

REPORT ON CIRCULAR ECONOMY IN ITALY

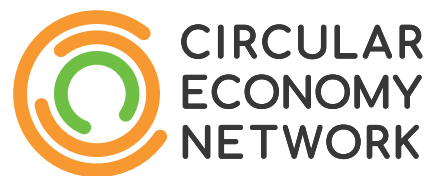
Summary

2026



In partnership with

Ministero delle Imprese
e del Made in Italy



SUMMARY

Report on Circular Economy in Italy 2026

By the Circular Economy Network

Report on Circular Economy in Italy 2026 - Summary

By the Circular Economy Network

Circular Economy Network and Fondazione per lo sviluppo sostenibile

E. Ronchi, S. Leoni, F. Vigni, D. Cancelli, L. Galli, V. Di Mario.

ENEA

C. Brunori, T. Beltrani, C. M. Cellamare, C. Chiavetta, D. Claps, S. Cortesi, R. De Carolis, V. Fantin, M. Jorizzo, M. Iorio, D. Fontana, F. Forte, D. Mattioli, M. Langone, L. Petta, L. Sciubba.

Graphic design and layout

D. Grossi

CIRCULAR ECONOMY NETWORK

The Circular Economy Network is an initiative promoted by the Fondazione per lo Sviluppo Sostenibile, with the participation of companies and organizations, which carries out the following activities regarding the circular economy:

- constant updates and information on national and European regulations;
- engagement with institutions at various levels (national and European) and with relevant stakeholders, through meetings, thematic forums, and an annual National Conference;
- analysis, research, and study, including the publication of an Annual Report.

www.circulareconomynetwork.it

www.fondazionevilupposostenibile.org

c/o Fondazione per lo Sviluppo Sostenibile

Via Garigliano 61/A, 00198 Roma

info@circulareconomynetwork.it

Circular Economy Network Promoters



Member of the Circular Economy Network

Acciaierie Arvedi, AgriBiom, AIRA, AIRP, Ambiente spa, Ass.I.E.A, Assoambiente - sez. Unicircular, Assocarta, Assovetro, Biorepack, Buy Circular, Circularity, CNA, COMIECO, CONOE, COREPLA, DNA Ambiente, Ecocerved, Ecopneus, Ecotyre, ERICA soc. coop., Consorzio ERP Italia, ESO società benefit arl, Eventi di Cartone, Ferrovie dello Stato, Lucart, Mercatino, Mercato Circolare, Safimet, SISEA SRL - Logistica e Ambiente, Tramonto Antonio - Servizi per l'ambiente.

The partial or total reproduction and/or dissemination of the data and information contained in this Report is permitted only with full citation of the source: Circular Economy Network, Rapporto sull'economia circolare in Italia 2026.



A Strategic Challenge for Europe and Italy in the New Global Context

In the new global context, characterized by wars and growing geopolitical instability, the European Union, one of the world's leading economies, is heavily dependent on third countries, not only for oil and gas supplies, but also for raw materials. This dependence translates into vulnerability, both due to price volatility and security of supply, particularly for several strategic raw materials essential to industrial and technological development.

Reducing waste, saving, and promoting efficient use of limited resources have always been good practices, both for minimising environmental impacts and for economic efficiency. However, in the current scenario, these actions become indispensable for countering the repercussions that geopolitical conflicts have on our economies and our well-being. The path to decoupling development from growth in raw material consumption has long been identified: the transition from a linear to a circular economic model must become a cornerstone of European industrial policy, capable of ensuring, together, greater economic competitiveness, greater security of supply, and ecological and climate sustainability.

For Italy, a country characterised by above-average import dependency within the EU, yet also by excellent circularity performance, the transition represents both a necessity and a strategic opportunity that must not be missed. In this Report, we present an updated overview of European policy measures and of the ongoing progress towards a more circular national economy.

The European Union continues to play a leading role in developing policies for the circular economy. The strategic and regulatory framework developed under the Circular Economy Action Plan and the Green Deal has helped guide Member States' policies and to promote greater resource efficiency.

Despite these efforts, the measures taken remain insufficient. The measures adopted have produced positive, albeit partial, effects: despite a significant increase in recycling and a reduction in disposal, overall waste generation remains high. Similarly, consumption of raw materials, largely imported, remains substantial.

At this pace, the European Union will not reach the target of a circularity rate of at least 24% by 2030 but will remain far from it. A decisive step change is needed. The EU and its Member States must both accelerate the implementation of measures already adopted and launch new and more effective initiatives, starting with the Circular Economy Act.

Towards the Circular Economy Act: 10 CEN proposals to accelerate circularity and resilience of the European economy

- 1 Single market for secondary raw materials.** Regulatory differences between Member States hinder the circulation of recycled materials and increase costs for businesses. It is necessary to harmonise definitions and criteria for End of Waste and by-products, simplify procedures, and establish automatic mutual recognition to foster a genuine European market for secondary raw materials.
- 2 Revision of the WEEE Directive.** Collection and recovery rates for electronic waste remain insufficient relative to their strategic value. More targeted objectives must be introduced, collection systems must be strengthened, and adequate resources must be allocated to develop the recovery of critical and strategic raw materials.
- 3 Circular product design.** Circularity must be integrated into the design phase. The implementation of the Ecodesign Regulation must be accelerated, with clear criteria for durability, reparability, and recyclability, along with incentives for products and business models that extend the useful life of goods.
- 4 Extending and harmonising the EPR.** Extended Producer Responsibility must be expanded to more supply chains and made more uniform across the Europe. The introduction of eco-modulation systems can orient the market toward more sustainable products and strengthen prevention and quality collection.
- 5 Fiscal incentives for circularity.** Fiscal mechanisms must support the competitiveness of circular models. In particular, the introduction of reduced VAT rates for repair, reuse, and reconditioning within the European single market can encourage the adoption of sustainable practices and new consumption models.
- 6 Public procurement as a demand lever.** Public demand can play a decisive role in development of circular markets. It is necessary to introduce binding criteria that favor recycled materials, remanufactured products, and services oriented towards durability and reuse.
- 7 Industrial collaboration and supply chain platforms.** The transition requires greater collaboration among actors throughout value chains. Platforms and industrial alliances can facilitate integration between production, recycling, and the use of secondary raw materials in key sectors, such as packaging, textiles, and consumer electronics.
- 8 The role of cities and regions.** Local authorities are central to developing infrastructure, skills, and demand for circular solutions. Their role must be strengthened, and they must be equipped with tools to monitor and improve circularity performance at the territorial level.
- 9 Finance and investment for circularity.** Capital markets often underestimate the potential of investments in the circular economy. Blended public-private finance instruments and greater market transparency can facilitate the mobilisation of capital and promote investment.
- 10 International cooperation and circular trade.** Circularity must be integrated into European trade policies to avoid competitive distortions. Greater international alignment on standards, metrics, and regulations can foster the development of circular value chains on a global scale.

Policies and measures for a more circular economy in Europe and Italy

In 2025, the EU strengthened its circular economy policy framework by adopting significant regulatory and strategic measures: the revision of the **Waste Framework Directive**, which introduces EPR for textiles and binding targets for the reduction of food waste; and the **Packaging Regulation**, which establishes new requirements to strengthen circularity. In addition to primary legislation, delegated acts on **battery recycling and ecodesign** were also adopted, including a ban on the destruction of unsold textiles and new design requirements. The **ESPR Work Plan 2025-2030** and strategic projects on **critical raw materials** aim to strengthen upstream intervention, while initiatives on plastics, regulatory simplification, and End of Waste criteria aim to improve the functioning of the secondary raw materials market.

In 2026, the focus shifts to operational implementation. The Ecodesign Regulation enters a crucial phase, with the **introduction of the Digital Product Passport (DPP)**, set to become mandatory by 2030, and the ban on the destruction of unsold textiles. Member States must also transpose the **Directive on the right to repair** and give effect to the Packaging Regulation, along with the **new rules on consumers and greenwashing**.

Implementation of the Critical Raw Materials Regulation and the Waste Framework Directive is ongoing, while the final adoption of the **End-of-Life Vehicles Regulation** is expected, as well as the development of new initiatives such as the **Advanced Materials Act** and the **Bioeconomy Strategy**. At the same time, the European industrial policy framework is being reinforced (from the Green Deal Industrial Plan to the Industrial Accelerator Act), but the issue of financial resources remains unresolved, still insufficient to meet estimated needs.

In Italy, the central reference for these measures is the **National Strategy for the Circular Economy (SEC)**, updated in 2025, with the integration of new objectives into the timeline through 2027. These include the enhancement of the digital waste traceability system (RENTRI), incentives for recycling and the use of secondary raw materials, the extension of Minimum Environmental Criteria in public procurement, and new End of Waste decrees. However, critical issues remain in the implementation capacity and coordination with economic and industrial policies.

The **National Plan for Sustainable Consumption and Production** is being developed in 2026, incorporating measures on ecodesign, the right to repair, industrial symbiosis, bioeconomy, and eco-districts, as well as interventions on waste taxation.

The **National Recovery and Resilience Plan** play a significant role, with over 1,100 funded projects (including 151 flagship projects) for waste management facilities and recycling chains. However, expenditure remains low (approximately 17% as of October 2025) and some financial allocations have been reduced (plants, flagship projects, biomethane), highlighting difficulties in completing interventions within the 2026 deadlines.

On the regulatory front, notable developments include the 2025 Simplification Law on waste and EPR, implementation of RENTRI, transposition of the European Battery Regulation and the strengthening of CAM, particularly for the construction sector. In parallel, developments in the End of Waste framework are under way (construction aggregates already updated and new decrees in preparation for plastics, textiles, wood, chalk and other sectors).

EPR systems are also evolving, with the extension to e-commerce and the planned introduction of new regimes for textiles (from 2026) and non-packaging plastics. Significant challenges remain, however, particularly regarding WEEE and full compliance with European standards, which is the subject of an infringement procedure.

On the industrial policy front, the **Transition 5.0** initiative has revealed **significant limitations in coherence and effectiveness**, while the need to permanently integrate circularity into industrial strategies is emerging. The main challenge remains to move from a broad but fragmented set of measures to an effective and coordinated implementation, capable of generating concrete impacts on the productive system.

Circularity performance in Europe: Italy's leadership

Figure 1 Source: Circular Economy Network elaboration
Circularity ranking among the 27 EU countries

	Circularity Index	Production and consumption	Waste Management	Secondary raw materials	Competitiveness and innovation	Ecological sustainability and resilience
The Netherlands	69,3	88	78	100	56	39
Italy	65,0	72	88	65	37	63
Belgium	59,6	55	86	68	52	41
Germany	58,8	56	75	43	53	59
Slovakia	58,4	58	77	35	29	82
France	57,9	60	62	53	38	75
Estonia	57,7	44	56	61	63	66
Czech Republic	55,1	50	69	43	40	68
Latvia	54,6	53	70	18	40	74
Spain	54,0	70	65	19	34	64
Austria	53,9	32	65	44	62	62
Slovenia	51,7	52	68	28	30	68
Lithuania	50,5	45	63	9	52	63
Croatia	48,9	51	50	15	40	71
Poland	48,8	58	47	20	35	69
Sweden	48,7	49	52	29	26	77
Luxembourg	46,7	39	67	30	83	6
Hungary	46,4	61	27	19	29	81
Portugal	45,5	49	48	5	29	75
Bulgaria	40,0	40	20	12	26	88
Finland	39,6	23	43	2	44	67
Malta	38,3	57	30	55	36	22
Romania	36,7	40	0	0	29	97
Denmark	36,7	24	65	26	39	23
Cyprus	36,5	28	51	13	24	54
Greece	34,6	56	24	12	3	67
Ireland	34,1	41	38	2	40	32

The circular economy performance of the 27 EU Member States is measured through a ranking (heat-map) based on five synthetic indicators reflecting the dimensions of the EU Monitoring Framework, in addition to an overall index. The scoring scale is associated with a color gradation: dark green indicates excellent results, while red indicates the most critical performance.

Italy confirms its position as the European leader in circularity, ranking second overall behind the Netherlands and ahead of Belgium and Germany (fourth). Significant results are also observed for Slovakia, Estonia, and the Czech Republic, driven by good performance in waste management and ecological sustainability.

On the contrary, the greatest critical issues are found in some countries in the Mediterranean area (Greece, Cyprus, and Malta) and in Eastern Europe (Romania and Bulgaria). The performance of Denmark and Finland is also surprisingly underwhelming, penalised primarily by high material consumption and limited use of secondary raw materials in production cycles.

An overview of circularity in the four main European countries

Production and Consumption

Over the past 50 years, **the volume of materials used globally has more than tripled** and continues to grow at an annual rate of 2.3%.

In Italy, the total value of **processed raw materials** amounts to approximately 766 Mt: the majority derives from domestic extraction (44%) and imports (38%), with the remaining 18% coming from recycling and backfilling.

Italy's **material footprint**, which measures the environmental impact generated both within and beyond national borders, was 10.1 t/capita in 2024, below the EU average of 13.7 t/capita and 2.4% lower compared to 2019. A comparison of the four major EU economies in 2024 shows that Italy (10.1 t/capita) and Spain (10.2 t/capita) have the lowest material consumption, placing them well below the EU27 average of 13.7 t/capita, while France (12.9 t/capita) and Germany (11.7 t/capita) record higher values, although they also remain below the EU average.

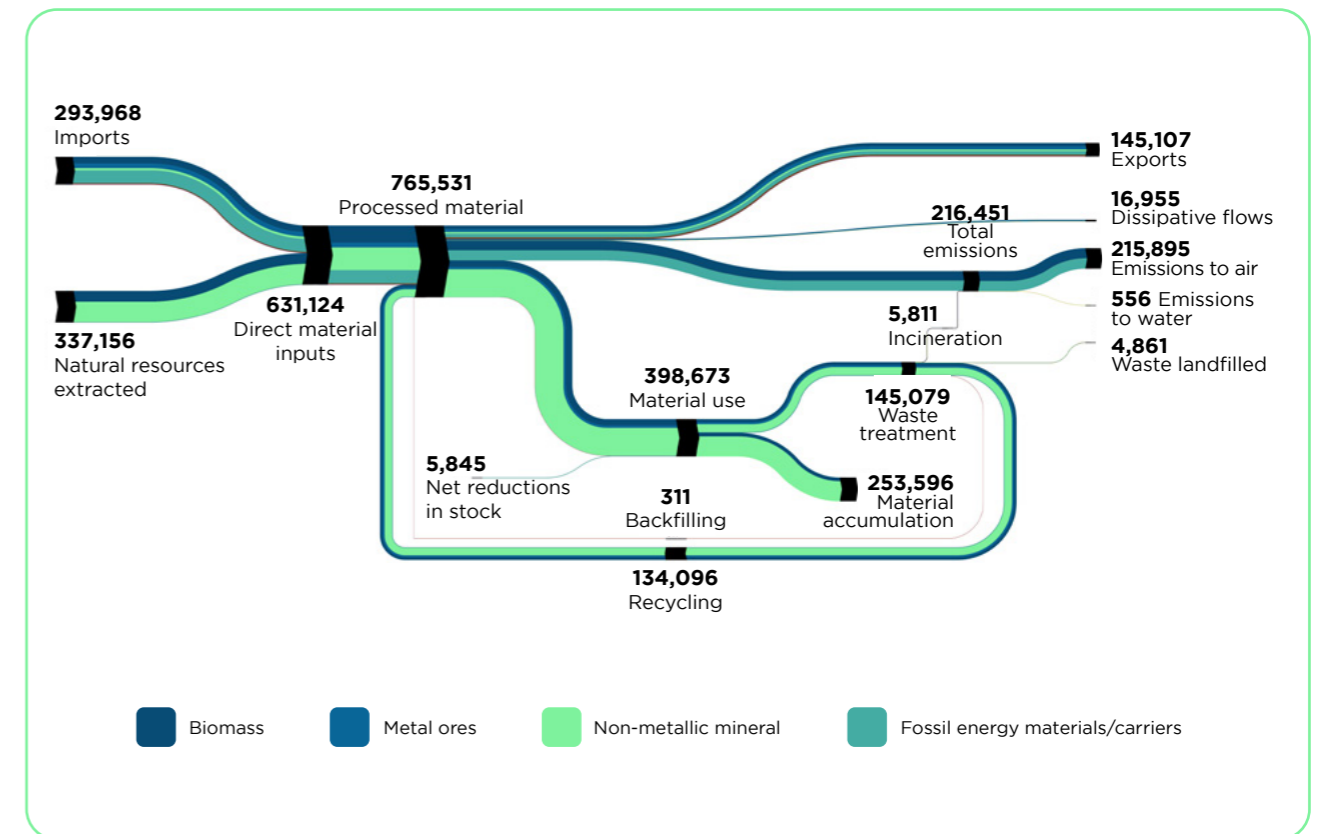
Resource productivity in the EU, measured by the ratio of GDP to material consumption, has grown by 52% since 2000. In 2024, Italy confirmed its leading position with 4.7€ of GDP per kg of resources (a 32% increase compared to 3.6/kg in 2019), significantly exceeding the EU average of 3/kg. Spain and Germany (both at 3.9/kg) and France (3.6/kg) follow. Trend analysis highlights widespread progress. Specifically, Germany recorded growth of 45%, followed by France with 37%. Spain's performance is also noteworthy, with a 27% increase in resource productivity over the same period, despite a slight 1.5% decline in the most recent year.

In the EU27, **per capita municipal waste generation** in 2024 stands at 517 kg/capita. In Italy, this figure has grown by 0.9%, rising from 503 kg/capita in 2019 to the current 508 kg/capita.

Among the major economies, Germany (628 kg/capita) and France (530 kg/capita) exceed the EU average. Italy, at 508 kg/capita, is below the EU threshold, followed by Spain at 456 kg/capita. Analysing the six-year trend, an increase in waste generation is observed both in the EU average (2.4%) and in Germany (3.1%); conversely, France and Spain have seen a decline of 4.5% and 3.4% respectively.

Figure 2 Source: Eurostat

Material flow diagram for Italy in 2024 (kt)



Waste Management

The municipal waste recycling rate in Italy increased by 4.5% between 2019 and 2024, reaching 52.3%. To meet the target set by Directive 2018/851/EU, the country must reach 55% by 2025 and 65% by 2035.

In comparison with major EU economies, Italy exceeds the European average (48.1%), alongside Germany, the leader at 66.9%, while Spain (42.5%) and France (40.9%) lag behind. Analysis across the entire Union reveals significant disparities: rates range from a minimum of 12.4% in Romania to the excellent performances of Germany, Austria, and Slovenia, all exceeding the 60% threshold.

The recycling rate for total managed waste shows that Italy recycles 85.6% (137 Mt) of 160 Mt of waste treated, significantly exceeding the EU average of 41.2%. The gap with other major European economies is more than 30 percentage points: Spain recycles 54.7% and France 52.3%.

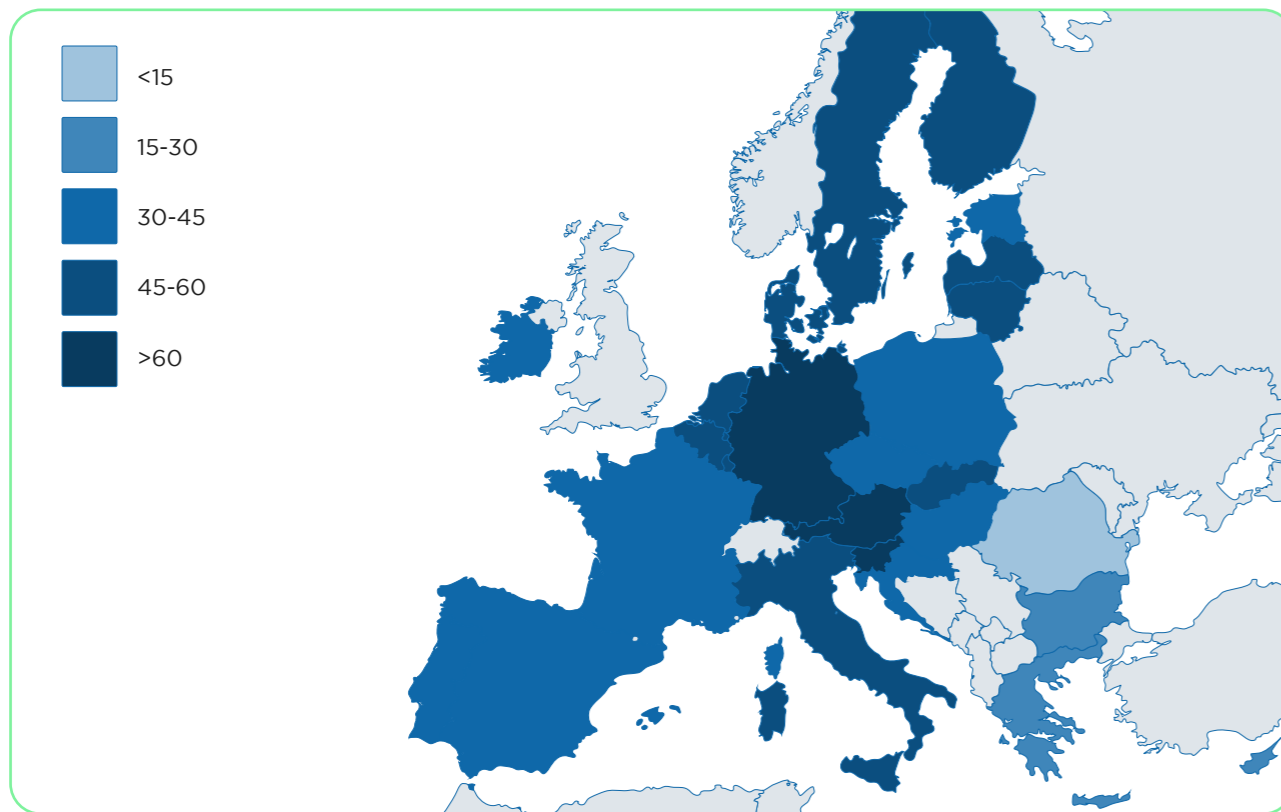
Significant, too, is the comparison with Germany, which despite recycling 163 Mt in absolute terms, records a lower recycling rate (44.4%) due to a total waste output roughly double that of Italy.

In 2023, **the packaging waste recycling rate** in Italy was 75.6%, more than seven percentage points above the EU27 average of 67.5%. The latest CONAI data also indicate further growth in 2024, with the recycling rate rising to 76.7%.

All four major EU Member States have exceeded the EU average for packaging recycling. Of these, Italy holds the top position with the highest rate, followed by Spain at 70.5%. Germany and France trail behind, recording rates of 69.4% and 69% respectively.

Figure 3 Source: Eurostat and ISPRA (Italy)

Municipal waste recycling rates in EU27 countries, latest available year (%)



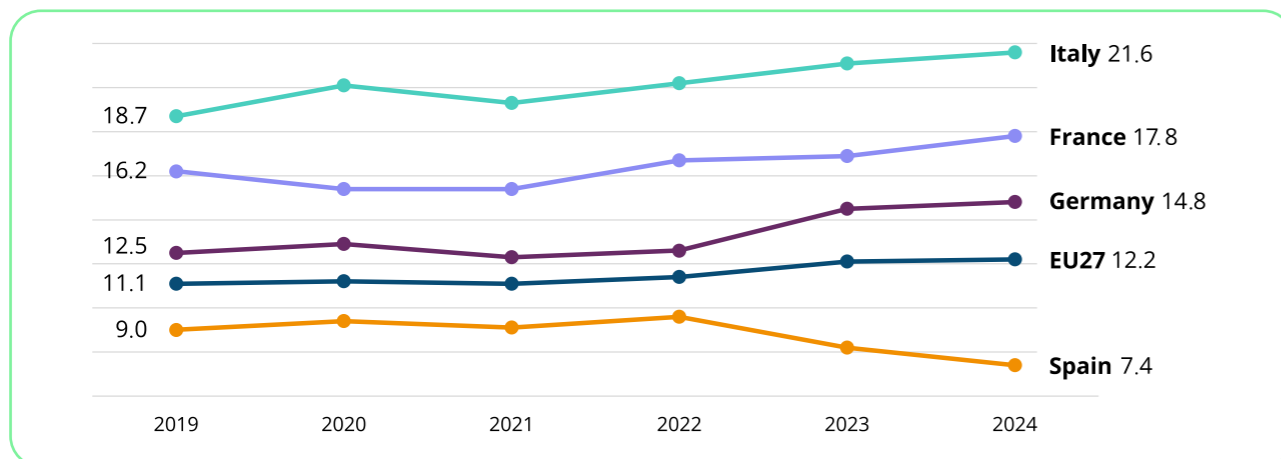
Secondary Raw Materials

The **Circular Material Use (CMU)** rate is defined as the ratio between the use of secondary raw materials generated through recycling and total material consumption. In 2024, Italy once again confirms its leading position in terms of circularity rate, with 21.6% of secondary raw materials from recycling in total material consumption, an increase of 2.9 percentage points compared to 2019.

Over the same period, the EU27 average rose only marginally, from 11.1% to 12.2%. Among the major European economies, Italy maintains its leadership, followed by France (17.8%) and Germany (14.8%). Spain records a value of 7.4%, placing it below the European average and making it the only country in the group to have experienced a decline over the period under review.

Figure 4 Source: Eurostat

Circular Material Use rate in the four main European countries, 2019-2024 (%)



Competitiveness and Innovation

This indicator monitors **private investments** in tangible assets for typical circularity activities, such as recycling, reuse, repair, rental, and leasing. In 2023, the European Union invested a total of 130.6 billion (0.8% of GDP), while Italy invested 10.2 billion (0.5% of GDP), representing a contraction from 13.1 billion (0.7% of GDP) in 2019. Among the major European economies, Germany leads the ranking in absolute value with 39.5 billion, followed by France (22.5 billion), Italy and Spain (7.6 billion). However, the period 2019-2023 reflects a widespread negative trend: with the exception of Spain, all countries recorded a decrease in investments relative to their own GDP.

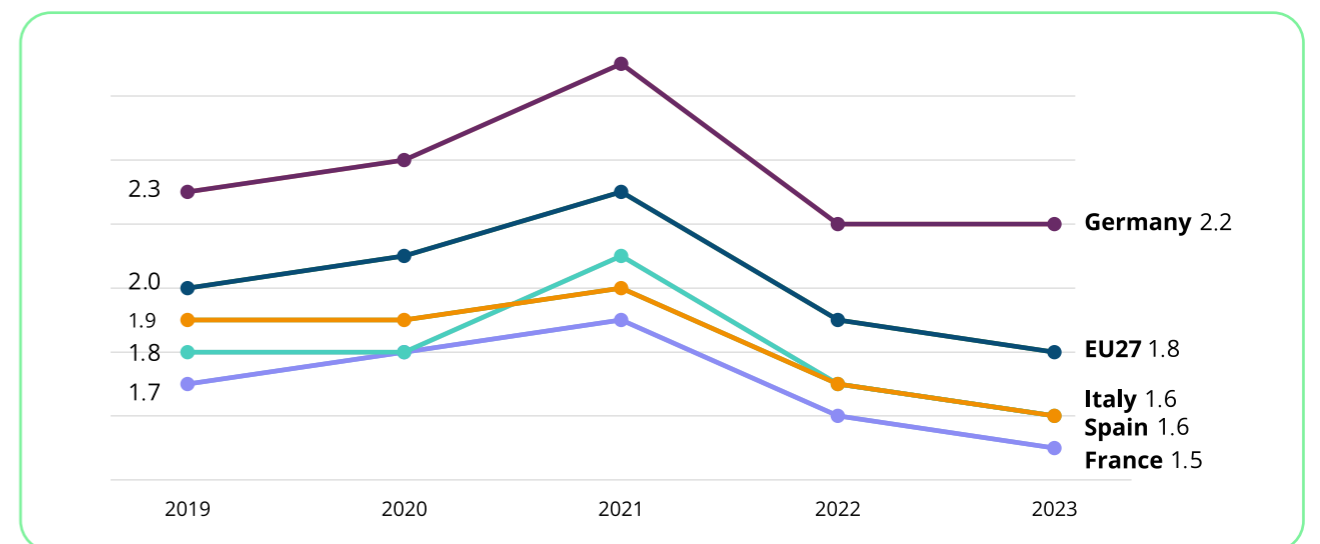
Between 2019 and 2023, **employment** in activities typical of the circular economy in the EU27 fell by 2%, from 4.5 to 4.4 million workers. Among the four major European economies, Germany holds the highest number of workers in absolute terms (772,000, +1% compared to 2019), followed by France (537,000, stable), Italy (508,000, -7%), and Spain (428,000, -7%). However, when analysing the percentage share of total employment, the picture changes: Italy, at 2%, aligns perfectly with the EU27 average and Spain's figure. Both countries outperform the other major economies considered, France (1.8%) and Germany (1.7%).

The **value added** generated by the European Union in 2023 from activities typical of the circular economy was 316 billion, equivalent to 1.8% of total economic output; in Italy, it amounted to 34.5 billion, or 1.6% of the total, below the EU figure. Over the reference period (2019-2023), Italy's value added grew in absolute terms (from 32.9 to 34.5 billion) but declined as a share of GDP, falling from 1.8% in 2019 to 1.6% in 2023. This declining trend in value added relative to GDP was also observed in the EU27 as a whole, as well as in Germany, France, and Spain.

Monitoring the number of **patents related to recycling and secondary raw materials** is a key driver for the transition to a circular economy. In 2021, the European Union recorded 0.73 patents per million inhabitants, in line with 2017 but below the peak reached in 2020 (1.01). In this context, Italy demonstrated growth of 16.5% over the period 2017-2021, rising from 0.55 to 0.64. Among the major European economies, Germany remains the leader with 0.95 patents per million inhabitants in 2021, while Spain, despite starting from a lower value, recorded an overall improvement from 0.28 to 0.47. In contrast, France suffered a more marked decline, falling to 0.48 patents per million inhabitants.

Figure 5 Source: Eurostat

Value added at factor cost in activities typical of the circular economy in the four main European countries, 2019-2023 (% of GDP)



Ecological Sustainability and Resilience

The **consumption footprint**, which assesses the environmental impacts of consumption in the EU and its Member States, reached an index of 106 in Europe in 2023 (base 100 in 2010), reflecting a 6% increase over the long term but a 3% decline compared to 2022.

Italy stands out positively: in 2023, its index (100) is below the European average and has fallen by 3.8% compared to 2019. It is the only major EU economy to have reduced this value over the past five years, while Germany has remained stable and France (0.9%) and Spain (8.5%) have seen increases, with the latter recording the highest value (115).

In 2024, **per capita greenhouse gas emissions generated by production activities** in the EU27 amounted to 5,837 kg CO₂ eq, while Italy recorded a figure below the European average at 4,795 kg CO₂ eq, a marked reduction of 10.9% compared to 5,384 kg in 2019.

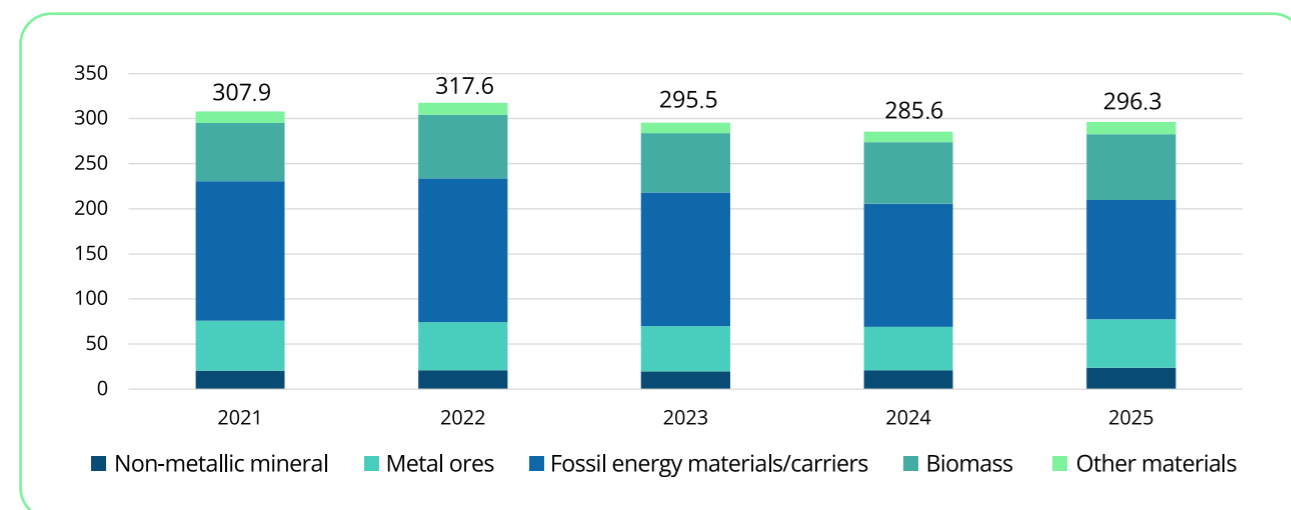
Among the four major EU economies, France (4,449 kg CO₂ eq) and Spain (4,416 kg CO₂ eq) recorded slightly lower values than Italy, while Germany reported a significantly higher figure of 6,348 kg CO₂ eq. However, analysing the trend over the period 2019-2024, a clear downward trajectory emerges for all countries analysed, with particularly marked contractions in Germany (-19%), Spain (-17%), and France (-15%).

In 2024, Italy's **dependence on imported materials** declined to 46.6% (-2.3 percentage points compared to 2019). Despite this improvement, Italy remains the most exposed country to foreign supply among the major European economies, significantly exceeding the EU average (22.4%) and the values of Spain (39.8%), Germany (39.5%), and France (30.8%). Although all countries analysed have recorded a downward trend, the most significant performance belongs to France, with a reduction of 6.1 percentage points, followed by Italy (-2.3), Spain (-2.0), and Germany (-1.9).

More specifically, Italy maintains a high degree of vulnerability in resource procurement. Although the total volume of material imports has declined, standing at 296 Mt in 2025, the overall economic expenditure on imports approached 600 billion euro (+23.3% compared to 2021).

This gap highlights a sharp increase in unit values that affects not only energy products (whose import volumes fell by 14%), but also metals. The cost of the latter, including strategic materials such as nickel, copper, and steel, has increased by 18% and accounts for 40% of the total value of national imports.

Figure 6 Source: Circular Economy Network elaboration based on Istat-Coeweb data
Trend in material imports in Italy, 2021-2025 (Mt)



The role of cities in developing the circular economy in Italy

Interest in local action on circularity policies has, over the years, prompted the launch of several initiatives across Europe and Italy. Under the 2020 EU Circular Economy Action Plan, the European Commission launched the **“Circular Cities and Regions Initiative”** (CCRI), funded by Horizon 2020 and Horizon Europe, as well as the EU’s research and innovation framework programs, which provides support to local and regional circular economy initiatives. At the initiative of ENEA, **the Italian Circular Economy Stakeholders Platform (ICESP)** was established in 2018 as a national interface to the European ECESP. The aim is to strengthen Italy’s role as a key country for the promotion, implementation, and dissemination of high-value circular strategies. To date, 52 organisations have signed the ICESP Charter and 120 participate in its working groups, one of which is dedicated to Circular Cities and Territories.

The **OECD** periodically publishes **reports on the circular economy in EU cities and regions**, focusing on the interconnected drivers of circularity, including environmental imperatives, economic growth and supply chain resilience, technological progress and R&D, regulatory and policy frameworks, employment, and social engagement. In the latest report, “The Circular Economy in Cities and Regions of the European Union”, published in 2025, the OECD surveyed territorial realities across the EU, grouping cities and regions into three categories (strategy-oriented, innovation-oriented, and partnership-oriented) in order to highlight common characteristics and present examples of ongoing circular economy practices.

In this context, in 2025 the Fondazione per lo Sviluppo Sostenibile established an **Observatory on the Ecological Transition of Cities**, bringing together representatives from a group of Italian municipalities, ENEA, ISPRA, several universities, the State Property Agency, and various economic actors. A dedicated working group on “Interventions for Greater Circularity in Cities” aims to collect and disseminate best practices implemented by cities, not only in Italy.

Italy has adopted a wide range of programs and plans related to the circular economy. These strategies and plans encourage local authorities to take action to achieve the relevant objectives. The **National Strategy for Sustainable Development**, updated in 2022, aims to activate and support local authorities in defining sustainable development agendas, extending collaboration to include wider areas and “homogeneous” territorial systems based on geographic, environmental, and socio-economic criteria (e.g. mountain areas, river basins, inner areas, with priority given to fragile zones), in order to implement multidimensional and innovative interventions capable of integrating different policy sectors.

The **National Waste Prevention Programme** underscores the importance of synergistic collaboration with regional and municipal authorities, which are in turn engaged in local planning for waste prevention and management.

The **National Strategy for the Circular Economy** identifies themes and areas of intervention that

require direct commitment from municipalities, such as reuse centres, urban regeneration, green procurement, citizen awareness-raising, sharing economy promotion, the valorisation of repair services, service dematerialisation, and water reuse. Municipalities can take numerous actions within this framework; however, they must take into account the broader context and understand the priorities.

Best practices for the circular economy in cities

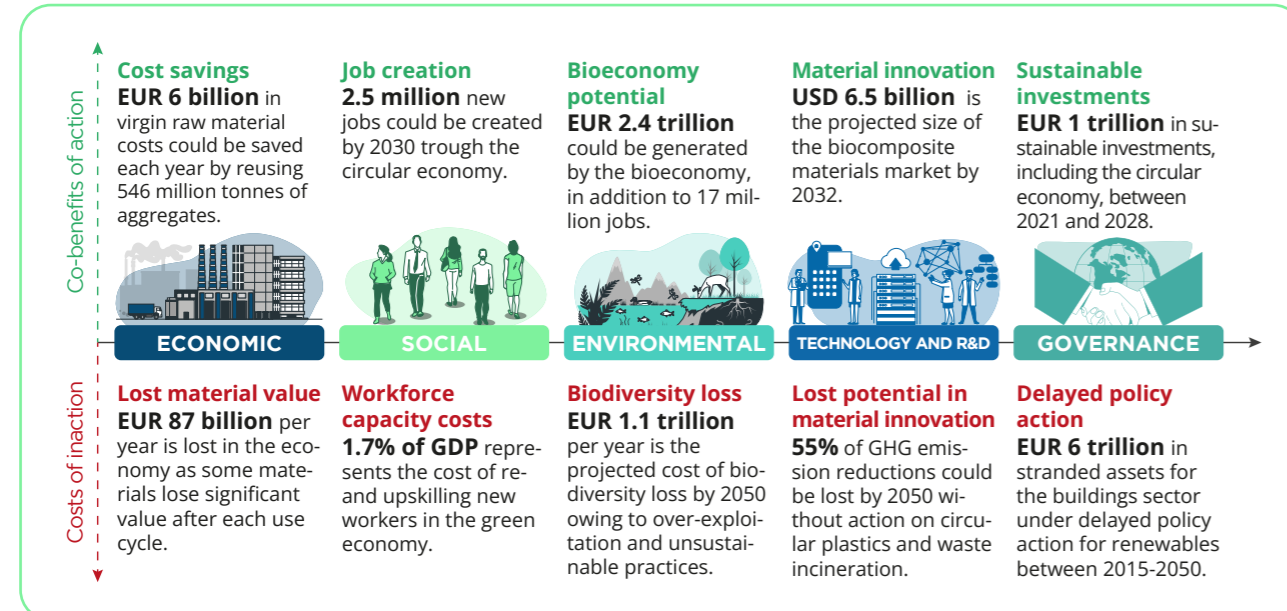
The transition towards a circular economy model in EU cities and regions is driven by several interconnected factors. According to the results of the 2025 OECD survey, which involved 48 cities, 15 regions, and 1 province from 21 countries, including EU27 Member States, the United Kingdom, and Norway, the main drivers of the circular economy transition include **climate change, economic growth, private sector initiatives, and job creation**.

Based on the survey responses and key macro-trends, five **key factors** driving the circular economy in cities and regions: environmental constraints, economic growth and supply chain resilience, market and employment opportunities, technological development and R&D, and regulatory frameworks and social engagement.

Because **these factors can interact or conflict, establishing priorities is essential**. The following provides examples of impacts (positive and negative) at the European level, comparing the costs of inaction with the benefits of adopting a more circular model.

Figure 7 Source: OECD

Overview of the main costs of inaction and co-benefits of the circular economy in Europe



Nearly half of the cities and regions surveyed have adopted a dedicated circular economy strategy. **75% of the cities and regions surveyed reported having circular economy initiatives in place**, representing a significant advance compared to 2020, when, according to a previous OECD report, only a third had adopted circular economy measures. Furthermore, 47% of respondents have allocated a dedicated budget for the circular economy. The report also documents a series of good practices adopted by local governments.

Regarding best practices on the circular economy in Italian cities, reference is made to the Report of the Observatory on the Ecological Transition of Cities, to be presented in June 2026.

The Circular Economy in Water Resource Management

The growing pressure on natural resources, amplified by climate change and geopolitical tensions, is prompting the European Union to fundamentally rethink its relationship with water and non-energy raw materials. These elements are increasingly interconnected and central to Europe's industrial competitiveness, economic security, and social stability.

On the raw materials front, the EU has embarked on a regulatory trajectory aimed at promoting and fostering greater self-sufficiency in supply.

From the **European Raw Materials Initiative** of 2008, through successive lists of critical (CRM) and strategic (SRM) raw materials, this process culminated in the **Critical Raw Materials Act**, which entered into force in May 2024. This Regulation sets specific targets for 2030:

- 10% of critical raw materials must be extracted in Europe;
- 40% processed in Europe;
- 25% met through recycling.

To support these objectives, **Strategic Projects** have been established, benefiting from accelerated authorisation procedures and priority access to funding. In the first selection round launched in 2025, 47 European projects were approved, of which 4 are Italian projects dedicated to recycling, representing a total investment of over 22 billion euro.

Equally significant is the impact of the new **Ecodesign Regulation**, which aims to reduce the environmental impacts of products from the design phase onwards, imposing criteria of durability, reparability, and recycled content.

On the water front, the challenge is equally urgent: approximately 30% of European territory is subject to seasonal water scarcity every year, with peaks in southern Europe where over 70% of the population is affected during the summer months. The **Water Resilience Strategy**, adopted by the Commission in June 2025, marks a turning point: for the first time, water becomes the primary mandate of a dedicated European Commissioner. The strategy aims to reduce water consumption by 10% by 2030, promote the reuse of treated wastewater, and valorise sewage sludge as a source of recoverable nutrients, including phosphorus and nitrogen. To support these investments, the European Investment Bank (EIB) has allocated over 15 billion euro for the period 2025-2027.

The strategy must be read in close connection with **EU Directive 2024/3019 on urban wastewater treatment**, which translates many of its objectives into binding obligations for treatment plants, including the extension of treatment coverage to small agglomerations, the introduction of quaternary treatment for the removal of micropollutants, and the achievement of energy neutrality in plants by

2045. For Italy, characterised by significant water shortages, a high dependence on foreign countries for many raw materials, and a fragmented infrastructure system, this paradigm shift is of even greater strategic importance. Upgrading larger Italian treatment plants will require estimated investments of between 800 million and 2 billion euro.

From wastewater treatment to phosphorus recovery

From the perspective of the circular economy applied to water systems, the **treatment plant** is no longer merely a processing facility, it can be reimagined as a genuine source of resources, including reusable water and secondary raw materials. Treated effluents contain residual concentrations of nitrogen and phosphorus that, when directed towards irrigation, cease to be contaminants to be eliminated and become nutrients of value to agriculture. In this sense, **EU Directive 2024/3019**, rather than requiring the systematic removal of nitrogen and phosphorus from the effluent, **opens the way for more flexible management approaches** for these elements, to be assessed on the basis of the intended final use of the effluent itself.

The regulatory framework governing irrigation reuse is established by **EU Regulation 2020/741**. The Regulation sets out a qualitative classification for so-called “refined water” and divides it into four classes (A to D) based on five physicochemical and microbiological parameters. Each refinement is then assigned, according to its quality classification, to a specific crop type and irrigation technique. This allows the reuse of lower-quality water, while ensuring health safety for the most sensitive applications. The same Regulation calls for continuous monitoring of emerging contaminants and microplastics, an aspect further reinforced by the aforementioned Urban Wastewater Treatment Directive through the introduction of quaternary treatment for the removal of organic micropollutants.

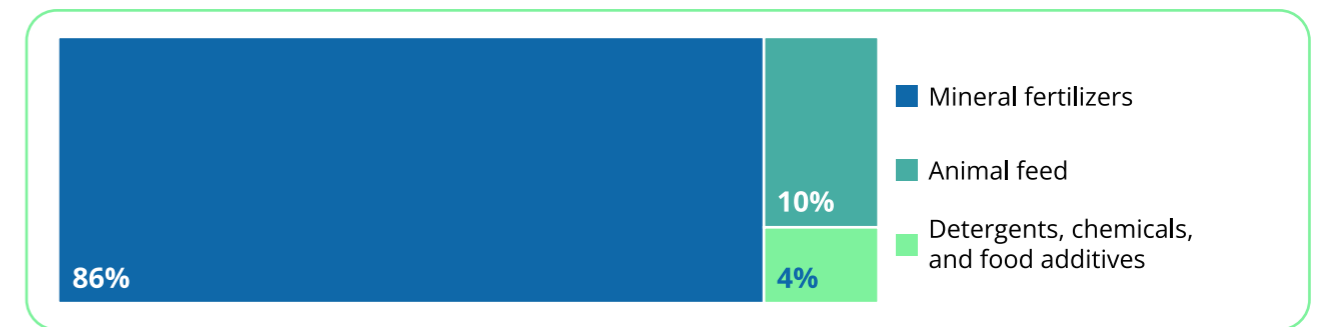
Reclaimed water is suitable not only for agricultural use, but also for civil, industrial, and environmental applications, from the maintenance of public green spaces to the restoration of degraded ecosystems. The potential demand is considerable: of approximately 30 billion m³ of national water demand, 40% is absorbed by agriculture, rising to over three-quarters during summer months. The technical feasibility of reuse has been demonstrated by numerous operational experiences both in Italy and worldwide, yet the challenge of seasonal storage and the increase in summer water demand, against a backdrop of continuous plant production remains open.

Among **the secondary raw materials recoverable from treatment processes**, phosphorus occupies a position of particular importance. Included in the European list of critical raw materials since 2014 (as phosphate rock) and since 2017 also as elemental phosphorus, it is a fundamental element for food security, as an essential component of fertilizers and animal feed, and for the production of chemicals. **European import dependency is very high:** 82% for phosphate rock and 100% for elemental phosphorus. The EU’s main suppliers are Morocco (27%), Russia (24%), Algeria (10%), and Israel (7%), while China dominates global production at 44%. The only significant European producer is Finland (18%).

Given this dependency, the role that recovery activities can play must be seriously considered. Currently, approximately 15% of Europe’s phosphorus input is dispersed in streams that simultaneously represent the best recovery opportunities: primarily sewage sludge and livestock manure, followed by slaughterhouse waste and the organic fraction of municipal solid waste. At present, sludge and manure are largely applied directly to the soil, contributing to a direct if sub-optimal form of recycling, while recovery from municipal solid waste remains largely unexplored. The price of phosphorus is generally stable but can be subject to fluctuations linked to contingent events of national or international significance.

Figure 8 Source: ENEA elaboration based on SCRREEN data

Main applications of phosphorus in the EU (%)



From desalination to magnesium recovery

Desalination represents an increasingly relevant technology for addressing water scarcity, particularly in Mediterranean areas subject to drought and intense anthropogenic pressure. Globally, installed capacity has grown from 5 million m³/day in 1980 to approximately 109 million in 2023, while in the EU, the approximately 1,901 active plants in 2023, with a total capacity of 8.9 million m³/day, represent growth of over 40% compared to 2009. The dominant technology in Europe is reverse osmosis, which has replaced thermal processes due to its greater energy efficiency.

In Italy, desalination has historically played a limited role, although interest in this technology has increased more recently. Current installed capacity stands at approximately 657,000 m³/day, 7.6% of the European total, but the system is highly fragmented, with over 60% of plants below 1,000 m³/day and primarily serving industrial uses.

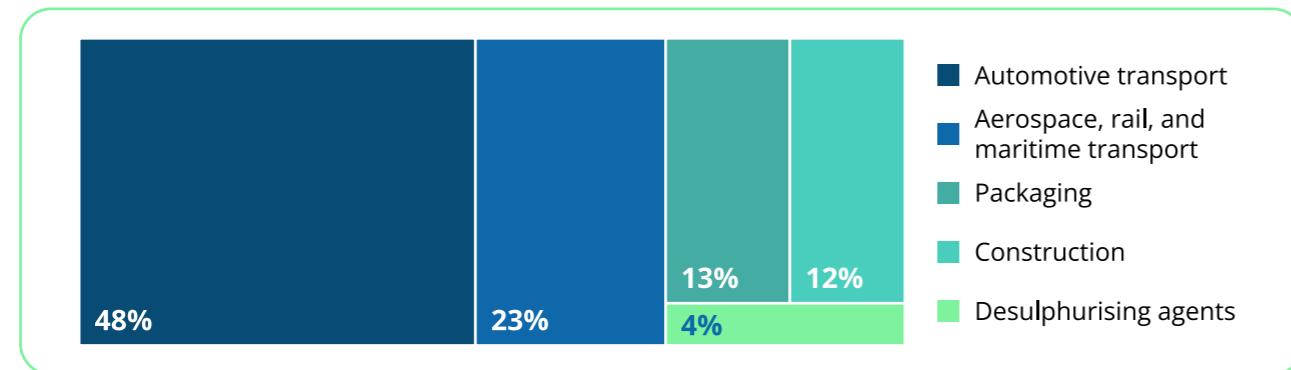
In recent years, a **new approach to brine management has emerged**. Once considered a waste product to be disposed of, it is now being reconsidered as a stream rich in secondary raw materials that can be valorised in accordance with circular economy principles. Elements such as magnesium, potassium, calcium, bromine, and boron dissolved in Mediterranean brines, could have a theoretical market value exceeding 200 € per cubic metre, opening the way to the so-called **circular desalination** model, in which the plant becomes a multi-output infrastructure producing not only freshwater but also material resources. The practical feasibility, however, depends on the scale of the plant, the energy costs of separation processes, the purity required by markets, and the presence of local industrial supply chains. Among the most promising elements, magnesium deserves special attention.

Seawater contains on average 1.29 kg/m³ of magnesium, which in the brine of a plant with 50% recovery can reach approximately 2.6 kg/m³. However, what is recoverable is not metallic magnesium, but rather inorganic species such as magnesium hydroxide, magnesium chloride, or synthetic magnesium oxide, industrial intermediates with well-established applications across various sectors (basic and fine chemicals, water treatment, refractory materials, and others).

Metallic magnesium requires additional high energy-intensity processes, such as the Pidgeon process (metallothermic reduction in vacuum reactors) or the electrolysis of molten salts. Magnesium is classified as a critical and strategic raw material on the European CRM List of 2023, and the EU is totally dependent on imports for primary magnesium, with China accounting for 88% of global production. For magnesite, the EU is self-sufficient thanks to domestic production. Domestic recycling covers between 7% and 13% of magnesium demand. Synthetic magnesite also represents 13% of global total, and magnesia obtained from underground brine is produced exclusively in the Netherlands.

Figure 9 Source: ENEA elaboration based on SCRREEN data

Main applications of magnesium in the EU (%)



Circular solutions for sustainable water management

ENEA is involved in several projects focused on the application of the circular economy to water management.

The **Electric System Research Project 1.11** analyses the water-energy-food nexus, assessing the potential of treated wastewater as a non-conventional resource, studying emerging micropollutants in water intended for reuse, and developing advanced treatment technologies, as well as a GIS methodology for water recovery on smaller islands.

The **SHARE.MedWATER project** (2025-2029, Interreg Euro-MED) involves ten partners from seven Mediterranean countries, supported by eleven associated partners including public bodies, universities, and water authorities, to test circular water management models at seven pilot sites. To scale the solutions, SHARE.MedWATER will develop a Decision Support System (DSS) to evaluate the costs, benefits, and environmental impacts of different reuse options.

In Bologna, under the **NICE project** (Interreg Central Europe, 2024-2026), the pilot project "Acqua in Circolo" has promoted the reuse of rainwater through practical solutions installed in urban settings and educational initiatives in schools.

In the **ECOSISTER project** (PNRR), ENEA has enhanced a prototype installed at the Cesena wastewater treatment plant for real-time monitoring of the quality of wastewater intended for irrigation, in compliance with EU Regulation 2020/741.

Finally, on the island of Ventotene, under the **PNRR "Isole Verdi" programme**, ENEA developed a plan for rainwater recovery through the restoration of ancient Roman cisterns, a replicable pilot case that combines climate adaptation, urban regeneration, and the valorisation of historical heritage.

CIRCULAR ECONOMY NETWORK PROMOTERS



"Water, a strategic production factor for the paper industry, is today at the center of sustainability policies, requiring increasingly efficient and circular use. The integration of ESG principles represents an indispensable condition for ensuring industrial continuity and long-term competitiveness. Burgo Group, through the GO 2030 program, has launched a structured path of evolution of its business model, focusing on technological innovation, the circular economy, and the reduction of environmental impact across the entire value chain. Sustainable management of water resources, optimization of production cycles, and resilience of plants require significant investments and a widespread cultural shift. The future of the sector depends on the ability to adapt, innovate, and create value in a sustainable way."

Valerio Forti, HSE Director Burgo Group



Uliveto and Rocchetta waters make environmental sustainability a concrete commitment that guides every industrial decision. The production plants are powered by 100% certified renewable energy; the bottles, made from 100% recyclable PET, contain rPET and are equipped with tethered caps. The protection of the water sources and participation in the Circular Economy Network complete a strategy focused on promoting a circular economy and building a greener future.



"Sustainability is a choice that shapes the future of both the country and its businesses; it is not an option. In 2024, 76.7% of packaging on the market was recycled. Every tonne recycled reduces reliance on virgin resources, cuts CO₂ emissions and saves primary energy. For this reason, we must continue our efforts to improve both the quality and quantity of separate waste collection, and to promote, now more than ever, the use of secondary raw materials."

Ignazio Capuano, CONAI President



"The CONOU model is a 100% Made in Italy machine that has been working for over forty years, thanks to an efficient and transparent supply chain that transforms a hazardous waste into a valuable resource, generating environmental, economic, and social benefits. It is a concrete example of the circular economy, demonstrating how it can be effective when properly applied. It is no coincidence that our experience is increasingly observed abroad as a virtuous management model."

Riccardo Piunti, CONOU President



"The system has undergone significant evolution. Today, the multi-consortium model, led by an actor capable of safeguarding a shared vision while also respecting the specificities of each supply chain, proves to be the most effective tool available to producers and importers for a more structured approach to waste management. In this perspective, Extended Producer Responsibility (EPR) goes beyond mere regulatory compliance and establishes itself as a driver of innovation, capable of promoting a more balanced, transparent, and efficient system."

Michele Priori, Consorzi Cobat General Director



"Sustainable water resource management and waste valorization play a central role in promoting more efficient and resilient production models, transforming waste into resources, contributing to ecosystem protection, and at the same time supporting the competitiveness of businesses and local communities. For this reason, we develop concrete solutions that generate value for the Country, with the aim of building a more circular system together".

Roberto Ronca, Circular Economy Director Edison Next



"At Erion, we believe that Extended Producer Responsibility is a concrete lever for transformation, capable of protecting the environment and restoring value to materials that are increasingly strategic for the country, in an international context where access to resources and industrial competitiveness are increasingly dependent on circularity. EPR also means supporting companies on measurable and credible sustainability paths, reducing the impact throughout the product life cycle and contributing to more responsible consumption and production models."

**Danilo Bonato, Development and Institutional Relations Director,
Erion Compliance Organization**



"Ecomondo plays a pivotal role in bringing together companies, institutions, professionals, public administrations, and all relevant stakeholders to foster strategic connections and synergies, facilitate business interactions, and stimulate the creation of new market opportunities. It increasingly acts as a global bridge between supply and demand for green technologies and solutions across international markets, positioning Italy at the forefront of the ecological transition."

**Alessandra Astolfi, Global Exhibition Director Green & Technology
division di Italian Exhibition Group Spa**



"In a context marked by persistent geopolitical instability and commodity price volatility, the circular economy stands out as a strategic driver for accelerating the ecological transition and strengthening national self-sufficiency. For Iren, leading this transformation means fostering innovation, anticipating future challenges, and unlocking the value of critical raw materials, thereby advancing a new sustainable industrial model."

Luca Dal Fabbro, Iren Group Chairman



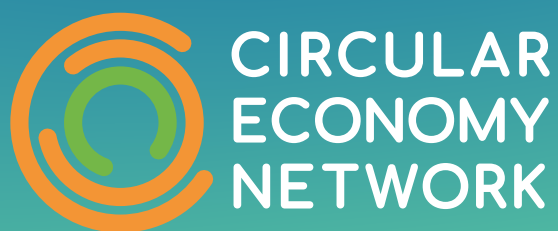
"The decarbonisation goals, a fundamental pillar of European policy, can be concretely achieved by combining innovative technologies with consolidated processes, in full compliance with the Circular Economy. Montello SpA, active for over 25 years in the sector of recovery and recycling of municipal waste from separate collection, will continue its investment program with the aim of maximizing results in environmental, social and governance terms".

Roberto Sancinelli, President of Montello S.p.A.



"For over thirty years, we have been working with conviction in the field of the circular bioeconomy, with the goal of rethinking processes, product use, and end-of-life management. We have scaled our proprietary technologies to an industrial level, building biorefineries capable of utilizing plant-based raw materials and byproducts and transforming them into bioproducts that do not accumulate in water or soil. Today, we are a Benefit Corporation and a B Corp that, by statute, has chosen to operate as a regenerative force, and we continue to integrate chemistry and agriculture, our technologies, and our supply chains toward greater sustainability by promoting participatory innovation and value creation in local communities."

Catia Bastioli, Novamont CEO



SUMMARY

Report on Circular Economy in Italy 2026

By the Circular Economy Network