014.

Country	Biowaste collected in 2020 (tonnes)	Change in biowaste collection in 2020 vs. 2014 (tonnes)	Collected biowaste as a percentage of total waste generated in 2020	Additional CO_2e savings in 2020 vs. 2014 (tonnes)
Bulgaria	89,000	30,000	3%	17,857
Croatia	87,000	53,000	5%	31,548
Romania	353,000	–38,000	6%	-22,619
Hungary	384,000	148,000	10%	88,097
Czech Republic	751,000	658,000	13%	391,673
Slovakia	355,000	264,000	14%	157,145
Estonia	14,000	–8,000	3%	-4,762
Latvia	66,000	40,000	7%	23,810
Poland	1,578,000	1,018,000	12%	605,962
Total	**3,677,000**	**2,165,000**	**10%**	**1,288,712**

Data source: Eurostat, Municipal waste by waste management operations, *Eurostat*, accessed 14 February 2025.

Composting and anaerobic digestion accounted for a maximum of 14 per cent of total municipal waste generated in Slovakia, but dropped as low as 3 per cent in Estonia and Bulgaria (Table 11). The total increase in collected biowaste across the countries amounted to 2.17 million tonnes in 2020 compared to 2014. Had this waste been landfilled, it would have produced approximately 1.29 million $MtCO_2e$.

If all of the countries analysed were to achieve a 50 per cent composting rate for generated biowaste, which is estimated at 34 per cent of total municipal solid waste generated,[16] the potential reduction in emissions would equal 3.74 million $MtCO_2e$. Currently, EU landfills produce an estimated 80 million $MtCO_2e$ annually.[17] The 1.29 million $MtCO_2e$ reduction in 2020 (Table 13) represents 1.61 per cent of total EU landfill-related emissions. Therefore, the total potential reduction from biowaste in the analysed countries – provided 50

[15] United States Environmental Protection Agency, GHG Emission Factors Hub, *United States Environmental Protection Agency*, updated 16 January 2025, accessed 14 February 2025.

[16] European Environmental Agency, Bio-waste in Europe — turning challenges into opportunities, *Publications Office of the European Union*, 2020.

[17] European Commission, European Union Methane Action Plan, *European Commission*, 14 October 2020.

per cent of biowaste is collected separately and diverted from landfills – amounts to 3.74 million $MtCO_2e$, or 4.7 per cent of total landfill-related emissions.

Identifying the type and volume of spending during the 2014–2020 funding cycle would require significantly more detailed research. Unfortunately, the available data from the Cohesion Open Data Platform does not specify the exact projects included in the statistics, as the country breakdowns were calculated at the programme rather than the project level. However, it is reasonable to assume that most of the funds spent in the household waste recycling intervention field, as well as a portion of the funds spent on the household waste treatment intervention field, did contribute to both methane and carbon dioxide emission reductions in the waste management sector. This is because landfill sanitation helps reduce methane emissions when equipped with torch burners or diesel motors for the combustion of collected methane.

Some EU-funded projects have been demonstrably effective in reducing both carbon dioxide and methane emissions from landfills. A successful example is the City of Zagreb's municipal waste reduction project, which ran from 2015 to 2022. This EUR 12 million initiative modernised the city's waste collection system, including the purchase of new trucks, waste bins, IT infrastructure, and other necessary equipment.[18] Its impressive impact is reflected in Zagreb's waste statistics. In 2016, the amount of mixed municipal waste sent to landfills amounted to 219,184 tonnes. By 2023, this figure had dropped to 139,775 tonnes, marking a reduction of 79,409 tonnes of waste sent to landfills annually. This decrease has contributed to lowering both carbon dioxide and methane emissions.[19]

EU funding also supports waste management projects that generate benefits both within and beyond the waste sector. For instance, in 2019, in the town of Harmanli in south-central Bulgaria, the European Regional Development Fund committed to investing over EUR 1.5 million to develop a new composting facility capable of processing 3,000 tonnes of biodegradable and green waste annually.[20]

A similar project in Handlová, Slovakia, demonstrates further impact. This small town secured funding for an integrated project consisting of a composting facility, collection containers, specialised vehicles, and processing equipment. Boasting an annual processing capacity of 1,350 tonnes, the facility began operations in mid-2019. The EUR 891,022 investment has led to the establishment of a significantly improved waste management system for the entire municipality.[21] However, because projects like these are typically smaller in scale, they receive little to no international media coverage.

[18] City of Zagreb, Završen projekt smanjenja komunalnog otpada u Gradu Zagrebu, *City of Zagreb*, 28 November 2022.

[19] Institute for Environmental Protection and Nature, Izvješće o komunalnom otpadu za 2023. godinu, *Ministry of Environmental Protection and Green Transition of Croatia*, September 2024.

[20] European Commission, New composing facility in the pipeline for Harmanli, Bulgaria, *European Commission*, 18 September 2019.

[21] European Commission, Turning green waste into quality compost in Handlová, Slovakia, *European Commission*, 29 May 2020.

Case study: Biowaste management on Krk island, Croatia

Composting facility

Source: Mladen Trinajstić, Na Krku svim korisnicima komunalnih usluga besplatno dijele kompost. Evo kako ga dobiti, *Novi list*, 7 March 2023.

The waste management system on the island of Krk, Croatia, has been internationally recognised as a model of good practice. In 2024, the island received the Mission Zero Academy's prestigious Zero Waste Certification on behalf of Zero Waste Europe. This outstanding achievement comes despite the heavy pressures of tourism, which sees the island's population multiplying during the summer months.

One of the secrets to the success of the island's solid waste management system is the collection and treatment of biowaste, which contributes to the reduction of methane emissions from landfilling. Biowaste is collected via a door-to-door system using small-volume, 23-litre containers and compostable bags.

This method has resulted in highly efficient separate biowaste collection (over 70 per cent) while keeping the proportion of biowaste in the mixed waste stream low. These results have been confirmed by regular analyses of mixed waste composition conducted on the island. Thanks to this effective collection system, the quantity of biodegradable waste sent to landfills in 2022 reduced by as much as 60 per cent compared to 2006 levels.

In addition to the door-to-door collection model, residents can also dispose of larger quantities of biowaste at seven recycling centres, one in each municipality on the island. Following the implementation of the

collection system, the island established an efficient biowaste treatment system supported by a dedicated composting facility.

Covering an area of approximately 2,800 square metres, the facility operates by turning compost piles while adding effective microorganisms. This process enables the island to handle over 5,000 tonnes of biowaste annually, producing high-quality compost.

Since 2019, an automatic pretreatment machine for separately collected biowaste has been in operation. Due to the continuous increase in separately collected biowaste, the need for faster processing has become essential. The machine enables all biowaste to pass through a facility equipped with a bag opener and dynamic screen, which removes impurities and prepares the material for compost piling. It also plays a key role in maintaining a low contamination rate throughout the composting process.

The compost produced at the island's composting plant is partially distributed to residents as a reward for their waste separation efforts, with the remainder sold on the market as high-quality fertiliser. Recognising the importance of this resource, a EUR 1.46 million modernisation of the composting facility began in 2024, supported by a 90 per cent co-funding contribution from the EU and the Croatian government.

The modernised composting plant will utilise tunnel composting technology and introduce several technological improvements, including fully automated aeration systems, making the composting process faster and more efficient. The modernisation will also allow for the treatment of sludge from eight biological wastewater treatment plants on the island, converting it to compost.

Complementing these efforts, a longstanding educational initiative informing residents across all age groups about the value of separate waste collection and composting has significantly contributed to Krk's outstanding results in municipal waste management.

6. Funding needs of central and eastern European countries

Methane reduction goals can be achieved by employing several strategies. These include the separate collection of biodegradable waste to prevent methane production at landfills, treatment of waste prior to landfilling, landfill sanitisation, and the use of methane-capture systems. As of 1 January 2024, all EU Member States are required to provide citizens and businesses with separate biowaste collection services for food and garden waste.

Investment priorities for these initiatives are determined based on a June 2023 report from the European Commission identifying Member States at risk of not meeting the 2025 preparing for re-use and recycling target for municipal waste, the 2025 recycling target for packaging waste, and the 2035 municipal waste landfilling reduction target. The report identifies key gaps in each analysed country.[22]

Bulgaria

Bulgaria faces significant shortfalls in its waste management infrastructure, particularly in separate collection, recycling, and economic measures like pay-as-you-throw collection systems and landfill and incineration taxes. To meet the 50 per cent recycling target, funding must shift from mixed waste treatment to developing infrastructure for separate collection, sorting, and recycling.

Biowaste treatment is especially lacking, with current capacity far below the required levels. While 22 biowaste recovery installations are now operational and 46 more are under construction, the projected capacity will only cover 55 per cent of total biowaste treatment needs, leaving a considerable gap. Without these improvements, Bulgaria risks continued over-reliance on mixed waste treatment and falling short of its recycling goals.[23]

Croatia

Croatia's waste management system remains heavily reliant on landfilling, with 79 per cent of biodegradable waste landfilled as of 2020. The country needs substantial investment to develop infrastructure aligned with the higher steps of the waste hierarchy, such as composting and biowaste treatment. While plans to extend treatment plants are underway, the projected capacity still falls short of the total biowaste generated, necessitating further financial support.

In addition to expanding treatment facilities, Croatia should implement measures to reduce non-recyclable municipal waste and promote home composting. There is a need for targeted investment in reuse programmes and public awareness campaigns to encourage waste separation and prevent waste generation at source.[24]

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[22] European Commission, Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions identifying Member States at risk of not meeting the 2025 preparing for re-use and recycling target for municipal waste, the 2025 recycling target for packaging waste and the 2035 municipal waste landfilling reduction target, *European Commission*, 8 June 2023.

[23] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Executive Environment Agency of the Ministry of Environment and Water of Bulgaria, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Bulgaria, *European Environment Agency*, June 2022.

[24] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry of Economy and Sustainable Development of Croatia, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Croatia, *European Environment Agency*, June 2022.

Romania

Romania faces critical gaps in its waste management infrastructure, particularly in the separate collection of waste. To address this, Romania needs to extend separate collection services nationwide and improve public awareness and participation. Economic incentives like the pay-as-you-throw system and increasing landfill taxes are recommended to encourage waste separation and reduce landfill use. These steps will require significant investment in both infrastructure and public education.

Additionally, Romania must increase biowaste treatment capacity to cover all generated biowaste, supporting home composting, and setting national quality standards for biowaste used as fertilizer. Investments should focus on building waste treatment infrastructure in line with the waste hierarchy and promoting circular economy practices.[25]

Hungary

Hungary's waste management system requires a systemic approach to improve collection methods and increase recycling rates. A significant need exists for investments in better waste collection infrastructure, with a focus on expanding separate collection services for recyclable materials and biowaste. Efficient spending should prioritise the development of infrastructure that supports higher waste hierarchy practices, reducing reliance on landfilling.

Hungary also needs to develop a more consistent collection methodology to improve waste separation across municipalities. Targeted investments in public awareness campaigns and waste management infrastructure are crucial to ensure Hungary meets its recycling and waste reduction targets.[26]

Czech Republic

The Czech Republic has made progress in waste management, with high convenience collection points and door-to-door services for paper, cardboard, metals, and glass. However, biowaste collection is still limited, mainly focused on garden waste. Plans to expand the collection of food waste, wood, and textiles are underway, but significant investment is needed to fully implement these services, especially in rural areas.

Investment priorities should focus on enhancing separate collection systems for all types of waste, particularly biowaste. Expanding door-to-door services and ensuring the proper processing of collected materials will be essential to meet recycling targets. Strategic spending should aim to improve infrastructure and public engagement in waste separation.[27]

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[25] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Waste Management Department of the Ministry of Environment, Water and Forests of Romania, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Romania, *European Environment Agency*, June 2022.

[26] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry for Innovation and Technology of Hungary, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Hungary, *European Environment Agency*, June 2022.

[27] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry of the Environment of the Czech Republic, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Czechia, *European Environment Agency*, June 2022.

Slovakia

Slovakia is working towards reducing its amount of biodegradable municipal waste by 25 per cent by 2025. The country has identified the need for improved biowaste collection services and increased composting capacity. Legal initiatives and awareness-raising campaigns are key elements in achieving these goals. However, additional funding is necessary to support infrastructure expansion and improve collection coverage.

Investments should focus on building new composting facilities and upgrading existing waste management systems. Slovakia's National Waste Management Plan highlights the need for targeted spending on expanding biowaste collection services, ensuring that municipalities have the resources and capabilities to meet these ambitious targets.[28]

Estonia

Estonia has made limited progress in waste recycling, with only 28.9 per cent of municipal waste recycled in 2020, a slight increase from 2016. A large share of waste is incinerated for energy recovery (43 per cent), while only a small fraction (3 per cent) is composted. Estonia's landfill rate is below the EU average, but significant improvements in recycling infrastructure are needed. The country lacks sufficient composting capacity and must focus on increasing separate collection services for biowaste.

Investments should be directed towards improving municipal responsibility for meeting recycling targets, enhancing biowaste processing facilities, and encouraging the use of economic instruments such as the pay-as-you-throw system.[29]

Latvia

Latvia is planning to expand its separate waste collection services by increasing the number of collection points and enhancing door-to-door systems. While biowaste collection is considered sufficient, there is still room for improvement in overall waste management infrastructure, particularly in increasing the capacity for recycling and biowaste processing.

Targeted investments should focus on expanding the collection network and improving the treatment infrastructure for biowaste and recyclables.[30]

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[28] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry of the Environment of Slovakia, Slovak Environmental Agency, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Slovakia, *European Environment Agency*, June 2022.

[29] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry of the Environment of Estonia, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Estonia, *European Environment Agency*, June 2022.

[30] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry of Environmental Protection and Regional Development of Latvia, Latvian Environment, Geology and Meteorology Centre, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Latvia, *European Environment Agency*, June 2022.

Poland

Poland's separate biowaste collection system is hindered by low capture rates, and its biowaste recycling capacity is insufficient. While efforts have been made to improve the system, much of the biowaste is still not being processed in line with the higher steps of the waste hierarchy, which focuses on recycling and composting. Investment is needed to further develop waste treatment infrastructure, particularly to expand biowaste treatment facilities and promote home composting.

Key funding priorities should include extending the pay-as-you-throw system to all households and fully implementing cost-coverage rules under extended producer responsibility for packaging.[31]

7. Announced and ongoing waste management projects

In southeastern Bulgaria, a new state-of-the-art facility is being developed for the municipalities of Burgas, Nessebar, and Pomorie. The facility includes an anaerobic digestion installation with a capacity of 30,652 tonnes per year, featuring eight bioreactors, a biogas system, gas storage, and other equipment. Dry methanation has been chosen as the method for the anaerobic process. The facility also includes a composting installation comprising six composting tunnels. The project received EUR 14 million in co-funding from the European Regional Development Fund.[32]

The Czech Ministry of the Environment has announced that it will be awarding approximately EUR 21 million in funding to develop the country's existing waste management infrastructure. New calls for proposals under the 2021–2027 Environment Operational Programme have been issued for projects focused on waste sorting and re-sorting, as well as chemical recycling.[33]

Croatia plans to consolidate all allocations for waste infrastructure into a single call for proposals, allocating EUR 20 million each for waste sorting facilities, composting facilities, and construction and demolition waste. However, these figures fall significantly short of the EUR 2.18 billion estimated as necessary by the national waste management plan.[34]

Romania's waste management policy remains outdated, favouring inefficient collection systems over more effective solutions. Backed by a EUR 1.2 billion waste management plan, the government intends to implement 565 civic amenity sites and 14,000 digitalised underground green islands. However, these approaches run counter to the door-to-door collection system recommended by experts. There are also plans for seven integrated all-waste collection centres, but they are likely to rely on mixed waste treatment technologies, making them ineligible for EU funding.[35]

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[31] European Topic Centre on Waste and Materials in a Green Economy, European Topic Centre on Circular Economy and Resource Use, Rambøll Group, Ministry of Climate and Environment of Poland, Early warning assessment related to the 2025 targets for municipal waste and packaging waste – Country profile: Poland, *European Environment Agency*, June 2022.

[32] European Commission, Investing in a cleaner environment: new waste installation in Bulgaria, *European Commission*, 20 November 2023.

[33] Ann Kühlers, Czechia announces state funding for waste infrastructure projects, *EUWID Recycling and Waste Management*, 20 December 2023.

[34] Ministry of Economy and Sustainable Development of Croatia, Odluka o donošenju Plana gospodarenja otpadom Republike Hrvatske za razdoblje 2023. – 2028. godine, *Official Gazette of the Republic of Croatia*, 28 June 2023.

[35] Petre Barac, Clean Recycle analysis: What Romania's 1.2 billion Euro plan for waste management looks like, *The Diplomat-Bucharest*, 29 June 2022.

Conclusions

This report evaluates the effectiveness of investments in the waste sector, particularly in decarbonisation, and finds that current EU funding allocations alone are insufficient to meet the EU's 2030 emission reduction targets. Despite an overall increase in funding for waste management, especially for recycling initiatives, the recycling progress achieved has fallen short of the Waste Framework Directive's 2020 target, with many central and eastern European countries still lagging behind.

The planned waste management budget for the 2014–2020 funding period was originally set at EUR 4.3 billion, with EUR 3.43 billion spent by February 2025. While the 2014–2020 funding cycle led to some improvements in recycling and landfill waste reduction, this report highlights the slow progress in reducing methane emissions from landfills. Cutting emissions of methane, a potent greenhouse gas, remains a significant challenge. Decarbonisation efforts, such as composting and anaerobic digestion, accounted for only a small portion of total waste management efforts.

Overall, while EU funding is helping to improve recycling infrastructure and reduce waste, current funding levels are not sufficient to close the gap between current performance and future EU decarbonisation targets. More targeted investments in biowaste treatment, methane-capture technologies, and the circular economy are needed to decarbonise the waste sector effectively.

The 2021–2027 funding cycle for EU waste management is more progressive than the 2014–2020 period, both in terms of budget allocation and its focus on higher-priority waste hierarchy practices like recycling, composting, and decarbonisation.

Main findings

Funding has increased

The planned budget for waste management and the circular economy in the analysed countries has increased by 39 per cent over the 2021–2027 period compared to the 2014–2020 period.

Greater focus on higher waste hierarchy levels

The 2021–2027 funds prioritise preventing, minimising, sorting, reusing, and recycling waste, with 60 per cent of the total allocation directed toward household and industrial waste management, primarily recycling. This marks a clear shift towards more sustainable and resource-efficient practices compared to the previous funding cycle.

Decarbonisation efforts have intensified

The new funding cycle places greater emphasis on decarbonising the waste sector. Investments focus on reducing methane from landfills, increasing separate biowaste collection, and reducing the reliance on landfilling. The anticipated carbon dioxide reductions exceed those of the previous funding cycle due to increased investment in composting and anaerobic digestion facilities.

Methane reduction newly prioritised

Reducing methane emissions has become a key priority, with improved waste management practices resulting in an additional 1.29 million tonnes in carbon dioxide savings in 2020 compared to 2014. If the separate collection of biowaste reaches 50 percent of the biowaste generated in the analysed countries, CO_2e emissions could be further reduced by 2.46 million tonnes, reaching a total amount of 3.74 million MCO_2e savings. However, the overall effectiveness will still depend on the proper utilisation of funds and the ability to overcome implementation challenges.

Annex 1. Breakdown of allocations for circular economy and waste management per country and intervention field in the 2021–2027 funding cycle (EUR).

Code	Intervention field description	Bulgaria	Croatia	Romania	Hungary	Czech Republic	Slovakia	Estonia	Latvia	Poland	Total per category
069	Commercial, industrial waste management: prevention, minimisation, sorting, reuse, recycling measures	160 645 000			8 275 316	36 327 157	67 608 998	32 000 000	47 890 764	53 649 887	406 397 122
070	Commercial, industrial waste management: residual and hazardous waste				8 275 316	41 390 322		3 324 081		52 297 015	105 286 734
067	Household waste management: prevention, minimisation, sorting, reuse, recycling measures	222 399 979	56 865 024	240 000 000	193 385 323	150 825 625	186 597 339	35 528 963	59 927 000	368 419 532	1 513 948 785
076	Support for environmentally friendly production processes and resource efficiency in large enterprises	16 000 000	14 700 000	17 850 000		30 197 871		10 000 000	6 670 382	103 700 000	199 118 2531
075	Support for environmentally friendly production processes and resource efficiency in small and medium-sized enterprises	194 439 068	36 300 000	78 886 093	47 472 924	70 461 699		24 500 000	14 200 266	277 219 163	743 479 213
068	Household waste management: residual waste treatment				24 216 005	7 525 513				3 200 000	34 941 518
072	Use of recycled materials as raw materials compliant with the efficiency criteria					37 627 566	49 527 023		1 600 000	38 153 234	126 907 823
071	Promoting the use of recycled materials as raw materials						1 333 333	9 000 000		52 237 097	62 570 430
	Total per country	**593 484 047**	**107 865 024**	**336 736 093**	**281 624 884**	**374 355 753**	**305 066 693**	**114 353 044**	**130 288 412**	**948 875 928**	**3 192 649 878**

Data source: European Commission, Cohesion Open Data Platform, European Commission, accessed 19 February 2025.