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Financing circular economy ambitions in Europe: trends and gaps

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Summary

The transition to a more circular economy is recognised as critical in the EU both for the competitiveness of the EU economy and to ensure meeting the EU environmental agenda**.** The EU aims to accelerate the transition to a circular economy, which requires considerable financial mobilisation. It becomes essential to first understand what is considered circular economy by the public and private institutions involved in financing, how investments into circular economy have evolved over time and what the financing gaps are.

A proper and comparable understanding of what is intended by "circular economy" is one of the main barriers for the uptake of financing. The 2020 Circular Economy Action Plan refers to the whole life cycle of products, from design and extraction, to production, use and end of life. This study found that the interpretations of circular economy by related EU policies are aligned. Different related policies, such as those for waste, also include more references to financing, especially in the recent years. On the other hand, the **circular economy definition across financial institutions** lacks congruency, comparability, and comprehensiveness. Sustainable finance policies include considerations of circular economy; however, approaches and definitions are not aligned. Waste and recycling are the easiest identifiable circular activities for the finance sector, while circular activities are mostly sector-agnostic requiring qualitative assessment. Circular economy finance can therefore cover a combination of circular economy activities and specific sectors. Definition of circular economy finance is impacted by available methodologies, indicators, and databases. Hence, to mobilise financing for circular economy projects, financial market players have been using the circular economy considerations within the EU Taxonomy, the sustainable finance disclosure directives, and nomenclature of economic activities. The European Investment Bank (EIB), the EU lending arm, has been using an evolving concept for circular economy projects. Available data on ecolabels is currently very limited to contribute to the financing of circular economy.

Different studies have assessed current investments into circular economy in the EU as well as financing needs and gaps. The values of current annual investments range from **EUR 18 billion** (Platform on Sustainable Finance), to **EUR 120 billion** (EIB and European Commission study), and to **EUR 137.9 billion** (EU Circular Economy Framework methodology)**.** These studies differ in assessment approaches and in scope which signals the need for harmonisation to have comparable results. Independent on definitional inconsistencies which undermine comparability and policy targeting, investment needs remain significantly unmet. Although EU public funding (e.g. EU funding programmes like Cohesion Fund, Just Transition fund, European Regional Development Fund, Horizon Europe, LIFE Programme, Recovery and Resilience Fund) proved to be instrumental for circular economy progress – even without being specifically designed circular economy programmes, – tracking public finance at the national level is still fragmented due to the links of circular economy measures to other environmental objectives and the lack of clarity in definition of circular economy funding. Across the EU, both sectoral and regional imbalances persist in the financing of the circular economy, too. The imbalance in circular economy finance development of EU Member States stems also from differences in institutional readiness and economic structures. Member States' maturity of circular economy policies, environmental considerations in the national budgeting processes, involvement of national development banks, and private finance sector initiatives – all contribute to evolvement of circular economy finance, as country case studies prove. Data availability and quality vary depending on the source, the maturity and standardisation of particular market instruments, with blind spots remaining unresolved, as analysis of current assessment methodologies shows. To support strategic decision-making and to enable progress in the underdeveloped circular economy activities

(like circular design), shifting the focus from established and monitorable activities (like waste recycling) is needed. For that monitoring frameworks need further evolvement.

The EU circular economy goals require substantial new capital, driven by the ambition of the EU Circular Economy Action Plan (CEAP 2020) and related regulations, corporate strategies, technological innovation, and societal and market shifts. These drivers influence the scale and composition of capital required across circular strategies along the value chain. The assessment of the investment gap for circular economy in the EU goes up to **EUR 1.2 trillion** in cumulative investments by 2040 (EIB and European Commission study)**.** Capital-intensive after-use solutions (mostly recycling), service-based models with delayed revenue, circular design interventions with long payback periods, and sufficiency-based approaches, all present different financial profiles. Scaling pathways also influence investment needs. Replication requires flexible and context specific instruments, mainstreaming requires blended and risk reducing finance, and deeper behavioural change requires institutional learning within finance. Innovative solutions are needed to address market failures and barriers to circular economy financing. Adapted risk assessment approaches that recognise circular economy business models are a common enabler for financing circular projects. The thematic deep dives into financing circular start-ups and Product-Service Systems (PSS) within this study illustrate specific investment gaps and solutions and allow for a refined discussion of implications for businesses, policy makers, and the finance sector.

The insights from this report, including the analysis of the definition, current investments, future needs, and investment gaps in circular economy finance, also support the **enhancement of metrics for the monitoring of the financing of the circular economy.** The Circularity Metrics Lab of the European Environment Agency provides an exploratory platform, where currently finance related metrics remain limited. The only existing indicator, based on circular lending, by the European Investment Bank can be strengthened through greater disaggregation (e.g. by time, country, and circular business model typology). New data emerging from sustainable finance legislation offers potential for more structured and comparable finance metrics once reporting cycles mature. Complementary sources, such as commercial financial databases and natural language processing of disclosures, provide further opportunities to address current data gaps. This report includes a phased indicator development pathway that can support more systematic monitoring of circular economy finance.

1 Introduction

Europe continues to operate under a predominantly linear material flow model (EEA, 2024a). The transition to a more circular economy is recognised as critical in the EU. It extends beyond increasing recycling rates and improving waste management: it is about reducing the demand for materials and its associated impacts over the whole life cycle of products through strategies or touchpoints such as ecodesign, more resource efficient production, responsible consumption, and extending product life spans (EEA, 2024a). This requires fundamental changes in business models, practices, and behaviours.

The EU's Circular Economy Action Plan (2020) states that decisive measures must be put in place to steer finance towards more sustainable production and consumption patterns. Harnessing the potential of EU financing instruments and funds to make circularity work for people, regions, and cities is one of the ways suggested by the Circular Economy Action Plan for steering finance. The Plan also addresses the deployment of the EU sustainable finance framework, incorporating circularity within the EU Taxonomy Regulation and advancing preparatory work on EU Ecolabel criteria for financial products (EC, 2020a). Thus, the sustainable finance agenda includes several measures aimed at redirecting investments from a linear to a circular economy, addressing the slow growth of investments in the circular economy and the existing imbalance favouring waste management. While data on investment in waste management is available, information on other investments in the circular economy remains limited. Furthermore, the increase in the number of national strategies is expected to mobilise additional financial resources for the circular transition. However, knowledge on actual investments in the circular economy and its financial needs remain scarce (EEA, 2025).

Recent developments further emphasise the strategic importance of the circular economy for the EU. In 2024 the European Commission tasked Mario Draghi, former ECB President, by an analysis on the challenges and future outlook of the EU. The report highlights the EU's progress in advancing circularity and decarbonisation, prioritizing them as priorities for the future competitiveness of the European economic model:

> "*EU is also the world leader in sustainability and environmental standards and progress towards the circular economy, backed by the most ambitious global targets for decarbonisation, and can benefit from the largest exclusive economic zone in the world*" (Draghi, 2024a).

The 'Competitiveness Compass for the EU', presented by the EC in January 2025 following considerations of Draghi's report, outlines a new roadmap for boosting EU productivity and global competitiveness based on three pillars (Draghi, 2024b). The potential of the circular economy is directly addressed under the second pillar on decarbonisation and the circular economy. However, the circular economy also aligns with the other two pillars: increasing competitiveness through innovations (e.g., circularity solutions) and supporting start-ups (first pillar), and securing the availability of critical raw materials (third pillar) (EC, 2025a), whereas

> "*The EU could potentially meet more than half to three quarters of its metal requirements for clean technologies in 2050 through local recycling*" (Draghi, 2024a).

As a part of the action plan presented in the Competitiveness Compass, the 'Clean Industrial Deal', aimed at securing the EU as an attractive location for manufacturing, including for energy intensive industries, and promoting clean tech and new circular business models, was published in February 2025. The Clean Industrial Deal prioritises circularity, reaffirming the ambition of the EU to become the global leader in the circular economy by 2030. Circularity and access to materials, alongside financing, are among the six business drivers identified by the Deal. The EU is expected to take further

steps to remove barriers to circularity, extending actions beyond waste management, such as eco-design, reuse, and remanufacture (EC, 2025c).

The implementation of the strategic framework presented in the Competitiveness Compass will require massive investments, estimated at EUR 750-800 billion per year by 2030 across energy, transport, digital, innovation and defence (EC, 2025a). To achieve this, both public and private finance need to be mobilised. Attracting private investment requires structural reforms, as Draghi's report highlights the EU's excessive reliance on bank financing and the underdevelopment of capital markets, which limits the flow of EU savings into productive investments. Regarding public finance, the objective shall be to optimise the use of available funds by focusing investments towards strategic priorities (Draghi, 2024b).

According to EEA:

> *"The investment needs for implementing all adopted circular economy policies and measures, as well as reaping wider circular economy investment opportunities in food, housing and mobility, are estimated at EUR_{2024} 170 billion per year, with a financing baseline of EUR_{2024} 141 billion per year, leaving an investment gap of around EUR_{2024} 29 billion per year until 2027 (an overall increase of 21% above the baseline). A more recent and more comprehensive assessment which extends to 2040 indicates a considerably higher investment need and considerably higher financing gap for the implementation of the circular economy in the EU, based on the sectors and actions included in the CEAP of 2020."* (EEA, 2025).

Ergo, as reaffirmed by the recent EU strategic framework, the EU aims to accelerate the transition to a circular economy, enabled by effective financial mobilisation. This raises the question of how to secure financing for circular economy development, particularly beyond waste and recycling. Building on previous work by the EEA, including research by the European Topic Centre on Circular Economy, this report explores the intersection of circular economy and finance. It assesses how financial sector actors consider the full range of circular economy strategies (Chapter 3). Such an assessment examines the role of the EU sustainable finance framework, the banking sector (given the dominance of bank financing in the EU), and capital markets (critical for funding innovation and attracting private savings, as highlighted in Draghi's reports). Based on this analysis, current estimates of circular economy investments will be critically reviewed (Chapter 4), followed by an identification of additional investment needs (Chapter 5). The report identifies challenges in estimating investment requirements for a circular economy and explores potential approaches and solutions. Ultimately, this research will contribute to enhancing the Circularity Metrics Lab.

The following key findings of the EEA assessment of circular economy financing will serve as guiding explorative statements for the research work for this report, to be supported or challenged (EEA, 2025) :

- The current investments focus very much on improved waste management and increased recycling.
- They cover the needs as stipulated by existing and already proposed legislation.
- Implementing higher levels of CE requires a much broader view eventually resulting in additional investment needs.
- Some of the CE investment needs can be embedded in/under other financing to meet other environmental goals.

Overall, the accelerated transformation towards a circular economy requires a better understanding of circular finance patterns that is achievable through better data availability and monitoring tools, and better, more tailored financing support schemes to scale up financing.

2 Methodology

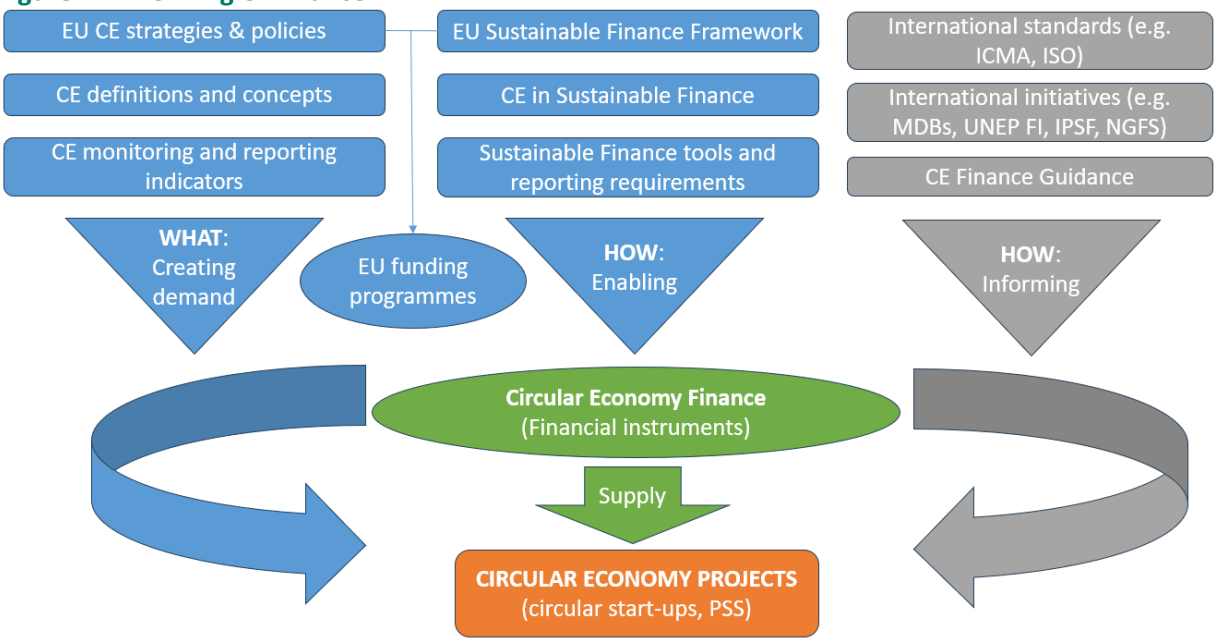
The following methodological approaches are undertaken for assessing the comprehensiveness of circular economy definitions and their applications by the finance sector as well as assessing financing possibilities and gaps.

Common for the whole report are the following: (i) the scope is limited to the European Union, with some short comments from other international practices whenever appropriate; (ii) the estimation of investments refer to constant prices (EUR_{2023}) if not indicated otherwise; (iii) in all topics of this report both ETC CE and ETC ST were involved; (iv) each of the chapters is concluded with a cross-cutting analysis resulting in key observations and recommendations.

For the critical review of the current EU circular economy concept across the different financing schemes, an integrative review (including text, exploratory, and diagnostic types of analysis) and expert interviews were chosen as methodological approaches. The materials for the integrative review included selected policy documents on circular economy and finance, relevant EEA and ETC publications, information on the role of banks in circular economy financing, publications of international financial institutions, as well as a selection of academic and grey literature. The research concluded with a visualisation on shaping the definition of circular economy finance. To test the findings of the research, five interviews were conducted with experts from the following institutions: European Investment Bank (EIB), UNEP FI, Swiss Environment Protection Agency (BAFU), Dutch National Bank (DNB) (see Annex 1). The interviewees are involved in circular economy activities; their views do not necessarily reflect the official positions of their institutions.

The assessment of the circular economy definition by the finance market was done in consideration of the influencing stakeholders and elements. The approach can be represented as follows:

Figure 2.1: Defining CE finance



Source: EAA elaboration

First, the EU conceptualisation of circular economy in the EU strategies and policies was reviewed and commonalities in circular economy activities descriptions confirmed. Then the EU Sustainable Finance Framework was assessed in respect of using the EU circular economy concepts in its tools and strategies as well as in respect of the data available for monitoring and reporting. Both circular economy indicators and corporate reporting play a crucial role in defining circular economy finance. The EU concepts formulate the language in the EU policies on EU funding programmes which are one of the important sources of sustainable finance. International initiatives' (like NGFS [1], IPSF [2]) contribution to circular economy finance developments was also considered. The research was accomplished with input from relevant studies and academic work. EU circular economy policies create **demand** for financing. On the **supply** side, to make circular economy finance available, EU sustainable finance policies respond with providing **enabling** tools and frameworks. International standards, initiatives, and circular economy guidance elaborate further to **inform** practical applications. These three streams influence adjustment of financial instruments, fostering innovative financing solutions like blended finance. Thus, the **circular economy finance**, suitable for circular economy projects, is defined.

The assessment of current CE investments was based on an integrative review (including text, exploratory, and diagnostic analysis) and country case studies including qualitative interviews with country experts. The integrative review covered academic, grey literature, and policy documents, EEA and ETC work, websites and publications by international financial institutions. The countries chosen for case studies were Germany, Austria, Luxembourg, and the Netherlands. The basis for choosing these countries for case studies was their leading positions in respect of the private investment to circular economy indicator, as well as availability of detailed information about countries, knowledge (also language knowledge) and involvement of the experts engaged in this research in the national CE strategies.

The identification of future and additional investment needs derived from the outcomes of previous research topics. The chapter synthesises empirical evidence and insights from academic and policy-oriented literature to understand the drivers of investment demand, the nature of financing barriers, and the role of financial innovation and institutional change. The analysis was supported with thematic case studies on circular start-ups and product-service systems to substantiate the need for specific CE instruments and to illustrate specific and tangible perspectives.

Finally, we discuss pathways to enrich the Circularity Metrics Lab with data on financing the circular economy.

An online workshop on circular economy finance was organised on 6 October 2025 to challenge and verify the findings and conclusions presented in this report. The following stakeholders participated in the workshop: Directorate-General for Environment (DG-ENV), European Investment Bank (EIB), Federal Office for the Environment (BAFU, Switzerland). The main observations from the workshop are included throughout the chapters.

To draw attention to conclusions, the respective paragraphs have grey shading. Insightful practices and case studies summaries are presented in boxes.

[1] Network of Central Banks and Supervisory for Greening the Financial System
[2] International Platform on Sustainable Finance

3 Current EU circular economy concept across different financing schemes

The analysis in this chapter assesses how the circular economy strategies or touchpoints, as considered in (EEA, 2024a), relate to the methodologies employed by the financial sector. This assessment follows a stepwise top-down approach: it begins with EU policies that define circular economy concepts and strategies, then examines how EU sustainable finance policies and instruments relate to these definitions and finally considers how they are reflected in the practices of the financial sector and capital markets.

3.1 Finance in EU policies related to the circular economy

3.1.1 Policy definitions of the circular economy

Based on a review of relevant policies and reports, the following clear and comprehensive definitions of the circular economy are used in this report to guide the exploration of how circular principles and financing instruments are mutually integrated.

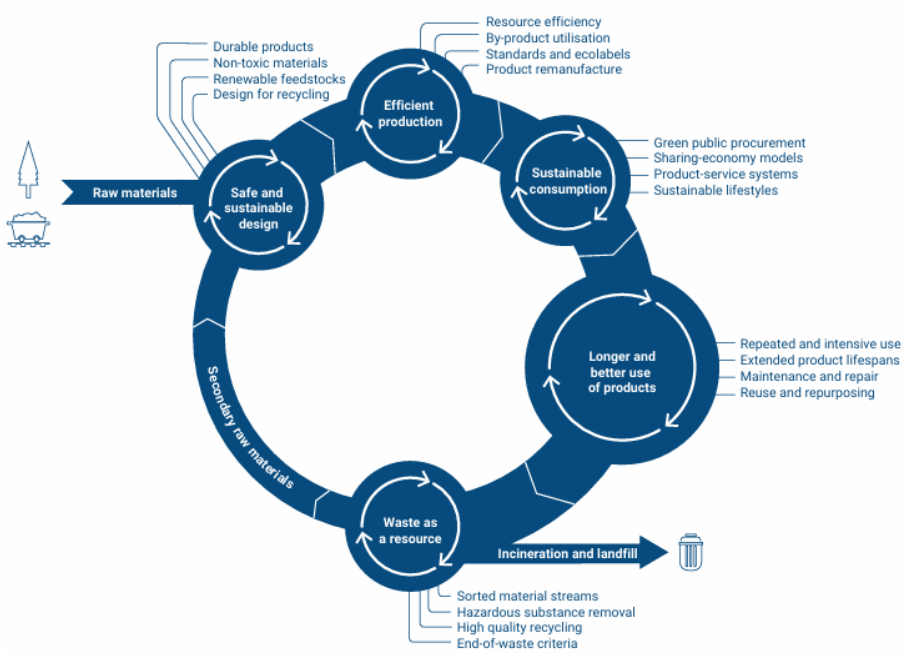
a) The European Parliament definition describes circular economy as "*a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the* ***life cycle of products is extended****. In practice, it implies* ***reducing waste*** *to a minimum. When a product reaches the end of its life, its materials are kept within the economy wherever possible thanks to recycling. These can be productively used again and again, thereby* ***creating further value.***" (European Parliament, 2023).

Figure 3.1: The circular economy model by EU Parliament

Source: Reproduced from EU Parliament information (European Parliament, 2023).

b) The EEA defines five touchpoints for achieving a circular economy in Europe, including activities and factors associated with each touchpoint (EEA, 2024a):

Figure 3.2: EEA touchpoints for achieving a circular economy in Europe



Source: Reproduced from EEA report (EEA, 2024a).

The same EEA report also adapted and classified the 9 R strategies from Potting et al. (2017) into before-use, during-use, and after-use actions to increase circularity along the product chain (EEA, 2024a).

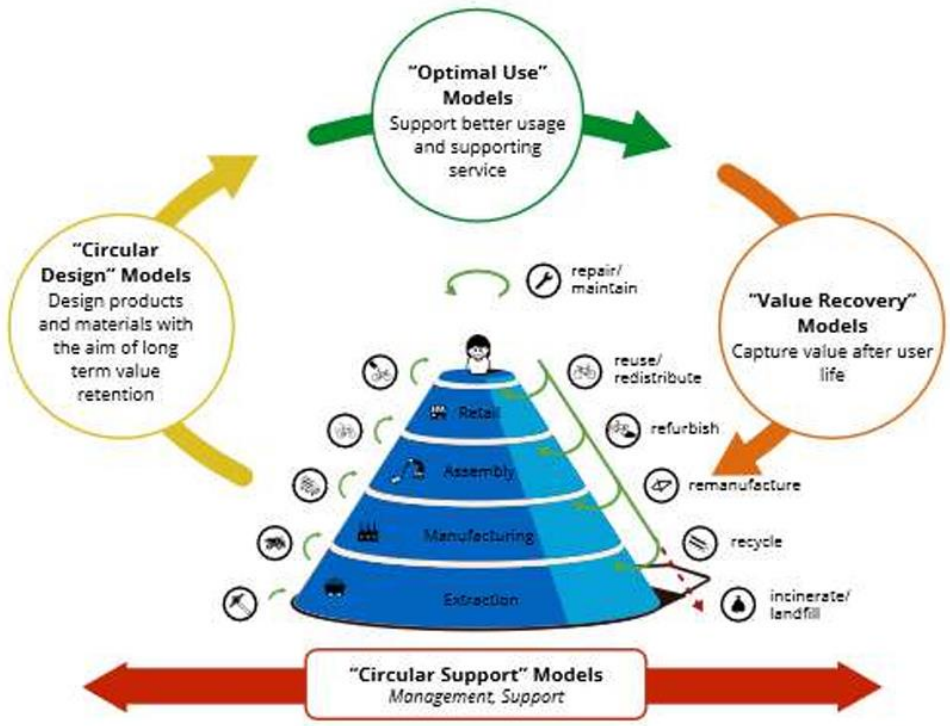
Figure 3.3 Actions for increased circularity within the product chain

BEFORE USE	REFUSE	Consider the necessity to acquire an additional product
	RETHINK	Design for longer lifetimes, repair and recycling or provide the function without making an additional product
	REDUCE	Produce the product with minimal environmental impact
DURING USE	RETAIN	Use and maintain existing products for a long service life
	REUSE AND SHARE	Provide products to others for further usage
	REPAIR	Fix defective products and return them to original functionality
	REMANUFACTURE	Rebuild products to deliver as-new, or upgraded, functionality
AFTER USE	RECYCLE	Process discarded products into useful, high-quality materials
	RETURN	Substitute virgin resources with secondary raw materials

Source: Reproduced from EEA report (EEA, 2024a).

c) The Independent Expert Report for the European Commission suggests a categorisation of circular business models, including 'circular design' models, 'optimal use' models, and 'value recovery' models. This categorisation system relies on the work on CE Finance Expert Group and is used by some international finance institutions (EC, 2020b).

Figure 3.4: Business Model Categories mapped on the Value Hill



Source: Reproduced from EU categorisation system of circular business models (EC, 2020b)

d) The 2020 EU Circular Economy Action Plan (CEAP) provides a comprehensive overview of different elements of circularity, grouping them under CEAP headings. It starts with "A sustainable product policy framework" heading, under which the following circular economy initiatives are covered (EC, 2020a):

- Designing sustainable products;
- Empowering consumers and public buyers;
- Circularity in production processes.

Next, the CEAP identifies the following "Key Product Value Chains" with the highest environmental impact and circularity potential (EC, 2020a):

- Electronics and ICT;
- Batteries and vehicles;
- Packaging;
- Plastics;
- Textiles;
- Construction and buildings;
- Food, water and nutrients.

The following heading refers to “Less waste, more value” describing support of waste prevention and accelerating circularity through enhanced waste policy, providing some considerations in respect of the EU market for secondary raw materials and in respect of waste exports (EC, 2020a).

Further headings provide more understanding on how to approach circular economy activities and Key Product Value Chain sectors, defined above, covering horizontal issues like:

- “Making circularity work for people, regions and cities”: circular economy transition is to be supported through the Skills Agenda, the forthcoming Action Plan for Social Economy, and the Pact for Skills. In terms of financing the transition is to be supported through the European Social Fund Plus, Cohesion policy funds, the Just Transition Mechanism and urban initiatives.
- “Cross-cutting actions”: emphasises the role of circular economy as a driver for climate neutrality, suggests how to get economics right, and highlights the role of R&D, innovation and digitalisation. This also includes reflecting circular economy objectives in the revision of the guidelines on state aid in the field of environment and energy as well as mainstreaming circular economy objectives in the context of the rules on non-financial reporting, and initiatives on sustainable corporate governance and on environmental accounting.
- “Leading efforts at global level”: considers international partnerships, global alliances and agreements.
- “Monitoring progress”: refers to the EU Monitoring Framework for Circular Economy and circular economy indicators.

Circular economy definitions and strategies based on them take into account both production processes or circularity actions and products and sectors with the highest potential for climate change mitigation through circularity. The Key Product Value Chains defined in the CEAP provide a comprehensive overview and include the sectors which are relevant for a circular economy, according to studies preceding the CEAP adoption. Most commonly mentioned sectors in different sources are plastics, packaging, textiles, construction (or built environment), food, agriculture. These sectors are also listed as popular priorities within national circular economy policies in the EU (EEA, 2024a). Thus, there is an alignment in respect of sectors with a high impact potential in case of circular transformation.

The circular economy terminology used at the EU level in relation to production processes and strategies ((a)–(d) above) is aligned in terms of the underlying considerations, which can be summarised as follows:

Table 3.1: Overview of EU circular economy definitions

Product chain	EEA circular economy touchpoints	9 R's (EEA, 2023, based on Potting)	European Parliament CE model	EU Categorization system for CE: cluster categories	CEAP Headings
Before use	Safe & sustainable design Efficient production	Refuse Rethink Reduce	Raw materials Sustainable design Production	Circular design & production	**A sustainable product policy framework** *Designing sustainable products *Circularity in production processes
During use	Sustainable consumption Longer and better use of products	Retain Reuse & share Repair Remanufacture	Distribution Consumption, reuse, repair	Circular use	*Empowering consumers and public buyers
After use	Waste as a resource	Recycle Return	Collection Residual waste; waste management	Circular value recovery	**Less waste, More value**
				Circular support (cross-cutting)	**Crosscutting actions** **Key Product Value Chains**

Source: EAA research based on policies reviewed.

The key differences between the EU circular economy definitions are (1) the inclusion of a cross-cutting category of circular support and (2) the definition of Key Product Value Chains (as covered above). The cross-cutting category covers for example ICT tools for predictive maintenance and repair, digital tools and applications to reverse logistics, virtual marketplaces for secondary raw materials, methodological frameworks, advisory services. Such products, services, or activities are not necessarily a missing category in other frameworks, rather it might fall under other categories. To succeed in circular transitioning the actions and strategies defined in different frameworks shall in first instance be applied in the Key Product Value Chains.

3.1.2 Finance as a topic within circular economy policies

A screening of EU policies related to the circular economy, conducted to identify links with finance, revealed that earlier policy documents made little or no reference to financing. Furthermore, older policies mainly relate to waste and recycling (e.g., packaging and packaging waste, waste, batteries and waste batteries, and the impact of certain plastic products on the environment). Initial financing measures in older policies (in 2008-2020) relate to waste and recycling and provide for extended producer responsibilities (EU, 2018, 2019) and polluter pays principle (e.g. EU, 2019). The Extended Producer Responsibilities (EPR) schemes represent producers' financial contributions aimed at covering '*costs of labelling waste receptacles for the collection of packaging waste'* and '*costs of carrying out compositional surveys of collected mixed municipal waste*' (EU, 2018). The Polluter Pays Principle (PPP) represents cost allocation, meaning that "*the polluter should be charged with the cost of pollution prevention and control measures*" (OECD, 2008).

More recent policies recognise the importance of financing, including the importance of mobilising private finance, and emphasising the enabling role of financing:

"Accelerating the green transition requires careful yet decisive measures to steer financing towards more sustainable production and consumption patterns" (EC, 2020a)

The CEAP refers to **the EU Sustainable Finance Framework**, pointing out that the circular economy objective is already integrated under the EU Taxonomy Regulation and preparatory work is carried out on EU Ecolabel criteria for financial products. The EU Sustainable Finance Framework is reviewed later in this chapter with a focus on its relevance to the circular economy, examining how it can guide the finance sector in supporting circular transitions. The CEAP recognises that the transition to circularity shall be driven through R&D, innovation, and digitalisation; thus, respective EU funding programmes of the **Multiannual Financial Framework (MFF)** are referred to (such as LIFE, Horizon Europe, or the Recovery and Resilience Plan 2022-2026). The CEAP mentions also that the European Social Fund Plus, Cohesion policy funds, the Just Transition Mechanism as well as the state aid will support the transitioning to circular economy. We will discuss these initiatives in the next chapter of this report.

Financing should be designed to incorporate mechanisms that prioritise and direct financing to the most impactful circular economy strategies. According to the European Court of Auditors, notwithstanding that "*a product's design determines around 80% of its environmental impact*", a significant part of the EU funding is spent for waste management and recycling projects rather than of circular design. It is recommended to the European Commission to improve monitoring of transitioning to circularity and consider incentivizing measures for directing more EU funding to preventing waste through circular design (European Court of Auditors, 2023).

Also, a wider range of financing options is suggested in more recent legislation, such as:

"Measures of financial nature could, for example, take the form of repair vouchers, repair funds, supporting or creating local or regional online platforms for repair, organising or financing training programs to acquire special skills in repair, taxation measures." (EU, 2024b)

"*Easier access to finance shall be ensured for strategic projects for critical raw material production.*" (EC, 2025e).

"The Commission should assist competent authorities in developing an effective financial framework, including through the use of Union Funds where appropriate, to implement the requirements of this Directive in accordance with the waste hierarchy and to support innovation in technologies and waste management." (EU, 2018)

Financial support to SMEs – including fiscal incentives and access to finance – is also considered in the implementation of some circular economy policies (EC, 2024c, 2024a; EU, 2023c). A particular focus on SMEs is justified by their important role in driving innovation in the circular transition:

"It is likely to be within Europe's 23 million small and medium enterprises (SMEs) where much of the pioneering and ground-breaking circular business developments will happen. Responses to Eurobarometer surveys indicate that more SMEs are offering green products and services […] although the increase is gradual. These 'green' activities are defined as products and services with a predominant function of reducing environmental risk and minimising pollution and resources. While not all of these will be focused on the circular economy, it is nonetheless relevant in terms of a broader shift to more sustainable business models" (EEA, 2024a).

3.2 The circular economy in EU policies on sustainable finance

As a starting point for the analysis from a financial policy perspective, the elements of the EU Sustainable Finance Framework (EC, 2025i) shall be looked at in comparison with the overview of circular economy definitions.

The EU Sustainable Finance Framework features multiple interconnected instruments for channeling private investment into the transition towards a more sustainable EU economy. The main initiatives of the EU Sustainable Finance Framework are:

- Platform on Sustainable Finance (PSF);
- Contributions to the International Platform on Sustainable Finance (IPSF);
- Sustainable finance disclosures (CSRD, CSDDD, SFRD, EU labels for benchmarks (Ecolabel));
- Tools and standards (EU Taxonomy, European Green Bond Standard (EuGB), EU ESG Rating).

In the following, the focus will be on circular economy considerations in the main initiatives of the EU Sustainable Finance Framework: the PSF and IPSF work, sustainable finance disclosures, the EU Taxonomy, and the EuGB. EU ESG Rating is not addressed in this analysis, as it pertains specifically to the regulation of EGS rating providers and fall outside the scope of this research.

3.2.1 The Platform on Sustainable Finance

EU Platform on Sustainable Finance (PSF)

The Platform on Sustainable Finance (PSF) is the main advisory body of the European Commission on sustainable finance and has published, among others, the Financing a Clean and Competitive Transition Report on Monitoring Capital Flows to Sustainable Investments in March 2025 (PSF, 2025b). In this report it analyses current investment levels as compared to total investment needs to reach the environmental goals of the EU Green Deal. This report uses the EU Taxonomy as a foundation for the methodology applied. The report also contains estimates on circular economy financing (to be covered in chapter 4 hereto).

On the definition behind the financing flows towards the circular economy, the PSF acknowledges in the Annex to the report that "*A variety of definitions and scope of action can be found in the literature on climate adaptation, biodiversity and circular economy, leading to wide ranges of investment needs.*" It further cites McKinsey, Summa Equity, and DG ENV as sources for different definitions of CE (PSF, 2025b).

The International Platform on Sustainable Finance (IPSF)

While the Platform on Sustainable Finance (PSF) is the main advisory body of the European Commission on sustainable finance, the International Platform on Sustainable Finance (IPSF) is a forum for dialogue between policymakers, aimed at scaling up the mobilisation of private capital towards sustainable investments. The IPSF has 20 members along with the EU. In 2024, the IPSF focused on three policy areas (IPSF, 2024b):

- the comparison of taxonomies;
- transition finance;
- biodiversity.

The IPSF does not directly develop EU Sustainable Finance tools, standards, or regulations but rather contributes through comparative analysis. Its work on comparing taxonomies builds up on the EU taxonomy (see the following section) and compares it to the China taxonomy. This comparative analysis covers the environmental objectives of the EU taxonomy – including the circular economy – and results in the EU-China bilateral Common Ground Taxonomy (CGT).

The bilateral EU-China CGT comprises in total 96 activities, of which nine relate to the circular economy. These nine activities are categorised into two International Standard Industrial Classification (ISIC) sections and four ISIC divisions (IPSF, 2024a).

Table 3.2: IPSF circular economy categories based on ISIC

ISIC Section	ISIC Division	CGT category	EEA circular economy touchpoints				
			Safe and sustainable design	Efficient production	Sustainable consumption	Longer and better use of products	Waste as a resource
E - Water supply, sewerage, waste management and remediation activities	37 - Sewerage	E5.1 Phosphorus recovery from waste water					
		E5.2 Production of alternative water resources for purposes other than human consumption					
	38 - Waste collection, treatment and disposal activities; materials recovery	E5.3 Collection and transport of non-hazardous and hazardous waste					
		E5.4 Treatment of hazardous waste					
		E5.5 Recovery of bio-waste by anaerobic digestion or composting					
		E5.6 Depollution and dismantling of end-of-life products					
		E5.7 Sorting and material recovery of non-hazardous waste					
F - Construction	41 - Construction of buildings	F5.1 Construction of new buildings					
	43 - Specialised construction activities	F5.2 Renovation of existing buildings					

Source: EAA compilation based on IPSF information.

Of the nine circular economy-related activities in the CGT:

- Six activities focus only on the 'waste as a resource' touchpoint ("after use" phase) of a circular economy.
- Three activities have relevance to other EEA circular economy touchpoints, also including 'waste as a resource'. 'Sustainable consumption' is the circular economy touchpoint which has the least relevance to taxonomies.
- All nine activities are also featured in the EU Taxonomy for circular economy, which in turn features additional categories (see Section 3.2.3.) that would also add value in the context of the CGT and international taxonomies per se.

Thus, both the PSF and the IPSF recognise the importance of taxonomies for sustainable finance. Alignment of taxonomies is achieved through the application of the recognised industrial classification.

3.2.2 Sustainable finance disclosures related to the circular economy

In this section, we discuss three specific initiatives involving sustainable finance disclosures:

- **The Corporate Sustainability Reporting Directive (CSRD)**: adopted in 2022 aiming for transparency and data on sustainability performance of companies. It requires companies to perform a double materiality assessment for reporting on impacts, risks, opportunities and action plans associated with their material ESG issues. Key focus is on **transparent disclosure**. This reporting requirement is for **companies**. (EC, 2025d). CSRD has replaced the Non-Financial Reporting Directive (NFRD) adopted in 2014. CSRD enhanced the reporting requirements and extended the scope.

- **The Corporate Sustainability Due Diligence Directive (CSDDD)**: adopted in 2024 with the aim of fostering "*sustainable and responsible corporate behaviours in companies' operations and across their global value chains*" (EC, 2024b). Key focus is on **value chains, on environmental impact** and **human rights**. This reporting requirement is for **companies**.
- **The Sustainable Finance Disclosure Regulation (SFDR)**: adopted in 2019 aiming to detail the obligations for financial market participants in respect of disclosing sustainability information, so that investors are informed on companies and projects supporting sustainability objectives. Key focus is on **sustainability impact of financial products**. This reporting requirement is for **financial market participants**, such as banks and asset management companies (EC, 2025h).

According to the European Commission's Omnibus package (EC, 2025g), the CSRD and the CSDDD are currently under evaluation and revision. The timeline of this report will not allow the inclusion of newer European legislative proposals. However, neither the definition of circular economy nor its connectivity with other environmental and social goals (and risks) will be affected by reviewing the directive and the delegated act.

Corporate Sustainability Reporting Directive (CSRD):

Credible, standardised corporate sustainability disclosure is of great importance for financial market actors. To efficiently benchmark investments and channel capital into sustainable economic activities without falling prey to greenwashing or market distortions due to asymmetric information a system of transparent, audited sustainability reporting is a prerequisite. Investors rely on trustworthy data to base their investment decisions on. This data should be no more complex and comprehensive than necessary but also no less so. The CSRD and the EU taxonomy are tools with the goal of providing information and data in such a manner.

The Corporate Sustainability Reporting Directive (CSRD) applies to large undertakings, SMEs (excluding micro-undertakings) with transferable securities admitted to trading on an EU regulated market and parent undertakings of large groups.

The CSRD mentions the circular economy in only one of its 84 recitals, and solely in the context of energy use and energy efficiency. All the same, the recital advocates for a "*full mobilisation of all economic sectors*" (Recital 48 EU, 2022b). The main source on circular economy in the context of the CSRD is the delegated regulation on the European Sustainability Reporting Standards (ESRS), published in July 2023, which represents the implementing technical standards of the CSRD (EU, 2023a).

The ESRS includes a specific standard **CSRD ESRS E5 on resources use and circular economy**, which is stated to be built, among others, on the CEAP and the Waste Framework Directive. Interaction with other ESRS standards is stated in the regulation, emphasising that other environmental matters, covered under ESRS E1 (Climate change), ESRS E2 (Pollution), ESRS E3 (Water and marine resources), and ESRS E4 (Biodiversity and ecosystems), could be material to circular economy (page 153, EU, 2023a).

The CSRD ESRS E5 standard sets out disclosure requirements related to resource inflows and outflows as well as waste. It defines circular economy from a company perspective, as follows:

"***Circular economy*** *means an economic system in which the value of products, materials and other resources in the economy is maintained for as long as possible, enhancing their efficient use in production and consumption, thereby reducing the environmental impact of their use, minimising*

waste *and the release of hazardous substances at all stages of their life cycle, including through the application of the* ***waste*** *hierarchy. The goal is to maximise and maintain the value of the technical and biological resources, products and materials by creating a system that allows for* ***durability****, optimal use or* ***re-use, refurbishment, remanufacturing, recycling*** *and nutrient cycling*." (EU, 2023a)

Further it refers to specific circular economy strategies considered under EEA touchpoints such as design and consumption:

"*A circular economy is a system that tends towards sustainable use of resources in extraction, processing, production, consumption and management of waste",* including the *"application of circular design, leading to increased product durability and optimisation of use, and higher rates of: Reuse, Repair, Refurbishing, Remanufacture, Repurposing and Recycling*". (EU, 2023a)

The ESRS E5 is structured in terms of Disclosure Requirements (DR):

Table 3.3: CSRD ESRS E5 DRs

DR Name	Obligation for companies	Information
E5 IRO 1: Impact, risks, and opportunities	To describe how risks and opportunities related to resource use and waste are identified and assessed.	Qualitative
E5-1: Policies on resource use and circular economy	To explain their policies on managing resource use (reducing use of virgin materials, increasing percentage of recycled materials, re-use, circular design).	Qualitative
E5-2: Actions and resources	To describe key actions taken and planned for achieving their policies' objectives and targets.	Qualitative
E5-3: Targets on resource use and circular economy	To inform about clear and measurable targets (including those required by law) set for achieving their circular economy strategies (e.g. increase of the use of recycled material, waste reduction, improvement of product design).	Quantitative
E5-4: Resource inflows	To report the total weight of materials they use, including how much are recycled or come from renewable sources, percentage of biological materials used, or by-products and waste used.	Quantitative
E5-5: Resource outflows	To explain how the materials are handled after their production process, including waste and finished products. Reporting on total amount of waste generated and how much is recycled.	Qualitative & quantitative
E5-6: Financial effects	To disclose the anticipated financial effects of their resource use strategies (e.g. cost savings).	Qualitative & quantitative

Source: EAA research based on (EU, 2023a).

The ESRS E5 provides a detailed description of the DRs, some examples of which are represented below.

The DR E5-1 requires companies to report how their policies address "*the prioritisation of the avoidance or minimisation waste (Re-use, Repair, Refurbish, Remanufacture and Repurpose) over waste treatment (Recycling). The concepts of eco-design, waste as a resource or post- consumer waste (at the end of a consumer -product lifecycle), should also be taken into consideration"*. (EU, 2023a)

The DR E5-2 requires companies to report on "*application of circular business practices such as (i) value retention actions (maintenance, repair, refurbishing, remanufacturing, component harvesting, upgrading and reverse logistics, closed loop systems, second-hand retailing), (ii) value maximisation actions (product-service systems, collaborative and sharing economy business models), (iii) end-of-life actions (recycling, upcycling, extended producer responsibility), and (iv) systems efficiency actions (industrial symbiosis*)". (EU, 2023a)

The DR E5-5 requires companies to provide "*description of the key products and materials that come out of the undertaking's production process and that are designed along circular principles, including durability, reusability, repairability, disassembly, remanufacturing, refurbishment, recycling, recirculation by the biological cycle, or optimisation of the use of the product or material through other circular business models*". (EU, 2023a)

The application requirements in ESRS E5 also provide a comprehensive description of what falls under circular economy, which is repetitive to the language used in the DRs.

In general, comprehensive descriptions used in the CSRD ESRS E5 relate to all of EEA circular economy touchpoints: 'safe and sustainable design', 'efficient production', 'sustainable consumption', 'longer and better use of products', and 'waste as a resource'. The ESRS E5 also refers to nine "R" strategies of circular economy: refuse, rethink, reduce, re-use, repair, refurbish, remanufacture, repurpose and recycle.

When in full effect, the CSRD will cover a few thousands of companies across the EU, which will - subject to their materiality assessments - also report on the circular economy indicators from ESRS E5. This data is supposed to be collected in a publicly available European Single Access Point (ESAP) according to the Regulation (EU) 2023/2859 of the European Parliament and of the Council of 13 December 2023 establishing a European single access point providing centralised access to publicly available information of relevance to financial services, capital markets and sustainability (EU, 2023e). It will give financial market participants the possibility to access standardised sustainability information (both quantitative and qualitative) on major European and international companies for benchmarking and making informed investment decisions.

The European Financial Reporting Advisory Group (EFRAG) has released a report on implementation of ESRS by European companies that had to publish their sustainability statements according to the CSRD (generative AI analysis). Based on 656 reports issued in April 2025, the EFRAG lists the following observations related to the circular economy topic:

- 65% of the reporting companies deem E5 'Circular economy' standard material (one of the six topical standards considered as material by at least 60% of companies);
- Among the six material topics rarely reported (less than 5% of reports) the 'Microplastics' (E2) topic is relevant for circular economy;
- Industrial categorisation based on NACE codes and Global Industry Classification Standard (GICS) used for financial institutions results in the following:

Table 3.4: Industrial categorisation

Industry classifications	#	%
Non-Financial and insurance activities	544	83%
Manufacturing	250	38%
Information & Communication	67	10%
Wholesale and retail trade; Repair of motor	46	7%
Professional, scientific and technical activities	39	6%
Transportation and storage	31	5%
Electricity, gas, steam & air conditioning supply	32	5%
Construction	24	4%
Real estate activities	17	3%
Others	38	6%
Financial and insurance activities	112	17%
Bank	74	11%
Insurance	29	4%
Other Financial Services	9	1%
TOTAL	656	100%

Source: Reproduced from EFRAG (EFRAG, 2025).

- Over 50% of activities are directly or indirectly related to a circular economy.
- Materiality reporting of standards varies depending on industry. Thus, "*Circularity" is material for ~65% of non-FIs, but only ~30% of FIs"* (EFRAG, 2025). This might signal the

difference between finance sector and non-financial entities in respect of awareness and recognition of circular economy aspects, as well as lacking clarity on circular economy language among FIs.

Table 3.5: Share (%) of companies reporting each ESRS topical standard as material

	E1 Climate Change	E2 Pollution	E3 Water and marine resources	E4 Biodiversity	**E5 Circular economy**	S1 Own workforce	S2 Workers in the value chain	S3 Affected communities	S4 Consumers and end-users	G1 Business conduct	# Companies Analysed
Non-Financial	98%	41%	38%	46%	63%	98%	68%	40%	68%	93%	545
Manufacturing	100%	62%	50%	41%	85%	99%	76%	29%	61%	92%	250
Information and com...	94%	5%	5%	15%	53%	100%	55%	17%	74%	94%	66
Wholesale and retail	98%	43%	33%	37%	80%	96%	72%	26%	67%	96%	46
Professional, scientifi..	100%	22%	18%	35%	55%	100%	68%	25%	65%	100%	440
Transportation and St..	97%	58%	13%	42%	58%	97%	61%	39%	61%	90%	31
Electricity, gas, steam	100%	41%	41%	62%	72%	94%	78%	72%	75%	84%	32
Construction	100%	46%	46%	71%	88%	100%	83%	50%	46%	92%	24
Real estate activities	100%	18%	65%	53%	76%	100%	53%	53%	82%	94%	17
Administrative and su..	90%	*	*	*	30%	100%	80%	30%	80%	90%	10
Mining and quarrying	100%	70%	70%	80%	40%	100%	90%	80%	*	100%	10
Other Non-Financial	95%	*	42%	26%	58%	95%	32%	21%	68%	95%	199
Financial	96%	12%	13%	38%	31%	100%	36%	19%	71%	93%	111
Bank	100%	7%	9%	34%	16%	99%	23%	24%	92%	96%	74
Insurance	100%	17%	17%	41%	45%	100%	48%	14%	83%	97%	29
AM & other Fis	88%	**	**	*	**	100%	*	**	38%	88%	8
Total	98%	38%	33%	39%	65%	99%	63%	30%	68%	93%	656
Companies Analysed	646	252	217	256	**424**	647	415	199	445	613	

* Fewer than three companies reported (data insufficient for comparison)
** Zero companies reported (no data available)

Source: Reproduced from EFRAG (EFRAG, 2025).

In summary, it can be said that the reporting requirements of ESRS E5 are very broad and all encompassing, including a variety of circular economy aspects not limited to recycling and waste management strategies but covering the entire product value chain. As the ESRS E5 standard is sector-agnostic it does not cover any explicit information on sectors or key product value chains from the CEAP. This will not change in the reviewed ESRS expected in 2026.

Corporate Sustainability Due Diligence Directive (CSDDD)

The key difference from CSRD is CSDDD's core focus on human rights and value chains and CSDDD's focus on taking action to end adverse impacts rather than reporting like CSRD. Large EU and Non-EU companies are applicable to the CSDDD that does refer to the CEAP and considers due diligence obligations concerning different forms of (hazardous) waste and pollution but does not go into further detail concerning circular economy. CSDDD requires companies to identify, prevent, reduce, and end negative human rights and environmental impacts in their operations and value chains.

Sustainable Finance Disclosure Regulation (SFDR)

The SFDR regulates the obligation for sustainability-related disclosures in the financial services sector. It applies to both company level and financial product (e.g., fund) level. It prescribes i.a. disclosure on sustainability risks, adverse sustainability impacts at entity levels (by considering principal adverse impacts (PAIs) on sustainability factors stemming from investment decisions), adverse sustainability impacts at financial product levels, and product specific disclosures for financial products that promote environmental or social characteristics (Article 8) or have sustainable investment as their objective (Article 9).

In the regulatory technical standards (RTS) supplementing the SFDR (EU, 2022a), the information to be published on entity level and product level is detailed. Regarding circular economy, the PAIs on

entity level require information on hazardous and radioactive waste ratios. Under the additional indicators, of which the reporting entity can choose one to report under the environment category, 'Water usage and recycling' or 'Non-recycled waste ratios' can be reported among others. Other additional indicators like 'Investments in companies without sustainable land/agriculture practices' can also potentially feature circular economy considerations.

Furthermore, the RTS specify that financial products falling under Article 8 or 9 of SFDR must report on their alignment with the environmental objectives of the EU Taxonomy (see Section 3.2.3) but not explicitly which environmental objectives are being pursued.

The disclosure of sustainable financial products does not necessarily allow for the identification or quantification of the share of investments directed specifically towards the circular economy.

EU labels for benchmarks, financial ecolabels

In Europe currently ten national or regional ecolabels exist that allow financial products to be certified as sustainable or green. These labels have been assessed with respect to linkages to circular economy. Two labels provide own definitions of circular economy activities falling within the scope of the label. Six out of ten include a rather indirect thematic reference, as they require funds to qualify as Article 8 or 9 products under the EU Sustainable Finance Disclosure Regulation (SFDR) to be eligible for ecolabel certification (the SFRD is reviewed above). This requirement establishes the link to the EU Taxonomy Regulation and thus the potential for certified funds to invest in companies that significantly contribute to the environmental objective "transition to a circular economy". Of these six financial ecolabels, some schemes also include direct references to circular economy-related activities funds can invest in such as real estate and waste. When linking the topic of circular economy with transition, the EU Taxonomy is a common regulatory reference. Only one ecolabel for financial products shows no link to circular economy, as it focuses on other sustainable thematic areas (see Table below).

Table 3.6: Financial ecolabels in the EU

	Label	Country	Main circular economy reference	Description and details
1	FNG Label (Version March 2026)	DACH	EU SFDR Article 2(17) or EU Taxonomy	* The fund has to investment sustainably pursuant to Article 2(17) of the EU Sustainable Finance Disclosure Regulation (SFDR) or the EU Taxonomy
2	FNG Transition Label (Version March 2026)	DACH	EU Taxonomy	* 'Transition' as defined by the environmental objectives of the EU Taxonomy, including the transition to a circular economy.
3	LuxFLAG Impact - Climate and Nature (Version March 2026)	Luxembourg	Own reference	* The non-exhaustive list of climate and nature themes and their sub-categories eligible for classification under the Impact Label - Climate and Nature include (the transition to) circular economy.
4	LuxFLAG ESG (Version July 2025)	Luxembourg	EU SFDR Articles 8 + 9 funds or own reporting	Option A – Applicant subject to EU SFDR: * The fund has to be classified as Article 8 or 9 product according to the EU Sustainable Finance Disclosure Regulation (SFDR) Option B – Applicant not subject to EU SFDR: The investment strategy promoting ESG characteristics, potentially including circular economy, is assessed on the applicant's legal and reporting documentation.
5	LuxFLAG Transition (Version September 2025)	Luxembourg	EU SFDR Articles 8 + 9 funds or own reporting; EU Taxonomy	Option A – Applicant subject to EU SFDR: Indirect circular economy reference: * The fund has to be classified as Article 8 or 9 product according to the EU SFDR Option B – Applicant not subject to EU SFDR:

				The investment strategy promoting ESG characteristics, potentially including circular economy, is assessed on the applicant's legal and reporting documentation. Transition objectives included in the investment strategy may refer to investments in economic activities linked to the EU Taxonomy, thus including circular economy.
6	Towards Sustainability (Version June 2023)	Belgium	EU SFDR Articles 8 + 9 funds (or analogous) & real estate	* The fund has to be classified as Article 8 or 9 product according to the EU Sustainable Finance Disclosure Regulation (SFDR) or analogous if the product is not in scope of the SFDR. Further circular economy reference: * Direct requirement for real estates: real estate investments shall be evaluated according to their contribution to ESG objectives and the avoidance of negative ESG impact including, amongst other aspects, material use, recycling, waste and circular economy.
7	Umweltzeichen(Version January 2924, adapted January 2026)	Austria	EU SFDR Articles 8 + 9 funds & circular economy	Indirect circular reference: * The fund has to be classified as Article 8 or 9 product according to the EU SFDR Further circular economy reference: * With regards to funds, various ESG topics must be examined for companies, including "*resource consumption, handling of finite raw materials, recycling, circular economy*"
8	Nordic Swan Ecolabel (Version February 2022)	Nordic countries	EU SFDR Articles 8 + 9 funds	* The fund has to be classified as Article 8 or 9 product according to the EU SFDR
9	Greenfin Label (Version January 2024)	France	Own reference	* Label focusses on activities in the field of energy, ecological transition and the fight against climate chang, including, inter alia, circular economy.
10	SRI Label (Version July 2020)	France		* No linkage to circular economy * Label focusses on social aspects

Source: EAA research.

Ecolabels for financial products are relevant to financial sector products (e.g. green bonds, sustainable savings products, current accounts, green loans) and investment products with a portfolio character. Financial ecolabels are supportive of direct investments into sustainable activities, including circular economy. The ecolabels do not refer to EU circular economy policies, but to the EU SFDR (which is analysed above) and the EU Taxonomy. The ecolabels do not specify sectors; however, some specific references are made to waste and recycling and to real estate. In respect of relevance to the EEA circular economy touchpoints, the most evident linkage is to 'waste as a resource'. This might explain the imbalance of investments into waste and recycling in comparison to other EEA circular economy touchpoints.

At the same time, it is questionable whether available data on ecolabels can meaningfully contribute to assessing the extent of circular economy financing.

3.2.3 EU Sustainable Finance tools and standards

Circular economy in the EU Taxonomy

The EU Taxonomy is a classification system developed by the European Union to define which economic activities can be considered environmentally sustainable. It provides criteria for assessing whether an activity significantly contributes to one of the six environmental objectives while doing no significant harm to others. The Taxonomy aims to guide investment decisions, increase transparency, and prevent greenwashing in financial markets. Under current law, companies which are subject to CSRD reporting requirements are also subject to the reporting obligation under the Taxonomy

regulation. The Disclosures Delegated Act which is technically setting out the taxonomy regulation sets out that real economy companies have to report taxonomy eligibility and alignment of their activities (revenue, CapEx, and OpEx). The most important key performance indicator (KPI) for companies in the financial sector is the Green Asset Ratio (GAR), calculated as a percentage of a financial institution's assets (loans, investments) aligned with the EU Taxonomy. For all other companies such a disclosure is voluntary. (EC, 2025f, 2025f; EU, 2021)

In 2021, a first Delegated Act was established to cover technical screening criteria for objectives on climate change mitigation and adaption. In 2023, the "Taxo 4" Delegated Act established criteria for the four other environmental objectives, including a transition to a circular economy. In the recitals – which are introductory statements providing the rationale behind the act – the circular economy is described to generate significant benefits towards the achievement of the other environmental goals of the Taxonomy. Those economic activities are in focus of the Taxonomy that show the biggest potential to contribute to a transition towards a circular economy, long-term value retention, waste reduction and the reduction of the Union's dependency on the import of raw materials from third countries (see the full list below) (EU, 2024a).

The recitals furthermore discuss circular economy from a product perspective, state that "good waste management is a building block of the circular economy", mention construction and demolition as one of the main economic sectors responsible for waste in the EU and talk about the role of product-as-a-service business models and digital solutions. Furthermore, the CEAP (EC, 2020a) is also mentioned in the recitals.

The following economic activities relevant to circular economy are currently included in the EU Taxonomy. Every of them contains specific quantitative and or qualitative criteria to comply with to prove a significant contribution towards a transition to a circular economy. The criteria are oftentimes very comprehensive and of a technical nature.

Table 3.7: EU Taxonomy economic activities and exemplary screening criteria for circular economy[3]

EU Taxonomy economic activity	Exemplary technical screening criteria
Manufacture of plastic packaging goods	• Until 2028, at least 35% of the packaging product by weight consists of recycled post-consumer material for non-contact sensitive packaging and at least 10% for contact sensitive packaging. From 2028, at least 65% of the packaging product by weight consists of recycled post-consumer material for non-contact sensitive packaging and at least 50% for contact sensitive packaging • The packaging product is recyclable in practice and at scale.
Manufacture of electrical and electronic equipment	• Where the economic activity manufactures electrical and electronic equipment complying with all EU Ecolabel criteria applicable to that specific product category, in accordance with Regulation (EC) 66/2010 of the European Parliament and of the Council [...]
Phosphorus recovery from wastewater	• For the process integrated at the waste water treatment plant, covering typically phosphorus salts such as struvite–magnesium ammonium phosphate ($NH_4MgPO_4 \cdot 6H_2O$), the phosphorus recovery process recovers at least 15% of the incoming phosphorus load. Only the harvested material, such as struvite, is counted for the calculation of this threshold.
Production of alternative water resources for purposes other than human consumption	• The reclaimed water is suitable for reuse. For use in agriculture, the reclaimed water complies with EU requirements, such as those set out in Regulation (EU) 2020/741 of the European Parliament and of the Council and national legislation. For uses other than agricultural irrigation, the final quality of reclaimed water is fit for purpose and compliant with existing national legislation and standards; Food, water and nutrients
Collection and transport of	• All separately collected and transported waste that is segregated at source is intended for preparation for reuse or recycling operations.

[3] The list of technical screening criteria only containing selected examples; see the Taxonomy Compass for the full list of criteria

non-hazardous and hazardous waste	• Source segregated waste consisting of (i) paper and cardboard, (ii) textiles, (iii) biowaste, (iv) wood, (v) glass, (vi) waste from electrical and electronic equipment (WEEE) or (vii) any type of hazardous waste is collected separately (i.e. in single fractions) and not commingled with other waste streams.
Treatment of hazardous waste	• The activities consist of the material recovery of secondary raw materials (including chemical substances and critical raw materials) from source segregated hazardous waste. • The recovered materials are substituting primary raw materials, including critical raw materials, or chemicals in production processes
Recovery of bio-waste by anaerobic digestion or composting	• The bio-waste that is used for anaerobic digestion or composting is source segregated and collected separately. Where bio-waste is collected in biodegradable bags, the bags have the appropriate compostable certification standard EN 13432:2000.
Depollution and dismantling of end-of-life products	• The economic activity dismantles and depollutes separately collected waste, in state-of-the-art facilities, from complex end-of-life products, such as automobiles, electrical and electronic equipment (EEE) or ships [...]
Sorting and material recovery of non-hazardous waste	• The activity attains or exceeds existing plant-specific material recovery rates by competent authorities set in applicable waste management plans, permits or contracts or by Extended Producer Responsibility (EPR) schemes. The facility implements internally defined Key Performance Indicators (KPIs) to track performance or attainment of applicable recovery rates.
Construction of new buildings	• Construction designs and techniques support circularity via the incorporation of concepts for design for adaptability and deconstruction [...] • The use of primary raw material in the construction of the building is minimised through the use of secondary raw materials [...]
Renovation of existing buildings	• At least 50% of the original building is retained. This is to be calculated based on the gross external floor area retained from the original building using the applicable national or regional measurement methodology, alternatively using the definition of 'IPMS 1' contained in the International Property Measurement Standards.
Demolition and wrecking of buildings and other structures	• The operator of the activity conducts a pre-demolition audit in line with the EU Construction and Demolition Waste Management Protocol. • The preparing for re-use or recycling of the non-hazardous construction and demolition waste generated on the construction site is at least 90% (by mass in kilogrammes), excluding backfilling
Maintenance of roads and motorways	• The re-used or recycled materials are not moved over distances greater than 2.5 times the distance between the construction site and the nearest production facility for equivalent primary raw materials, to avoid that the use of re-used or recycled materials leads to higher CO2 emissions than the use of primary raw materials. • Where newly installed, the binder course has a service lifetime no shorter than 20 years
Use of concrete in civil engineering	• The use of primary raw material is minimised through the use of secondary raw materials(138). For concrete, a maximum of 70% of the material comes from primary raw material. This criterion applies to in-situ poured concrete, pre-cast products, and all constituent materials, including any reinforcement. [...]
Provision of IT/OT data-driven solutions (*enabling activity*)	• IT/OT systems aimed at (i) monitoring for the replacement of consumables(150), such as printer ink, (ii) remote monitoring and remote maintenance of power generation plants that are more greenhouse gas intensive than 100 gCO2e/kWh, or (iii) monitoring and remote management of any type of fossil fuel engine do not qualify.
Repair, refurbishment and remanufacturing	• The economic activity consists of extending the lifetime of products by repairing, refurbishing or remanufacturing products that have already been used for their intended purpose by a customer (physical person or legal person). ross-cutting
Sale of spare parts	• The economic activity consists of the sale of spare parts beyond legal obligations. • [E]ach sold spare part is covered by a sales contract where relevant and in accordance with provisions as regards conformity of the product, liability of the seller(164) (including the option of a shorter liability or limitation period for second hand products), burden of proof, remedies for lack of conformity, the modalities for the exercise of those remedies, repair or replacement of the goods, and commercial guarantees;
Preparation for re-use of end-of-life products and product components	• The activity prepares for re-use products or components of products that have become waste so that they can be re-used without any other pre-processing. • The activity's waste feedstock originates from separately collected and transported waste in source segregated or comingled fractions.
Sale of second-hand goods	• The economic activity consists of selling a second-hand product that had been used for its intended purpose by a customer (physical person or legal person), potentially after its prior cleaning, repair, refurbishment or remanufacturing.
Product-as-a-service and other circular use- and result-	• The activity provides the customer (physical or legal persons) with access to, and use of product(s), while ensuring that the ownership remains with the company providing this service, such as a manufacturer, specialist or retailer. [...] • The activity leads to an extended lifespan or increased use intensity of the product in practice.

oriented service models		
Marketplace for the trade of second-hand goods for reuse (*enabling activity*)	•	The economic activity consists of developing and operating marketplaces or classifieds to support the sale or reuse of second-hand products, components or materials. The activity enables the trade (sale or exchange) for reuse of second-hand goods as specified in the activity description that have already been used for their intended purpose before by a consumer or an organisation, with or without repair.

Source: EAA elaboration based on Annex II of delegated act (EU, 2024a).

These economic activities overlap to a certain degree with the Key Product Value Chains in the CEAP and can also be clustered according to the circular economy touchpoints as proposed in the EEA Report 'Accelerating the circular economy in Europe' (EEA, 2024a).

Table 3.8: EU Taxonomy circular economy categories in relation to CEAP key product value chains and EEA circular economy touchpoints

EU Taxonomy economic activity	Related CEAP key product value chains	Related EEA circular economy touchpoints				
		Safe and sustainable	Efficient production	Sustainable consumption	Longer and better use of	Waste as a resource
Manufacture of plastic packaging goods	• Packaging • Plastics					
Manufacture of electrical and electronic equipment	• Electronics & ICT					
Phosphorus recovery from wastewater	• Food, water and nutrients					
Production of alternative water resources for purposes other than human consumption	• Food, water and nutrients					
Collection and transport of non-hazardous and hazardous waste	Cross-cutting					
Treatment of hazardous waste	Cross-cutting					
Recovery of bio-waste by anaerobic digestion or composting	Cross-cutting					
Depollution and dismantling of end-of-life products	Cross-cutting					
Sorting and material recovery of non-hazardous waste	Cross-cutting					
Construction of new buildings	• Construction and buildings					
Renovation of existing buildings	• Construction and buildings					
Demolition and wrecking of buildings and other structures	• Construction and buildings					
Maintenance of roads and motorways	• Construction and buildings					
Use of concrete in civil engineering	• Construction and buildings					
Provision of IT/OT data-driven solutions (*enabling activity*)	• Electronics & ICT					
Repair, refurbishment and remanufacturing	Cross-cutting					
Sale of spare parts	Cross-cutting					
Preparation for re-use of end-of-life products and product components	Cross-cutting					
Sale of second-hand goods	Cross-cutting					
Product-as-a-service and other circular use- and result-oriented service models	Cross-cutting					
Marketplace for the trade of second-hand goods for reuse (*enabling activity*)	Cross-cutting					

Source: EAA research based on Annex II of delegated act (EU, 2024a).

For each of the different economic activities, the EU Taxonomy provides multiple technical screening criteria (see Table 3.7 for examples) that sometimes relate to different EEA circular economy touchpoints. For example, the activity "Manufacture of plastic packaging goods contribution to circular economy" includes criteria on the use of circular feedstocks ("Waste as a resource"), design for reuse ("Longer and better use of products") and avoidance of hazardous substances in production ("Safe and sustainable design").

Hence, EU Taxonomy economic activities cover five out of seven key product value chains, leaving out textiles and batteries and vehicles, but at the same time suggests additional categories related to waste and circular economy services which are cross-cutting and might be relevant for some key product value chains. The EU Taxonomy categories relate to all five EEA circular economy touchpoints, with the most relevance to 'waste as a resource', followed by 'longer and better use of products', and the least relevance to 'sustainable consumption', 'safe and sustainable design' and 'efficient production'.

To support the application of the EU Taxonomy, an indicative mapping between the Taxonomy and NACE classifications was developed. However, this mapping is not part of any official document and should be used as guidance only. Ultimately, assessments based on the criteria set out in the Delegated Acts prevail over the NACE-based mapping.

The European Green Bond (EuGB) Standard

The EuGB Standard was published in November 2023. The Standard is voluntary and aimed at enhancing transparency, integrity, consistency and comparability of the green bond issues in the EU. The Standard provides for alignment with the EU Taxonomy criteria requiring that at least 85% of the bond proceeds are EU Taxonomy aligned (EU, 2023d; EC, 2023b, 2025j). The first green bond, the largest of its kind to date, aligned with the EuGB standard was issued by the EIB in April 2025. The EIB called it 'Climate Awareness Bond' and intends to use the proceeds for the amount of up to EUR 3 billion till 2037 for financing EU Taxonomy aligned activities primarily addressing the climate change mitigation objective (EEA, 2024c; EIB, 2025b).

Hence, circular economy considerations as outlined in this chapter are equally applicable to the EuGB Standard.

3.3 The role of multilateral development banks and sustainable finance initiatives

EU funding is allocated to the private sector (commercial financial institutions and companies) via multilateral development banks (MDBs). Therefore, approaches to sustainable financing are shaped by these MDBs, followed by development financial institutions (DFIs). MDBs and DFIs provide intermediary loans to commercial financial institutions, but also finance companies directly, co-finance with commercial financial institutions, and provide risk sharing (Ezeudu and Bristow, 2025). Besides financing MDBs are active in advisory and providing technical assistance for the introduction and implementation of strategies, policies, and reforms.

The MDBs and DFIs play a crucial role in financing circular economy projects whereas commercial banks lack risk appetite for innovative or less economically attractive environmental projects (Toxopeus et al., 2021). MDBs develop standard approaches for financing circular economy activities, incorporating environmental and social requirements along with green finance mechanisms (Ezeudu and Bristow, 2025). Additionally, the United Nations Environment Programme Finance Initiative (UNEP FI) engages a large network of banks, insurers, and investors to catalyse action across the financial system to deliver more sustainable global economies. The Network of Central Banks and Supervisors for Greening the Financial System (NGFS) shares best practices and contributes to mobilizing financing for supporting the transition toward a sustainable economy.

While the EU is heavily reliant on bank financing, the potential of private savings in the EU is high (higher than in the US) which can serve to support the implementation of environmental projects

through capital markets (Draghi, 2024a). Hence, in addition to examining how banks approach circular economy finance, it is also important to consider capital markets standards and regulations. Two sources are explored on purpose of this research: the International Capital Market Association (ICMA), as a promoter of the development of the international capital and securities markets through setting the rules and principles, and the European Securities and Markets Authority (ESMA).

3.3.1 MDB common methodological principles

At the World Circular Economy Forum 2024, the MDBs[4] have agreed on 'A Shared Vision for the Circular Economy', summarised by the Multilateral Development Banks' Circular Economy Working Group established a year earlier. According to MDBs' understanding,

"Circular solutions, including services, focus on preventing and minimising resource use and waste, notably by addressing obsolescence and promoting products with a circular design. They extend beyond waste management - in urban development, the bioeconomy, industrial processes and associated research and innovation." (MDBs, 2024b)

MDBs offer unique expertise in supporting the circular economy. Their role includes risk sharing in the financing of important projects and facilitating the adoption of circular approaches, such as policies and strategies that create an enabling framework for a circular economy. In addition, MDBs provide intermediary financing to commercial banks and offer technical assistance and advisory services to support innovative circular economy solutions. MDBs engage with diverse stakeholders at local, national, and regional levels, both in public and private sectors. These peculiarities make them an enabling actor in reforms and transformations.

MDBs recognise the challenges of circular economy financing:

"There is a prevalence of market failures and gaps hindering circular initiatives, such as ***unpriced externalities, lower likelihood of short-term investment returns, shifts in how value chains operate and are being financed, and there are inherent financing risks associated with pioneering innovation and technological change to grow the circular economy****. Sustainable economic models and markets must be fostered to unlock private investment. Targeted policy and fiscal reforms are needed to create a conducive regulatory and policy environment, which includes measures to enable fair competition between circular and linear products by considering environmental, climate, and social externalities."* (MDBs, 2024b)

MDBs have developed the Common Principles for Climate Mitigation Finance Tracking which provide a set of definitions and guidelines and a list of eligible activities for climate mitigation finance (hereinafter – the Common Principles). The Common Principles were adjusted in 2023 based on the MDBs' experience in their application between 2021 and 2023. The purpose of the Common Principles is to achieve consistent, credible, and transparent reporting of financial flows for climate mitigation finance. The list does not refer to the circular economy directly. The MDBs' approach is to assess the activities in the context of sectors or the categories. MDBs and DFIs (development financial institutions) commit to apply the Common Principles and encourage other finance institutions to adopt the methodology. The Common Principles are subject to further adjustments given the ongoing

[4] The African Development Bank (AfDB), the Asian Development Bank (ADB), the Asian Infrastructure Investment Bank (AIIB), the Council of Europe Development Bank (CEB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the Inter-American Development Bank Group (IDBG), the Islamic Development Bank (IsDB), the New Development Bank (NDB), and the World Bank Group (WBG).

developments in sustainable finance area, including taxonomies (MDBs, 2023a). There are no Common Principles specifically on the circular economy or other environmental topics.

The Common Principles provide detailed screening criteria and guidance for eligible activities in eleven categories (MDBs, 2023a). The relevance of the eleven categories to the five circular economy touchpoints is as follows:

Table 3.9: MDB IDFC Common Principles circular economy considerations

#	Category	EEA circular economy touchpoints' relevance	EEA circular economy touchpoints				
			Safe and sustainable	Efficient production	Sustainable consumption	Longer and better use of	Waste as a resource
1	Energy	No direct reference to circular economy. • However, lower carbon-energy generation and life extension of the equipment of generating energy are considered. Both relate to **efficient production** strategy of circular economy. • Use of waste gas as a feedstock or fuel to supply electricity, heat, mechanical energy and cooling energy is one of the eligible activities in this category. It relates to **waste as a resource**.		■			■
2	Mining and metal production for climate action	Direct reference to circular economy in respect of critical raw materials and recycling. • Relevance to **efficient production** (resource efficiency and by-product utilisation), **sustainable consumption** (eligible is only mining critical for clean energy transitions), **waste as a resource** (recycling).		■	■		■
3	Manufacturing	Eligible activities in this category relate to energy and resource efficiency as well as to support of low carbon development. • Mainly relevant to **efficient production:** more efficient equipment, resource-use efficiency, reduced use of virgin materials and decreased waste generation, lower carbon intensity, by-product utilisation. • Some relevance to **sustainable consumption** (secondary or alternative resources for substantial reduction in the resource use), **safe and sustainable design** (durability, design for recycling, non-toxic materials), **longer and better use of products** (extended product lifespans, reuse and repurposing), and **waste as a resource** (products could contribute to recycling). • This category is relevant to all five circular economy touchpoints.	■	■	■	■	■
4	Agriculture, forestry, land use and fisheries	Relevant to **'Food, water and nutrients' key product value chain** defined by the Circular Economy Action Plan. This category is relevant to all five circular economy touchpoints. • Relevance to **safe and sustainable design:** improved crop breeds and biotechnology that reduce emissions, improved feeding practices, improved quality of feed, improved animal husbandry, production of durable fibrous biomass products replacing plastics or other petroleum-based products, replacing energy intensive • Relevance to **efficient production**: using circular/integrated activities that enhance carbon stock, more efficient nitrogen fertiliser use, soil conservation, local feed production including use of agricultural residues, investments in reducing feed losses along the value chain, improved feed conversion efficiency, internationally accepted sustainability certifications, using circular/integrated activities that enhance carbon stock; more efficient fishing fleets, equipment and machinery; reduced food waste; avoided food losses along the value chain; production of bio-plastics from cereals by-products. • Relevance to **sustainable consumption**: plant-based proteins. • Relevance to **longer and better use of products**: rehabilitation of degraded land, improved pasture management • Relevance to **waste as a resource:** manure, water, and wastewater management; food waste utilisation; use of biomass residues for production of bioenergy.	■	■	■	■	■
5	Water supply and wastewater	• Relevant to **'Food, water and nutrients' key product value chain** defined by the Circular Economy Action Plan. • Relevance to **efficient production**: energy efficiency, reduction of non-revenue water, access to treated water, more efficient pumping, most energy efficient technologies for treatment, pumping or pipes; using gravity-based systems instead of pumping, efficient infrastructure considerations. • Relevance to **sustainable consumption**: employing rainwater, best available technology in water supply (smart pumps and variable frequency drives), demand management, water savings, an overall program to improve operation and maintenance across all metrics for the utility. • Relevance to **longer and better use of products**: wastewater reuse, repeated and intensive use. • Relevance to **waste as a resource**: wastewater collection and treatment.		■	■	■	■

6	Solid waste management	All activities listed in this category are directly related to circular economy. • Mostly the activities relate to **waste as a resource** (recycling, sorted materials streams) and to **longer and better use of products** (reuse, repeated and intensive use, repair, extended life of products, repurposing; modification).						
7	Transport	• Relevant to **'Batteries and vehicles' key product value chain** defined by the Circular Economy Action Plan. • No direct reference to circular economy. • However, potential eligible efficiency improvements include technical efficiency measures, such as i.a. improvements in design, propulsion, machinery, and operation. Also low-carbon vehicles and associated infrastructure can be a part of circular economy. Both areas of activities relate to **safe and sustainable** • Some eligible activities are relevant for **sustainable consumption.** (transport demand management and systems) and **waste as a resource** (use of waste gas as a transport fuel).							
8	Buildings, public installations and end-use energy efficiency	Relevant to **'Construction and buildings' key product value chain** defined by the Circular Economy Action Plan. • Relevance to **safe and sustainable design**: building design for lower energy consumption or GHG emissions; construction or building structures for high energy efficiency. • Relevance to **efficient production**: reducing energy and resource consumption, green building certification. • Relevance to **sustainable consumption:** digital or other smart solutions						
9	Information and communication technology (ICT) and digital technologies	Relevant to **'Electronics and ICT' key product value chain** defined by the Circular Economy Action Plan. • Relevance to **efficient production**: installing efficient information technology equipment, improving the efficiency of cooling systems, enhancing the data centre insulation, switching to cooling agents with lower global warming potential, adoption of emerging telecommunications technologies, resource-use efficiency measures. • Relevance to **sustainable consumption**: digitisation of service delivery or internal operations leading to a substantial reduction in travel or material use (application of e-government, telemedicine, mobile money, and teleworking).						
10	Research, development, and innovation	• As circular economy solutions are innovative, it relates to this category, although not mentioned specifically ("Support activities with the principal objective of mitigating climate change but that are not on the current eligibility list because they are new, innovative technologies or practices that are still far from commercialisation").						
11	Cross-sectoral activities	• Some activities listed in this category relate to circular economy: energy and resource-use efficiency measures including implementing circular economy systems, waste heat recovery (**efficient production**), demand reduction (**sustainable consumption**). • This category includes also enabling activities like policy support and technical assistance for energy and resource-use efficiency, policy support and technical assistance for low-carbon development.						

Source: EAA research based on MDB CPs (MDBs, 2023a).

Although there is no 'circular economy' category in the MDB IDFC Common Principles list, prior to analysing the screening criteria and guidance for eligible activities, some categories can be easily identified as directly connected to the circular economy: 'water and wastewater management' and 'solid waste management', which constitute a common part of circular economy. Note that MDBs have historically played a major role in financing full lifecycle waste management systems through a combination of public-private partnerships and results-based financing (Ezeudu and Bristow, 2025). Some categories refer to the sectors with high impact potential when transformed to circularity, i.e., the Key Product Value Chains defined by the CEAP - ICT; buildings; vehicles; food, water and nutrients.

The analysis of the eligible activities' relevance to the EEA circular economy touchpoints shows that most activities are relevant to 'efficient production' and 'waste as resource', while fewer are linked to 'sustainable consumption', 'longer and better use of products', and 'safe and sustainable design'. This distribution suggests that the Common Principles may help to explain why comparatively less financing flows to areas such as 'safe and sustainable design'. The criteria and guidance used by MDBs tend to reference circular economy principles more explicitly for touchpoints like 'waste as a resource' than for those related to upstream design and consumption practices.

In addition to the sectors of Key Product Value Chains defined in the Circular Economy Action Plan, circular economy activities can be spotted under categories relating to other sectors, such as energy; agriculture, forestry, land use and fisheries; water supply; and transport. Thus, financing directed to eligible activities in these categories will likely fall under the respective sectors. Manufacturing, as well as ICT and digital technologies, are cross-cutting categories relevant to multiple sectors.

In 2023 the MDBs have agreed upon the list of activities considered universally aligned or not aligned with the Paris Agreement's mitigation goals; that is, financing such activities will be automatically

considered sustainable. The list also does not refer to circular economy but follows the MDBs' approach of assessing the activities in the context of sectors or the categories given in the table above. An interesting observation is that the universally aligned activities in manufacturing explicitly exclude the high impact intermediary products (steel, cement, chemicals), identified by the Circular Economy Action Plan: "*Non-energy-intensive industry (excludes chemicals, iron and steel, cement, pulp and paper, and aluminium*)." (MDBs, 2023b)

Having applied the Common Principles, the MDBs produced a Joint Report on MDBs' climate finance in 2022 and 2023. The report covers both adaptation and mitigation finance provided by MDBs at a global scale, in low- and mid-income economies (USD 74.7 bn in 2023), as well as in high-income economies (USD 50.3 bn in 2023, 94% of which attributed to mitigation finance). The climate finance provided in the EU in low- and mid-income regions is negligent (below 1%). In contrast, 92% of the climate finance in high-income countries are attributed to the EU region. The report does not provide an insight on circular economy finance. For climate change mitigation finance the report shows the data in terms of the categories defined in the Common Principles analysed above. In 2023, 'solid waste' and 'water supply and wastewater' account to 1% and 5% of total climate finance respectively in low- and middle-income economies, and together around 2% in high-income economies (MDBs, 2024a).

By region and sector the MDB mitigation finance in high-income economies in 2023 looked as follows:

Table 3.10: MDB mitigation finance in high-income economies in 2023 (in USD millions)

	Central Asia	East Asia and the Pacific	Europe: European Union	Europe: Non-European Union	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa	Multi-regional	Total
Energy	-	-	13 001	65	893	16	-	-	434	14 408
Mining and metal production for climate action	-	-	29	-	-	-	-	-	-	29
Manufacturing	-	-	2 761	-	-	-	-	-	14	2 775

	Central Asia	East Asia and the Pacific	Europe: European Union	Europe: Non-European Union	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa	Multi-regional	Total
Agriculture, forestry, land use and fisheries	-	-	36	-	11	-	-	-	1	48
Water supply and wastewater	-	-	610	-	21	-	-	-	14	645
Solid waste management	-	-	206	-	28	-	-	-	3	236
Transport	-	70	13 550	-	151	274	-	-	53	14 097
Buildings, public installations and end-use energy efficiency	-	165	11 183	-	75	61	-	-	483	11 968
Information and communi-cations tech-nology (ICT) and digital technologies	-	-	-	-	4	-	-	-	7	11
Research, development and innovation	-	-	1 928	30	24	-	-	-	0	1 983
Cross-sectoral activities	-	-	592	-	405	8	-	-	48	1 053
Total	**-**	**235**	**43 896**	**95**	**1 612**	**359**	**-**	**-**	**1 056**	**47 253**

Source: Reproduced from MDB Joint Report 2023 (MDBs, 2024a).

The climate finance in the EU was allocated mainly to the transport sector (31%), followed by buildings, public installations and end-use energy efficiency (25%), and then by manufacturing (6%) and R&D and innovations (4%). Circular economy financing is likely to be included in those sectors.

MDBs have set up an informal working group for circular economy (MDB CE WG) in 2023, comprised of six members out of ten (EIB, EBRD, WBG, AfDB, ADB, IDBG). In the EU EIB, EBRD, and the WBG are active; hence, more analysis of their approach to circular economy will be presented in the following paragraphs. The key focus of the working group is experience sharing and business orientation. The commonly applied international concepts are Paris Agreement alignment and SDGs. For the EIB, however, the circular economy approach is based on the EU CEAP and EU Taxonomy (Source: Interview with EIB).

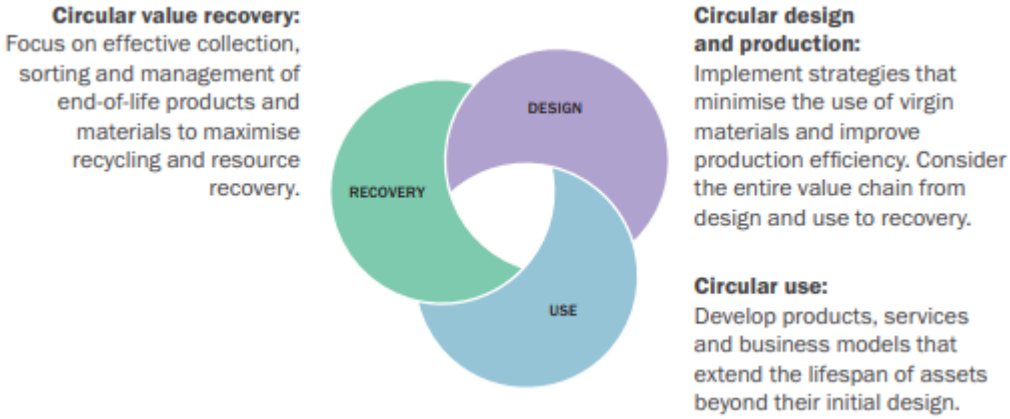
The MDBs CE WG has published a joint report in 2024 which emphasises the encompassing role of MDBs (MDBs, 2024c):

*"Through our advisory work, we **help public authorities put together coherent policies and regulations** that enable the circular economy to flourish. We support initiatives to **raise awareness of and help create markets** for circular products and business models. We develop **specific financing instruments to meet circular economy investment needs across the public and private sector** throughout the product life cycle, from design to value recovery. We **intervene to mitigate investment risks** for early-stage technologies or new business models."*

According to the MDB CE WG, for fostering of circular economy "*high-potential areas of investment include* ***cities and the built environment, plastics, critical and strategic raw materials, textiles and footwear, food, water and the bioeconomy, electronic waste (e-waste) and the automotive sector****. The multilateral development banks will continue to expand our support to these sectors while remaining attentive to emerging future opportunities.*" (MDBs, 2024c)

For providing financial support the MDBs consider circular economy projects in recovery, design, and use. These cover all of the five EEA touchpoints (except for clear reference to 'sustainable consumption', which can be included under 'use') (MDBs, 2024c):

Figure 3.5: Circular economy representation by the MDBs



Source: Reproduced from the MDB CE WG report (MDBs, 2024c).

The MDB CE WG report provides an overview of ten advisory and ten financing cases. Three advisory cases are for the EU, implemented by EBRD, EIB, and WBG. Five of the financing cases are completed in the EU, financed by the same MDBs: EIB, EBRD, and WBG. The advisory case studies refer to policy anchors: the regulatory requirements addressed by the cases. The advisory cases outside the EU refer mostly to the national or local action plans and strategies. The cases in the EU refer to different EU policies: the EU CEAP, the EU regulations on waste, on batteries, on construction products, on critical materials among others.

3.3.2 Initiatives by the MDBs active in the EU

In this section, we will discuss the approach of three selected international financial institutions: the **European Investment Bank (EIB)**, the **Work Bank Group (WBG)**, and the **European Bank for Reconstruction and Development (EBRD)**, which are also the members of MDB group developing the Common Principles and the MDB CE WG. According to the MDBs Joint Report on climate finance, as described above, climate finance volumes for high-income economies are relevant as it is mostly allocated to the EU. Among all MDBs, these three provide most of the climate finance in the region: EIB (84% of total climate finance for high-income countries in 2023), EBRD (5,7%), and WBG (4,8%) (MDBs, 2024a). In an interview with EIB, it was confirmed that only EIB, EBRD, and WBG are the active MDBs in the EU. Therefore, these three MDBs have been selected for analysis on how they approach circular economy finance.

European Investment Bank (EIB)

The EIB is the European Union's lending arm, financing projects that support EU policy objectives, including sustainability and innovation.

In 2019, as part of the Joint Initiative on Circular Economy (JICE), the EIB and five national promotional banks committed to mobilise 10 billion Euros in financing for circular economy projects within the EU by 2023, marking a significant early flagship pledge to scale up circular finance (Kumar et al., 2024). At the World Circular Economy Forum 2024, JICE partners announced they had surpassed this goal, achieving EUR 11.57 billion in financing for circular economy initiatives by the end of 2023. Upon Invest-NL has joined JICE, the commitment is stepped up to mobilise EUR 16 billion by the end of 2025 (The Joint Initiative on Circular Economy (JICE) steps up its commitment to provide €16 billion to circular projects by 2025 and welcomes Invest-NL as new member, 2024). From 2019 to 2023 the EIB co-financed, according to its own reporting, 132 circular economy projects with EUR 3.83 billion (EIB, 2024). While this still represents a modest share of overall EIB lending – total EIB Group results in 2024 amounted to EUR 88.8 bn (EIB, 2025c) – the volume of circular economy lending has increased steadily. For instance, the lending volume from 2018 to 2022 was 36 percent higher than during the period 2015 to 2019 (EIB, 2023b, 2024).

In its annual group report and the EIB Group Operational Plan (EIB, 2025d), the results are presented in terms of the core strategic priorities: climate; digitalisation and technological innovation; security and defence; a modern cohesion policy; social infrastructure; agriculture and bioeconomy; high-impact global investment; capital market union. Circular economy is assumed to be included under various strategies priorities. At the EIB, circular economy intersects with other sectors or environmental topics, for example, bioeconomy, innovations and competitiveness. The general tendency for financial markets as well as for the states is to approach circular economy as a cross-cutting or sector agnostic horizontal topic.

EIB strives to place sustainable finance at the centre of their activities. Therefore, they adopted a set of EIB Environmental and Social Standards that "*establish the requirements the promoter and the project must meet throughout the EIB project life cycle*". Resource efficiency and pollution prevention is one of these standards. The transition to circular economy is here an important part of it. The promoter of the project is required to protect and avoid significant harm to natural resources through preventive and mitigating measures over the lifetime of the project and life cycle of any products produced (EIB, 2022b, 2022a).

These measures are defined more detailed in the EIB Environmental and Social Policy (EIB, 2022c), where three areas in context of the circular economy are listed:

- New products and assets are designed and produced in a way that reduces virgin material consumption and waste generation (relating to EEA circular economy touchpoints 'safe and sustainable design' and 'efficient production');
- New business models and touchpoints are applied that optimise capacity utilisation and extend the useful life of products and assets (relating to EEA circular economy touchpoints 'sustainable consumption' and 'longer and better use of products'); and
- Resource and material loops are closed through recycling of end-of-life products and materials (relating to EEA circular economy touchpoint 'waste as a resource').

The EIB circular economy guide (EIB, 2023b), which refers to the EU categorisation system for circular economy, initially specified their approach of financing the transition to circular economy, as well as described the frameworks on which they base their understanding of circular economy. However, the EIB definition is mainly aligned with the definition of the European Commission and therefore with the EU Circular Economy Action Plan (CEAP) (EC, 2025b). The EIB circular economy guide (EIB, 2023b), which refers to the EU categorisation system for circular economy, initially specified their approach of financing the transition to circular economy, as well as described the frameworks on which they base their understanding of circular economy.

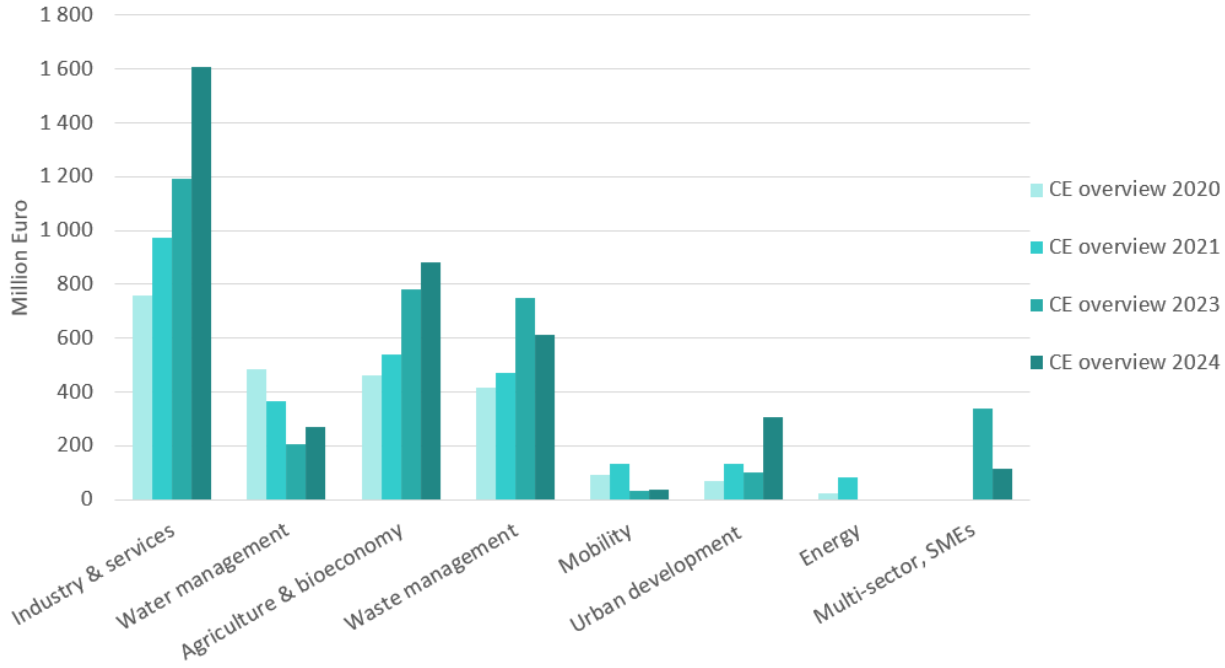
The EIB has aligned its methodology with the EU taxonomy on purpose of identifying projects and investments with the potential to make a substantial contribution to the circular economy objective of the EU taxonomy (Source: Interview with EIB). Certain activities are excluded from the EIB circular economy definition, including energy recovery from waste and residues, renewable energy production and use, and energy efficiency projects.

Within its frameworks and approaches, the EIB is supporting circular economy through:

- Financing products and instruments (like Investment loans, Framework loans, Intermediated lending, Venture debt). The products range from traditional loans to thematic focused investment programs as well as financial support of SMEs and fast-growing innovative companies with medium to high levels of risk.
- Advisory services and knowledge sharing. In this context public and private project promoters can benefit from a range of services. Supporting EIBs thematic focus on circular transition of cities they offer in this context advisory services and knowledge sharing through the Circular City Centre (C3) (The Circular City Centre - C3, 2025), a joint initiative together with the InvestEU Advisory Hub and European Commission´s Directorate-General for Research and Innovation. Under the same initiative a Circular City Funding Guide (EIB, 2025a) was developed. For specific circular economy indicators, this guide refers to several overviews and tools: the overview of circular economy indicators compiled by Urban Agenda Partnership for Circular Economy (EC, 2019), the framework of circular economy indicators developed by the World Business Counsil for Sustainable Development (WBCSD) (WBCSD, 2023), the work and tools by OECD and the Ellen MacArthur Foundation.
- Awareness-raising and partnerships (EIB, 2023b).

From 2014 to 2023 the EIB circular economy lending supported the following sectors:

Figure 3.6: EIB CE lending 2014-2023, per sector



Source: EAA/EEA compilation based on EIB CE overview publications for 2020, 2021, 2023, and 2024 (EIB, 2020, 2021, 2023a, 2024).

The analysis shows how the circular economy topic evolved over years. That is, circular economy lending to 'industry and services' sector is consistently growing. 'Water management' sector received less lending amounts over years comparatively to the first overview published in 2020. 'Agriculture and bioeconomy' sector is steadily growing likewise; however, the name in the last overview of 2024 changed to 'agri-forestry and bioeconomy'. 'Energy' sector was included in the circular economy lending overview of the EIB till 2018. As of 2018 'urban development' sector is complemented with 'buildings' and a new sector 'multi-sector, SMEs' is added while 'energy' removed. The approach to defining circular economy finance has been changing over time following the changed definitions in the policies on the EU level (e.g. development of EU Taxonomy delegated acts).

The change in the approach and definitions of sectors on one hand reflect adjustment of methodologies at the EIB, that can be triggered by policies (e.g. application of EU Taxonomy). On the other hand, it limits the consistency and proper analysis of circular economy lending development over years as the data used in the overview might differ over years.

In conclusion, the circular economy is a key element embedded within the EIBs sustainable finance framework for over ten years. However, the approach is still evolving, with ongoing integration of additional elements, such as the EU taxonomy, and the underlying methodology remains under development.

World Bank Group (WBG)

The World Bank Group is a global development institution that provides financial and technical assistance to developing countries to reduce poverty and promote sustainable growth. The World Bank Group (WBG) acknowledges the importance of circular economy. In its Climate Change Action Plan 2021-2025 (WBG, 2021) the WBG determines five key systems for supporting transformative

public and private investments: Energy; Agriculture, food, water and land; Cities, Transport, Manufacturing. In three of the five key systems, circular economy is an element:

- **Agriculture, food, water and land:** The promotion of the circular economy is mentioned here with regard to water. The following activities are included, reducing water losses; managing water demand; recovering and capturing valuable resources such as biogas, nutrients, and heavy metals from wastewater treatment; and adapting reuse of treated effluent and resource recovery.
- **Cities:** *"The WBG is helping countries and cities adopt integrated waste management and circular economy approaches to advance climate, development, and broader sustainability goals".*
- **Manufacturing:** *"The WBG will help manufacturing sectors to get on a path toward decarbonization via resource efficiency, […] , and circularity."* Redesign, reduce, reuse, and recycle products is mentioned as one aspect of circularity.

Looking into the key system "Cities" the support of WBG focused in the past on the waste management part. However, they apply a definition of waste management including all stages of the waste hierarchy and the circular economy, like designing for reusability, minimizing consumption, increasing reuse, repurposing end-of-life products, encouraging recycling, maximizing recovery, and practicing sanitary disposal. Between 2010 and 2020, the World Bank Group provided approximately USD 3 billion in loans to client countries for municipal solid waste management (MSWM), building on earlier investments exceeding USD 4.7 billion in over 340 solid waste management programs between 2000 and 2014 (Ezeudu and Bristow, 2025).

Although, the main activity of support here is basic municipal solid waste infrastructure and service delivery: *"Within infrastructure, the emphasis has been on closing uncontrolled dumpsites and building large sanitary landfills, with less consideration for transfer stations and waste collection and separation.*" The need of integrating waste hierarchy and circular economy principles is identified as an important action to enhance WBGs relevance and effectiveness when supporting countries with MSWM (WBG, 2022). The WBGs Climate Change Action Plan 2021-2025 identifies sustainable resource recovery as a strategic priority for the waste sector. This includes promoting solutions such as recycling, refuse-derived fuel, landfill gas capture and utilisation, and waste-to-energy, all of which can support the transition to a circular economy (WBG, 2021).

Furthermore, elements of circular economy are included in the WBG Sector Notes (WBG, 2025b), which provide sector-specific guidance for the WBG Paris Alignment Assessment Methods (PA). The WBG Sector Notes cover the following sectors: agriculture and food; digital development; water; energy and extractives; transport; urban, resilience, disaster risk management, and land; environment, natural resources and blue economy. The WBG Methods lay out criteria for project assessment regarding Paris aligned mitigation and adaptation dimensions (WBG, 2025a). *"WBG PA assessment methods are conceptually consistent with the joint MDB Paris Alignment Approach".* In Table 3.9 in section "MDB common methodological principles", the relevance of the activities to the EEAs circular economy touchpoints is analysed in detail. It is important to note that the WBG Sector Notes do not adopt the same sectoral classifications as the MDB Common Principles, although they cover similar activities. At the same time, the WBG – alongside the EIB and the EBRD (analysed below) – was among the creators and first users of the MDB Common Principles.

Together with other institutions, the International Finance Corporation, which is a part of the WBG, providing financing to private sector, has developed the Harmonised Circular Economy Finance Guidelines based on the EU Taxonomy.

Box 3.1: The Harmonised Circular Economy Finance Guidelines (the Guidelines)

Aimed at directing financial flows into circular economy, the Guidelines are "*sector agnostic and build on the existing guidance for circular economy finance, aligning in particular with the European Union's Categorisation System and ICMA's (International Capital Markets Association) Green Bond Principles*" (IFC, 2025). The Guidelines showcases examples from six sectors, which correspond (in full or partially) to almost all CEAP key product value chains (except for an example for 'plastics'). The Guidelines acknowledge the role of EU Taxonomy and the efforts of different stakeholders (e.g. UNEP FI, ISO, EBRD, ING, ABN AMRO) that laid a foundation for further standardisation.

The Guidelines specify circular economy categories which are inter alia sector-agnostic, may fall under multiple eligible categories, be partially or fully eligible. The three circular economy categories follow the logic of the EEA touchpoints: circular design and production (EEA's 'safe and sustainable design' and 'efficient production'), circular use (EEA's 'sustainable consumption' and 'longer and better use of products'), value recovery (EEA's 'waste as a resource'). Additionally, a cross-cutting category of circularity enablers is introduced as a circular economy category in the Guidelines.

The Guidelines suggest using both quantitative and qualitative indicators, pointing out that benchmarks and baselines require development and standardisation of practices. The Guidelines mentions the CSRD potential for assessing circular economy performance of borrowers by financial institutions. The Guidelines detail indicative project types and provide examples of reporting indicators per circular economy category.

The Guidelines highlights 37 case studies in six sectors, representing different circular economy categories and a variety of financial instruments used. The case studies suggest potential circular economy indicators (IFC, 2025).

European Bank for Reconstruction and Development (EBRD)

The EBRD supports the transition to open market-oriented economies in countries from Central Europe to Central Asia and the Southern and Eastern Mediterranean. In its Green Economy Transition Approach 2021-2025, the EBRD states that in the EBRD region "*circular business models are rare and regulatory systems supporting decarbonisation and circular economy are weak*" (EBRD, 2020). Work on the circular economy within the EBRDs transition approach falls under the thematic area of "industrial decarbonisation". Circular economy is herewith seen as an enabling factor under the umbrella of climate policies.

The EBRD's approach to circular economy financing includes eligibility criteria for projects or businesses that adopt technologies, processes and innovation transitioning the businesses towards circular economy in line with the EU categorisation system for the circular economy. Together with other FinanCE working group members – including the EIB, the Ellen Macarthur Foundation and some commercial banks – the EBRD developed and published the Circular Economy Finance Guidelines in 2018. These guidelines propose a definition of circular economy finance and guidelines to assess both the business model of companies and the circularity of their projects. The Guidelines also include a list of exclusions and conditions (ING et al., 2018). The Guidelines were created prior to the adoption of the CEAP and the publication of the EU Circular Economy Categorisation System in 2020, with the aim of supporting the finance sector in financing circular economy projects.

3.3.3 Initiatives in the finance sector

United Nations Environment Program Finance Initiative (UNEP FI)

UNEP FI engages the financial sector and supports capacity building to accelerate the transition to a circular economy, focusing on high impact sectors. Within the scope of its Principles for Responsible Banking (PRB) UNEP FI approaches circular economy finance through a dedicated working group and publishes resources and guidance. Circular economy is considered as an enabler for achievement of climate targets, committed to by financial institutions as members of the UN Principles of Responsible Banking, the largest global sustainable banking framework comprising more than 345 banks ((UNEP FI, 2025); UNEP FI interview).

The finance sector tracks economic developments and responds to evolving market demand. As a result, circular economy financing is an answer to the demand created at the market. Respective policies which foster the development of circular economy products and services, therefore, also foster the development of tailored circular economy finance. Scaling up takes place when new policies are developed or the existing policies are updated based on data produced by the finance sector, providing financing in response of existing policies. Key observations from an interview with UNEP FI are the following:

- There is a lack of harmonisation; however, the principles of the circular economy and the focus on high impact sectors serve as common denominators, which provide the basis for actions.
- There is a time mismatch between the short-term high-risk perception and the long-term derisking potential of circular economy investments. Hence, subsidising is necessary and there is a need to change current risk assessment models.
- The market pressure to support the transition to a circular economy remains insufficient to drive the financial sector to redirect capital flows towards circular economy projects. The circular economy is seen as an enabler, but not as a necessity for achieving climate goals. Therefore, regulatory pressure is needed.

Reports and guidance on circular economy published by UNEP FI are generally coherent with the circular economy concepts as used by the EU. UNEP FI directly references circular economy definitions from the EU Commission. For example, in its Circular Economy Target-Setting Guidance, UNEP FI references the European Commission's Categorisation System for the circular economy, adopting the same business model categories and activity stages: circular design and production, circular use, circular value recovery, and circular support (UNEP FI, 2023).

In its publication on circular economy as an enabler for responsible banking, UNEP FI lists eight key sectors for banks and circular economy, based on the ISC Rev.4 sections (UNEP FI, 2024a):

- Agriculture, logging and fishing;
- Mining and quarrying;
- Manufacturing;
- Electricity and gas supply;
- Construction;
- Transport;
- ICT activities;
- Waste management.

The key sectors listed by UNEP FI generally align with the EU CEAP key product value chains. However, UNEP FI's sectors are broader (e.g., the CEAP product value chains packaging, plastics and textiles fall

under UNEP FI's key sector 'manufacturing'; batteries and vehicles – under 'transport')[5]. UNEP FI suggests banks to consider circular economy activities additionally in mining and quarrying, electricity and gas supply, and waste management sectors.

In its circular economy target-setting guidance, UNEP FI differentiates between "key negative sectors" (agriculture and food systems, mining, manufacturing, plastics/packaging, textiles and fashion, construction, transport and vehicles, information & communication activities/electronics, and chemicals) and "key positive sectors" (waste management and water treatment). While those two sectors are not explicitly listed in the CEAP key product value chain, they are a relevant part of the CEAP. Also, MDBs in their Common Principles attribute these two sectors to universally aligned with Paris Agreement. The "key negative sectors" include all the CEAP key product value chains and additionally manufacturing and mining.

UNEP FI provides a list of circularity impact indicators in its circular economy target-setting guidance, which are adapted from ICMA's GBP Impact Reporting Working Group (see also Section 3.3.4)[6].

The Network of Central Banks and Supervisors for Greening the Financial System (NGFS):

The work of the NGFS focuses on two environmental topics: climate change and nature degradation. While the circular economy is acknowledged within these contexts, it is not studied in detail as a standalone topic. References to the circular economy of the NGFS include:

- Circular economy as part of NGFS definition of transition risk ("*Financial risks associated with the shift towards a low-carbon and more circular economy, driven by changes in environmental policy, technological advancements, or shifts in market sentiment*.") (NGFS, 2024b).
- Reference to ICMA handbook (2023) for impact metrics at the green bond level (from sovereign issuers), which also covers circular economy impact metrics (NGFS, 2024a).

European Central Bank (ECB) and other European central banks

The European central banks have multiple levers to support circular economy finance, primarily through the management of their own financial portfolios and monetary policy. Regarding the latter, the ECB states maintaining price stability is essential for the transition to a low-carbon and circular economy (ECB, 2024).

The NGFS also plays a significant role in shaping the ECB's and European national and central banks' approach to environmental challenges. As members of the NGFS, European national and central banks, as well as supervisory authorities, are oriented towards the NGFS recommendations on integrating sustainability into financial oversight. In line with the NGFS, the ECB acknowledges sustainability risks linked with transitioning towards a low-carbon and circular economy and reflects this in its supervisory expectations for environmental risk management (ECB, 2020). The central banks are focusing on managing risks. Circularity is rather a solution than a risk – which is why central banks are not initiating activities on circular economy financing. Their interest lies more in issues such as the

[5] UNEP FI's Sector Mapping tool can be used by banks to get a more granular list CE key sectors (UNEP FI, 2024b)

[6] The GBP Impact Reporting Working Group - Suggested Impact Reporting Metrics for Circular Economy and or Eco-Efficient Projects (ICMA, 2021b)

circular use of materials, the analysis of raw material scarcity, and the financial implications of resource constraints (Source: Interview with DNB).

For the definitions and concepts related to the circular economy, the ECB primarily refers to existing EU regulations, particularly the EU taxonomy and CSRD (both described above) (Maria J. Nieto and Chryssa Papathanassiou, 2025). European national and central banks such as the Banque de France (BdF) also follow this approach - see for example (Banque de France, 2024).

De Nederlandsche Bank (DNB), the Dutch central bank, set up a Sustainable Finance Platform in 2017, consisting of relevant government actors and industry alliances, aiming to promote sustainability in the Dutch financial sector. A Circular Economy Working Group has been established within this platform (interview with DNB, Platform voor Duurzame Financiering, 2022).

Box 3.2: DNB Circular Economy Working Group

The DNB facilitates the work of this group, which is led by Invest-NL, the public vehicle for impact investment in the NL (similar activities to the EIB but on a national level), supported by the Ministry of Infrastructure and Water Management, which takes care of the circularity topic. The Municipality of Amsterdam, the Dutch Banking Association and individual financial institutions are members (DNB interview).

As the first step, the working group published a **Roadmap for Circular Finance for 2030** for the financial sector, which addresses the integration of linear risks and circular opportunities in financial decision-making (Platform voor Duurzame Financiering, 2022). The initial focus was on highlighting case studies. According to the Roadmap for Circular Finance for 2030, the circular risk metrics are to be developed in line with EU Taxonomy, CSRD, and SFDR. Further on, the circular metrics are to be scaled up per sector, in order to become a standard part of credit and investment applications by 2030 (Platform voor Duurzame Financiering, 2022).

The working group developed the **Circular Risk Scorecard**, which uses the Circular Transition Indicators (CTI) framework of the World Business Council for Sustainable Development (WBCSD) to define circular economy and linked concepts (Kopgroep Circulair Financieren, 2024).

As a result, five types of circular businesses have been identified as relevant for the Circular Risk Scorecards:

- Resource recovery (material sales model) - relevant to ‘waste as a resource’
- Circular supplies (product sales model) - relevant to ‘efficient production’ and ‘sustainable consumption’
- Product life-time extension (service sales model) - relevant to ‘longer and better use of products’
- Product-as-a-Service - relevant to ‘sustainable consumption’
- Sharing Platforms - relevant to ‘sustainable consumption’
- The Circular Risk Scorecards have been tested on 100 business analysis, one of the findings of which was that circular business is less risky than linear (Circular Economy Working Group, 2024)

The Dutch Circular Economy Working Group established by the DNB does not directly refer to the circular economy definitions of the European Commission. At the same time, the circular businesses relevant for the Circular Risk Scorecards relate to the EEA circular economy touchpoints, as described above. The CTI framework by WBSCD is also a methodology referred to as useful for circular economy finance by other actors (Source: Interview with BAFU). The same approach of highlighting circular economy financing case studies was undertaken by MDBs (MDBs, 2024c).

Ellen MacArthur Foundation

The Ellen MacArthur Foundation is "*a non-profit organisation that creates evidence-based original research on the benefits of a circular economy, and how it can contribute to solving global challenges like climate change and biodiversity loss*"(EMF, 2025).

In the 2020 report "Financing the circular economy – Capturing the opportunity" they give an overview on the status quo of the circular economy transition and different financing strategies and products for the circular economy. In the appendix to the report, they analyse the circular economy growth potential for different industry sectors, highlighting that different definitions and strategies must be applied according to specific sectors (e.g., in plastics and packaging goods the focus should be on avoidance and recyclability, whereas in fashion and textiles re-use and repair as well as resale are in focus) (EMF, 2020).

In their 2021 white paper together with Bocconi University and Italian bank Intesa Sanpaolo they calculate the de-risking effects and superior risk-adjusted returns of companies with higher Circularity Scores (Bocconi University et al., 2021). Also, they present their concept of a circular economy, which is made up of the following three parts: "Eliminate waste and pollution", "Keep products and materials in use" and "Regenerate natural systems". Especially the explicit focus on the regeneration of natural systems falls a bit outside of the definition of circular economy in the CEAP, which is focusing more on products and the key value chains (although including food, water and nutrients) as well as the EEA touchpoints (see Section 3.1.1). Furthermore, the definition of the Ellen MacArthur foundation underscores the importance of digitalisation in the transition to a circular economy.

Summa Equity

Summa Equity is "*a thematic investment firm, considering the world's uncertainties as opportunities*" (Summa Equity, 2025), which has published a report on the investment opportunities related to a circular economy in Europe (Summa Equity, 2023). Within this report they provide what they call a "pragmatic definition of the circular economy for investors". This definition focusses on three main points:

- circular economy provides significant environmental and economic benefits and plays an important role in the strategic autonomy of Europe,
- shifting the focus from the product (steel in car making) as such to the service it provides (transportation) can open up new perspectives, and
- residual waste streams must be managed. Based on these thematic areas, business models and investment opportunities can be identified, for example "products as a service" business models, innovations for material efficiency, circular materials and the valorisation of residual waste.

All in all, this conceptual framework fits nicely within the definitions provided in the CEAP as well as depicted in the EEA touchpoints (see Section 3.1.1).

3.3.4 ICMA and ESMA work & publications

Improved functionality of capital markets is the prerequisite to improved competitiveness of Europe, decarbonised and circular economy, as mentioned in the Draghi report (Draghi, 2024b). Hence, the rules, principles, and recommendations developed by the International Capital Market Association

(ICMA), as well as the work of the European Securities and Markets Authority (ESMA), shall be reviewed in respect of their relevance to the circular economy.

International Capital Market Association (ICMA)

ICMA unites over 600 members active in international debt capital markets in 70 jurisdictions globally. To support the development of capital markets, ICMA has elaborated market practice and regulatory policies. ICMA has published four documents, providing principles and guidance to support the development of sustainable finance in the bond and wider debt capital markets, collectively known as "**the Principles**": the Green Bond Principles (GBP), the Social Bond Principles (SBP), the Sustainability Bond Guidelines (SBG), and the Sustainability-Linked Bond Principles (SLBP).

Having assessed over 150 green and sustainability bonds issued globally before 2022, Ernst & Young (EY) concluded that "*over 80% of sustainable bonds indirectly support circular practices, whereas only 5% are dedicated to circularity... Among the commonly seen use of proceeds (UoP) categories, Circular Economy, Pollution Reduction and Other have the most detailed eligibility criteria fully aligned to the CE, such as use of circular materials, landfill diversion and habitat restoration. Renewable Energy, Energy Efficiency and Transportation criteria mostly contribute to CE (e.g., via mass transit)* (Mark Weick and Nicole Ray, 2023). The study points out on some limitations of green bonds used for circular economy projects, among others, focus on circularity in human-made environments limiting "*the critical circular aspects of the biosphere, the natural systems providing resources and services such as purified water*" (Mark Weick and Nicole Ray, 2023).

The **Green Bond Principles (GBP)**, alignment with which requires utilisation of proceeds of the bond for eligible green project categories. Given that the Principles are referred to for issuance of 97% of green, social, or sustainable bonds in 2024 (ICMA, 2025d), they constitute an important contribution to sustainable finance assessment and potentially for circular economy finance assessment, depending on the available granularity of reporting. The Principles allow inclusion of eligible assets for refinancing with the proceeds; thus, respective reporting covers not necessarily only new investments.

Out of ten categories described in the GBP four relate to circular economy (ICMA, 2025a):

Table 3.11: GBP categories relating to circular economy

Green project categories	EEA circular economy touchpoints				
	Safe and sustainable design	Efficient production	Sustainable consumption	Longer and better use of products	Waste as a resource
Pollution prevention and control (including reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, waste recycling and energy/ emission-efficient waste to energy)		■			■
Sustainable water and wastewater management (including sustainable infrastructure for clean and/or drinking water, wastewater treatment, sustainable urban drainage systems and river training and other forms of flooding mitigation)					■
Circular economy adapted products, production technologies and processes (such as the design and introduction of reusable, recyclable and refurbished materials, components and products; circular tools and services); and/or certified eco-efficient products	■	■	■	■	
Green buildings that meet regional, national or internationally recognised standards or certifications for environmental performance		■			

Source: EAA compilation based on ICMA GBP (ICMA, 2025a).

Circular economy measures might be also included in other categories - energy, environmentally sustainable management of living natural resources and land use, and clean transportation – the categories which are considered in the CEAP or in the MDB Common Principles.

The **Social Bond Principles (SBP)** do not include language relevant to the circular economy (ICMA, 2025c). However, the Circular City Funding Guide, developed by the EIB and other experts, refers to social impact bonds importance for circular cities development. In the **Sustainability Bond Guidelines (SBG)** relevance to circular economy provided as in the GBP (ICMA, 2021a). The **Sustainability-Linked Bond Principles (SLBP)** refer to the KPI registry as sector guidance, which covers the following environment themes (almost all relevant directly or indirectly to circular economy): climate change (GHG emissions and energy), air quality, water, waste, raw materials sourcing and recycling (circular economy), biodiversity (including soil and land use). The KPI registry also provides a materiality matrix with sectors most relevant for the environment themes (ICMA, 2024).

To support directing investments into the circular economy green project category, ICMA suggests impact reporting metrics on circular economy and/or eco-efficient products, developed by a working group which included the World Bank and the EBRD in 2021 (ICMA, 2021b). An important challenge in these metrics is their reliance on qualitative information:
"For circular economy projects, qualitative information is especially important in order to highlight how a project, a component of a project and/or a business contributes substantially to the circular economy, thereby differentiating it from linear resource efficiency projects that optimise or reduce resource use, but without increasing value retention or value recovery" (ICMA, 2021b).

The impact reporting metrics refer to the EU categorisation system for the circular economy and five out of nine R's. The suggested indicators are clustered according to the EU categorisation system for the circular economy chart (see Section 3.1.1), which covers all EEA circular economy touchpoints and suggests the benchmarks for accountability of data. ICMA also suggests other sustainability indicators, some of which provide an insight of other environmental sectors in which circular economy can be included (not covered in the CEAP), such as:

- Soil and land use: rehabilitation of contaminated or depleted areas and brownfield sites;
- Water management: reuse/recycling of wastewater;
- Air: Reduction in air pollution in circular economy and/or eco-efficient production.

The ICMA indicators are applicable to projects and businesses (for an example see the templates and guideline at ICMA website (ICMA, 2025b)) and therefore they differ from the EU Circular Economy Monitoring Framework, applicable for reporting on the Member States' level.

Based on the GBP and basically repeating GBP's the eligible green project categories, together with ICMA the Loan Market Association (LMA) has introduced Green Loan Principles (GLP) in 2018 with a view to promoting consistency across financial markets (ICMA, 2025a). Albeit of voluntary nature, banks adopt the ICMA GBP to report on green finance (including circular economy finance) projects. Reporting such projects, however, might not be granular enough to identify the volumes of circular economy finance.

Additionally, ICMA publishes research and thought leadership papers. In respect of impact reporting, ICMA views circular economy metrics as sector-agnostic, relevant to all types of business operations, cross-cutting and supporting the environmental objectives defined in the internationally recognised environmental taxonomies (ICMA, 2021b). The guidance for issuers developed by ICMA refers to EU Taxonomy, which is analysed in Section 3.2.3 hereto (ICMA, 2023).

European Securities and Markets Authority (ESMA)

As the EU's financial markets regulator and supervisor, ESMA "*contributes to investor protection, reinforcing their ability to make informed choices; fosters integrity, transparency, efficiency, and*

functioning of financial markets; and enhances financial stability. ESMA is the key EU institution responsible for securities and capital markets supervision" (European Securities and Markets Authority, 2025). Its role in directing private finance through capital markets to decarbonised and circular economy is highlighted in the Draghi report (Draghi, 2024b).

The growing importance of sustainability is taken into consideration in ESMA's activities, thus making enabling sustainable finance one of the thematic drivers. ESMA has adopted its Strategy on Sustainable Finance in 2020 with reference to the EC action plan on financing sustainable growth (including circular economy) (ESMA, 2020). In 2022 ESMA adopted the Sustainable Finance Roadmap 2022-2024, which mentions EU Taxonomy and SFDR (ESMA, 2022). The policies and guidelines developed by ESMA consider sustainability and environmental objectives in general and do not refer specifically to the circular economy or other sectors. As the platform managing data on capital markets, ESMA conducts market monitoring and analysis and publishes respective reports (at countries' level, without details on sectors or eligible activities).

3.3.5 Interlinkages between ISO standards for circular economy and sustainable finance

In the area of international standardisation, standards are developed to provide frameworks in technical and non-technical fields with the aim to create uniform, high-quality and safe standards worldwide. Against this background, ISO standards also cover the fields of the circular economy and sustainable finance. While no specific link to the finance market was found in one of the top standards on circular economy [7], standards focusing on the topic of sustainable finance show such a reference. Similar to the EU Taxonomy that establishes a framework to classify economic activities as sustainable, such a tool has also been developed under ISO: "ISO 14030-3 Environmental performance evaluation – Green debt instruments – Part 3: Taxonomy" (ISO, 2022).

This standard defines the circular economy as an "*economy that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles*" (ISO, 2022). Thus, green debt instruments in the form of a green bond or a green loan seeking an ISO 14030 certification are eligible to invest in economic activities significantly contributing to a "*transition to a circular economy, waste prevention and recycling*" (ISO, 2022). Also including the concept of doing no significant harm (DNSH) to the non-core environmental objective, the circular economy shall also be considered in DNSH assessments.

[7] i.e. ISO 59020 Circular economy – measuring and assessing circularity performance (ISO, 2024)

3.4 Cumulative review of the analysis and discussions

Box 3.3: Chapter 3 Key Insights:

1. Alignment of circular economy definitions and concepts in the EU; however, lack of alignment of circular economy finance concepts and definitions;
2. Insufficient reference to 'safe and sustainable design' in reviewed finance policies, studies, methodologies; however, emphasis on 'waste as a resource';
3. Cross-cutting nature of circular economy requires sector agnostic approach by finance sector;
4. Potential of EU Taxonomy, reporting directives, and recognised industrial classification (which can serve as the basis for alignment of definitions) is not explored to full extent yet;
5. Definition and assessment of circular economy finance depend on indicators and databases.

- **Emphasis on waste and recycling as the easiest identifiable circular economy activities.** The challenge with spotting other circular economy activities lies in the intersection of circular economy activities with other sectors, like water, agriculture, air, energy, manufacturing. The description of eligible activities in these sectors (for example, in the MDB Common Principles, in the ICMA Principles) contains circular economy measures. It is worth mentioning that the MDBs reporting does not include circular economy as a category, although the MDBs report on solid waste and on water and wastewater management – typical circular economy sectors. Thus, circular economy finance on e.g. sustainable design and new circular business models is included in other sectors.
- **Intersection of circular economy with other environmental sectors** is considered also in the CSRD standard which mentions that climate change (energy), pollution, water and marine resources, and biodiversity and ecosystems intersect with circular economy. An evolving approach both for the finance market and for states is to consider circular economy a cross-cutting topic (e.g. bioeconomy or intersection with innovations at the EIB).
- In respect of the **EEA circular economy touchpoints**, the definitions used by the reviewed sources relate to all the EEA circular economy touchpoints with clear prevalence of 'waste as a resource' activities. It is a common fact that such activities are easier to spot and define as respective indicators are available even at the country level (EU CE Framework, Eurostat) and waste was the initial circular economy topic reflected at the regulatory level. Furthermore, 'longer and better use of products' is another touchpoint which is broadly covered by different frameworks employed by the finance sector. The least identifiable activities fall under 'safe and sustainable design'.

  Below is an overview of some methodologies and studies in respect of relevance of EEA circular economy touchpoints to the circular economy categories used by those methodologies and studies (detailed information is in the tables included in this chapter). Some methodologies consider more comprehensive circular economy economic activities than others; therefore, the overview below serves only to show the prevalence of the topics (number of activities or categories which are relevant per specific topic), not for comparison of methodologies or studies.

Table 3.12: EEA touchpoints in the reviewed policies, studies, methodologies

EEA touchpoints	IPSF CE categories based on ISIC (table 2)	EU Taxonomy (table 6)	MDB IDFC Common Principles (table 7)	ICMA GBP (table 9)	Total
Safe and sustainable design	2	5	4	1	12
Efficient production	2	3	8	3	16
Sustainable consumption	2	5	8	1	16
Longer and better use of products	3	11	4	1	19
Waste as a resource	9	14	7	2	32

Source: EAA analysis.

- **Representation of circular economy finance** can therefore be presented as a combination of the EEA circular economy touchpoints (cross-cutting) and the CEAP Key Product Value Chains or the key sectors a particular financial institution is focusing on (e.g. textiles, construction, packaging, etc).

  Potential of the EU Sustainable Finance Framework. The framework includes considerations on circular economy finance and therefore has a potential for supporting the assessment of the investment need, capital flows to sustainable investment, and the investment gap. In the finance sector (having assessed MDBs' approaches) the definition of circular economy references to EU CEAP and EU CE Categorisation system (which was the basis for developing of the EU Taxonomy). The latter is aligned with the five EEA circular economy touchpoints.
- **EU Taxonomy** has been applied as a foundation for the Platform on Sustainable Finance report on monitoring capital flows to sustainable investments in 2025. Specifically for circular economy assessment the EU Taxonomy is a useful tool, where all the EEA CE touchpoints are reflected while it covers only five out of seven CEAP key product value chains (not covering textiles and batteries and vehicles). Besides, EU Taxonomy can be linked to **NACE** economic activities classification, although NACE classification has got some limitations whereas not all activities included in EU Taxonomy can be mapped with NACE. EU Taxonomy is the tool that is taken into consideration also by the MDBs and referred to in ICMA (the EIB, for example, has developed own methodology for circular economy assessment, based on EU Taxonomy). Taxonomies are also developed in other regions of the world; thus, recognizing the high potential of this tool.
- The corporate and financial **reporting directives** are of use for providing information about companies or businesses (CSRD) and on investments or financial assets (SFDR). CSDDD can be omitted as it does not include detailed criteria on circular economy. The reporting directives represent a different source of information than the EU CE Monitoring Framework, which relies on statistical data of countries and does not provide the granularity of data that can be used by the finance sector. The CSRD can provide the data for tracking circular economy finance in banking as it implies a comprehensive reporting about activities on a company level, both qualitative and quantitative. Additionally, the companies obliged to report under the CSRD shall also report on EU Taxonomy alignment of their activities. There is no experience with the CSRD reporting yet (companies were to start reporting in 2025); therefore, it is yet to be explored how CSRD information relates to the EU CE Monitoring Framework – presumably, some quantitative indicators are similar. The SFDR implies reporting for financial products, to help investors make informed choices and invest into companies and projects supporting sustainability objectives. Albeit the SFDR informs investors on sustainability related financial products, it is not given that from the disclosure of sustainable financial products the share of

circular economy investments can be extracted. There is a risk of double counting of the same investment of financing if both CSRD and SFDR are considered simultaneously as data sources.

- Although the existing **European ecolabels for financial instruments** include reference to circular economy, the availability of granular data to assess investments into circular economy is questionable. The ecolabels mostly use a general reference to Articles 8 and 9 under SFDR.
- For the banking sector, the **MDB Common Principles** can be used as a guidance to support the development of circular economy finance. However, the Common Principles elaborate on a detailed list of general eligible activities for climate change mitigation finance, without a separate consideration of the circular economy. Reviewing the approach of the major MDBs, which provide most of climate finance to the EU, the conclusion can be drawn that each bank develops its own strategy towards circular economy with focus on the sectors most relevant for its portfolio. From all MDBs according to the annual MDBs Joint report on climate finance 2023, **EIB** stands out as the largest investor in the EU region. EIB is also the most advanced of the reviewed three largest climate finance investors in the region – EIB, WBG, and EBRD – in terms of methodologies on circular economy finance assessment. The **IFC** (a part of the World Bank) has just published the harmonised guidelines to support both finance and corporate sectors in realisation of circular economy projects.
- For the capital markets, **ICMA Principles** set up a foundation for a detailed data source, unified on a global level. However, the data presumably cannot be publicly accessed (some studies mention certain data providers and data management companies for green bonds). The limitation of this research is how the data can be filtered.

Assessment of circular economy finance depends on **indicators and databases**:

- The finance sector bases its analysis on information at a company's or project's level. Specific information can be available in case of reporting on Taxonomy aligned activities according to **NACE codes**. To address the limitations that not all Taxonomy activities can be mapped with NACE codes, a suggestion can be to develop NACE codes further.
- **CSRD** can serve as a comprehensive provider of information on a company's level. The data shall be publicly available European Single Access Point (ESAP) according to the ESAP regulation and shall include EU Taxonomy alignment. However, with ongoing discussions around the reduction of reporting scope and requirements via the Commissions Omnibus Proposals (EC, 2025g), the availability of data will probably be reduced to a small number of big corporates (>1,000 employees) across the EU.
- The following **circular economy indicators** can be of use for finance sector (referred to in interviews with DNB and BAFU):
    - The indicators used by a range of cities and organisations compiled by the Urban Agenda Partnership for Circular Economy, in collaboration with the EIB (EC, 2019)
    - Framework indicators for transitioning to a circular economy, developed by the WBCSD (WBCSD, 2023)
    - A recently published IFC Harmonised Guidelines suggests examples of indicators per circular economy strategies (IFC, 2025)

4 Assessment of current investments in the circular economy

This chapter outlines the methodologies applied to analyse existing funding sources supporting the transition to a circular economy. It draws on a combination of literature review and expert interviews (see Annex 1) to assess current estimates of circular economy investments. Particular attention is given to the use (or inconsistent use) of circular economy definitions, which may obscure funding gaps or distort investment metrics. The analysis also identifies commonalities across existing approaches and aims to quantify the volume of current investments into the circular economy.

4.1 Circular economy investments in the EU

Achieving the transition to a circular economy requires undisputably a significant investment. A top-down estimate from the EIB and the European Commission suggests that **achieving circular economy ambitions in the EU will require EUR 1.229 trillion in cumulative investments by 2040,** over current circularity investment levels. This figure is based on quantification efforts of circular economy-relevant impact assessments and policy scenarios at the EU level (EIB-EC, 2026).

As is explored in the previous chapter, the standardisation of circular economy definitions in relation to economic activities, strategies, and sectors has progressed in recent years. In the area of circular economy financing, however, further harmonisation of terminology and methodology is still needed. This would help to streamline capital flows towards circular economy projects and improve the monitoring and evaluation of such financing. According to the *Platform on Sustainable Finance* report *Monitoring Capital Flows to Sustainable Investments*, "*a comprehensive framework for tracking capital flows can further support EU policy decisions by integrating data on public investments and household spending*" (PSF, 2025b). At present, assessments of current investment levels and investment gaps vary due to differences in methodology and a lack of alignment.

This chapter analyses several existing frameworks, including those reviewed in the previous chapter, with the aim of identifying commonalities that could serve as a foundation for a future harmonised approach. See Table 4.1 and Chart 4.2 (in section 4.5) for an overview of the methodologies and kye numbers.

4.1.1 Insights from the Platform on Sustainable Finance (PSF)

According to the **Platform on Sustainable Finance (PSF***)*, "*the European Commission estimates that at least 7-8% of GDP annually must be directed toward green investments to meet 2030 and 2040 climate targets. The largest gaps remain in industrial decarbonisation, energy supply, and building renovations*" (PSF, 2025b). Among these broader green investment needs, the PSF has made an initial attempt to quantify investments into the EU Green Deal objectives, including circular economy transition.

The PSF assesses current **annual investment levels for the circular economy at EUR 18 billion**, out of a total of EUR 764 billion in sustainable investments. To meet 2030 targets, annual average investment needs for CE are estimated at EUR 28 billion, implying a 57% increase over current levels. In relative terms, this represents a small but growing share of sustainable finance activity. However, due to uncertainties in definitions and sectoral attribution, these estimates remain indicative, in particular for the circular economy, biodiversity, and climate adaptation objectives (PSF, 2025a).

This assessment was published in 2025 as the first EU-level attempt to assess capital flows into sustainable investments relying on the EU Taxonomy framework. The PSF methodology is primarily

based on reporting data from large, publicly listed companies subject to the Non-Financial Reporting Directive (NFRD). It integrates regulatory data, including Taxonomy-aligned Capital Expenditures (CapEx), and provides additional geographical and sectoral insights through in-depth analysis (PSF, 2025b). Although the EU Taxonomy provides a common reference, current assessments remain limited by definitional inconsistencies, methodological variation, and incomplete data coverage – particularly for objectives such as the circular economy, as circular business models often do not fit conventional investment structures (Ghisetti and Montresor, 2020).

The PSF aggregates data from multiple sources to assess capital flows into sustainable activities. At the end of 2023, **the total outstanding amount of green debt financing stood at EUR 1.15 trillion.** In the **real economy**, it draws on Taxonomy-aligned CapEx by corporates (EUR 250 bn in 2023) and a corporate-level analysis identifying firms with elements of credible transition plans (EUR 206 bn) (PSF, 2025a). Taxonomy-aligned CapEx is assigned to sectors using NACE codes. For the circular economy, the most relevant sectors in this classification include water supply and waste management, construction, mining and quarrying, manufacturing, transportation and storage, and ICT. However, alignment with the EU Taxonomy differs significantly across these sectors. In manufacturing, for instance, only 9% of reported capital expenditure is Taxonomy-aligned. Among these sectors, water and waste-related activities receive the bulk of aligned investment, with construction following (PSF, 2025b).

The corporates with elements of credible transition plans, considered in **transition** analysis, represent ICT, manufacturing, transportation and storage, and construction circular economy-related sectors. In respect of Taxonomy alignment, the manufacturing sector is dominated by carmakers, which are under regulatory pressure for low-carbon transitioning (PSF, 2025b).

For the **financial sector**, the PSF analyses the alignment of financial instruments with environmental objectives using both the Sustainable Finance Disclosure Regulation (SFDR) and Pillar 3 data from the European Banking Authority (EBA) (PSF, 2025a). The EBA is the EU supervisory authority responsible for ensuring transparency and consistency across the banking sector. Pillar 3 refers to the regulatory framework under the Capital Requirements Regulation that requires banks to publicly disclose information on risks, including their exposure to sustainability-related activities. However, the coverage remains uneven across instruments.

- For **loans**, EBA Pillar 3 data identifies Taxonomy-aligned volumes and loans financing other climate change mitigation actions, but no sectoral breakdown is provided. The EBA Pillar 3 hub is currently under development and expected to deliver more detailed reporting by 2026.
- For **bonds**, the analysis of green bond issuance by NACE section reveals that green bonds in circular economy-relevant sectors (ICT, construction, manufacturing, transportation and storage) account for just 6% of the total EU issuance. An additional 43% of green bonds are allocated to the “other” category, which may also include circular economy-related activities, but cannot be disaggregated based on available data.
- For **equity instruments**, particularly private equity, the data remain highly limited. No green labels or sustainability markers exist yet for private equity products, and most firms in this segment fall outside the scope of mandatory sustainability disclosures.

Consequently, there is no reliable information on sectoral allocation of private equity financing towards circular economy activities. Nevertheless, the PSF notes that from 2021 to 2023, private equity and venture capital firms invested EUR 39 billion in European climate, clean tech, and low-

carbon energy companies, and EUR 224 billion in broader sustainability-related sectors. While no sector-specific breakdown is available, it is reasonable to assume that a share of these investments contributes to circular economy transitions (PSF, 2025b).

The PSF also includes more detailed analyses of the power and automotive sectors, which currently dominate green debt financing in the EU. Comparable sectoral deep dives for circular economy-relevant sectors could become feasible as disclosure standards mature. The report concludes by emphasising the transformative potential of the **EU Taxonomy**:

"The EU Taxonomy disclosures have granted unprecedented insights into the sustainability of the economic activities and greenness of EU companies' capital investments. Recent figures on Taxonomy-aligned CapEx show that a broader greening of the EU economy is underway, a view that the strength of the EU green bond market also supports. The establishment of a virtuous circle between Taxonomy reporting and Taxonomy-based instruments (such as the European green bond standards or, in the future, Taxonomy-aligning benchmarks) may further support this positive dynamic."

At the same time, the PSF notes some limitations and regional imbalances in relation to green finance in the EU:

"To date, the successful implementation of the Taxonomy regulation remains too limited to a few leading countries, where large corporations, with sizable portions of their investments earmarked as Taxonomy-aligned, are domiciled. Credible transition plans are even more restricted geographically and absent from Central and Eastern Europe, where the stakes of the green transition are often the highest. The same regional imbalances apply to the capital markets with the issuance of green bonds and also reflected in green asset ratios for banks' loan portfolios" (PSF, 2025b).

Thus, given sector-agnostic nature of the circular economy, assessment of information on circular economy capital flows is still rather complicated, as the comprehensive PSF analysis of capital flows shows. The PSF assesses sustainable capital flows using multiple data sources, covering real economy, financial sector, and transition areas. The PSF methodological details reveal uncertainties in the assessment process in relation to environmental objectives like circular economy as well as expectations of improved data that will be available in the coming years, particularly for financial sector data. There is a potential for deriving more detailed information on circular economy financing from current data in real economy and from future (expected) data in financial sector. Application of EU Taxonomy and NACE sector differentiation for analysis supports the findings of the previous chapter. The PSF work reenforces the bottom line of the previous chapter that financial sector is standing at the early stage of circular economy understanding; however, it is moving towards better embracing of circular economy concept.

4.1.2 Tracking financing under the EU Circular Economy Monitoring Framework (EU CEMF)

The **EU Circular Economy Monitoring Framework (EU CEMF)** covers five thematic areas, each monitored using indicators sourced from Eurostat. The thematic area "Competitiveness and innovation" includes an indicator on private investments in the circular economy, expressed in billion euro and as a percentage of gross domestic product (GDP).

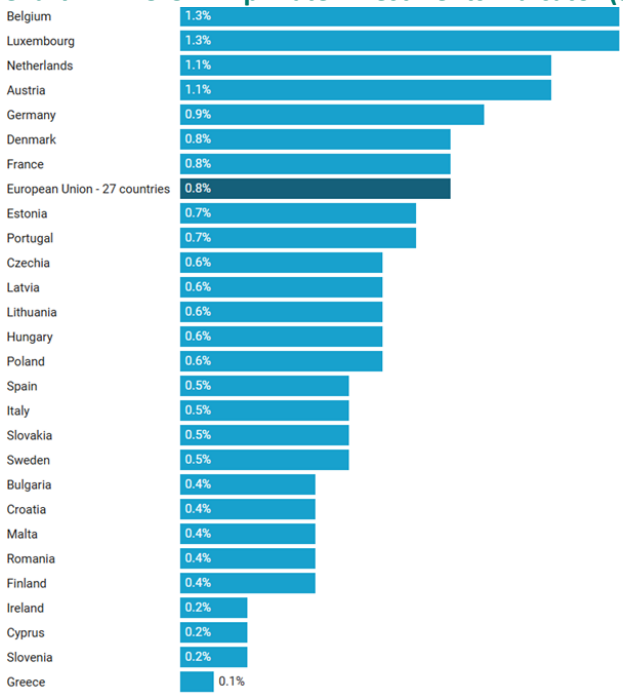
Since 2020, this indicator has remained stable at 0.8% of GDP at the EU level, with the most recent update provided in 2023 (Eurostat, 2025a). Given that EU GDP in 2023 totalled EUR 17,204 billion (Eurostat, 2025b), this corresponds to approximately **EUR 137.63 billion in private investments in circular economy activities.** As the EU's GDP continues to grow annually, private investment in the

circular economy has been increasing at an even faster pace – rising by 13% to EUR 121.6 billion in 2021, following a 45% increase from EUR 84 billion in 2015 (EC, 2018).

Note that this indicator is calculated based on a categorisation of economic activities related to the circular economy as defined through a sector classification that reflects sectoral purpose. The underlying data on turnover and value added, used for the private investments indicator, are sourced from administrative records and the business register (EC, 2018).

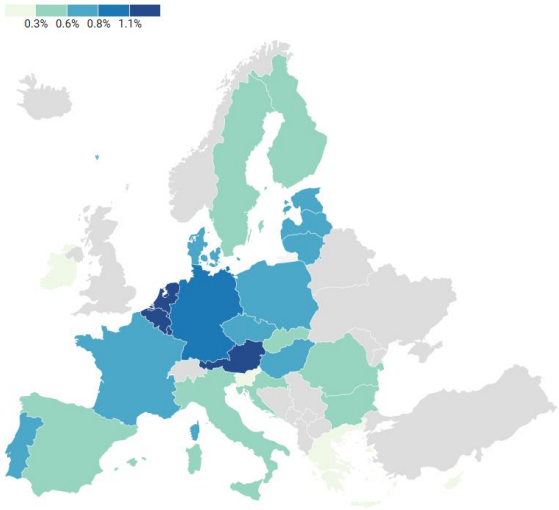
Chart 4.1 and Picture 4.1 reveal significant cross-country variation in private investments towards the circular economy. The top Member States directing larger percentage of their GDP into circular economy investments than the EU average are Belgium, Luxembourg, Netherlands, Austria, and Germany. This aligns closely with international comparative studies on the uptake of circular economy strategies in the EU (Claudio-Quiroga and Poza, 2024; D'Adamo et al., 2024). These differences are also illustrated in Austin and Rahman's (2022) classification of EU Member States into "leaders," "performers," and "catchers". Their empirical findings suggest that even under cohesive EU policies, the uptake of circular strategies is strongly conditioned by national institutional contexts, which affect the alignment between funding availability and firm-level access. This highlights the importance of further disaggregation by institutional context for accurate gap assessments.

Chart 4.1: EU CEMF private investments indicator (as a % of GDP)



Source: Generated by VITO based on EU CEMF Statistics | Eurostat (Eurostat, 2025a).

Picture 4.1: EU CEMF private investments indicator on EU map (as a % of GDP)



Source: Generated by VITO based on EU CEMF Statistics | Eurostat (Eurostat, 2025a).

Of five of these countries, case studies are conducted for four (Austria, Germany, Luxembourg, and the Netherlands) based on desk research and interviews with stakeholders in these states. The case studies explore approaches to financing the circular economy in the countries, highlighting the peculiarities and practice examples (see Section 4.3).

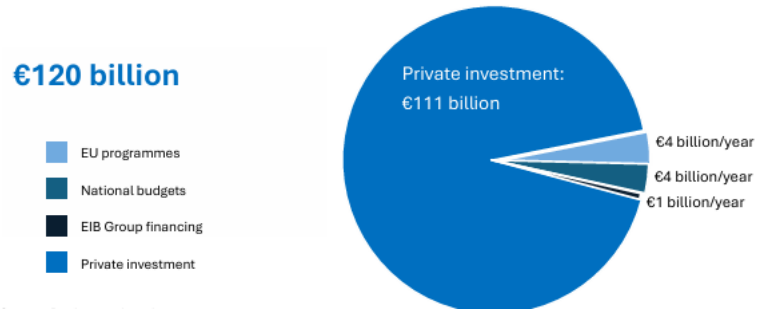
4.1.3 Assessment of current circular economy investments and gaps (EIB-EC report)

In response to the concerns raised by the European Court of Auditors in its Special Report 17/2023 on the progress towards circular economy in the Member States and on the effectiveness of EU instruments to support this (European Court of Auditors, 2023), the EIB and the European Commission commissioned an external study by consultants[8]. The study aims to provide a baseline of current investments into circular economy activities, estimate future investment needs up to 2040, identify the investment gap between the baseline and projected needs, and assess bottlenecks that hinder the uptake of available funding and financing as well as providing some recommendations how to overcome them.

The EIB-EC study concludes that **total annual investments** in the circular economy within the EU currently amount to **approximately EUR 120 billion** (EIB-EC, 2026). Of this total, EUR 111 billion is estimated to originate from private sources, while public investment contributes EUR 9 billion. This distribution implies that around 93% of current circular economy investment stems from private actors, with only 7% coming from public sources. It is important to note, however, that these figures are derived from a mix of EU funding data and company-reported data and may blur the distinction between public and private funding, depending on the nature of investment flows and how they are reported. Estimates of current investments represent a levelized average over a certain period while for the investment gap estimation mid-point values of expected minimum and maximum values are considered, not providing a clarity on the intensity of investment in different points (start/end) of the period.

[8] The EIB-EC report partly relies on underlying work by external consultants (Trinomics and consortium partners) and partly goes beyond that, with the summary report prepared by EIB and DG Environment.

Figure 4.1: Annual investments into circular economy in the European Union



Source: Reproduced from the EIB-EC report (EIB-EC, 2026).

The estimation of **private investment levels** was based on a *top-down approach*, which relies on the classification of economic activities according to the NACE system. A comprehensive list of 132 NACE codes relevant to the circular economy was compiled, drawing on various sources, including the EU Circular Economy Monitoring Framework, the EU Taxonomy, the Ecodesign Regulation, and prior studies by Prognos and Devstat. These sources differ in scope and sectoral emphasis; for instance, one of the lists was shorter than the others but included a broader range of sectors. Each selected NACE code was then matched to one thematic heading of the Circular Economy Action Plan (CEAP). Some NACE codes could fall under several CEAP headings, as some CEAP headings are sector-agnostic whereas others represent the Key Product Value Chains – in such a case the NACE codes were attributed to the most relevant CEAP heading, to avoid double counting. This has influenced the outcome of the analysis, as, for instance, the CEAP heading on sustainable design appeared underrepresented due to (parallel) inclusion of its relevant NACE codes under respective Key Product Value Chain CEAP headings (EIB-EC, 2026).

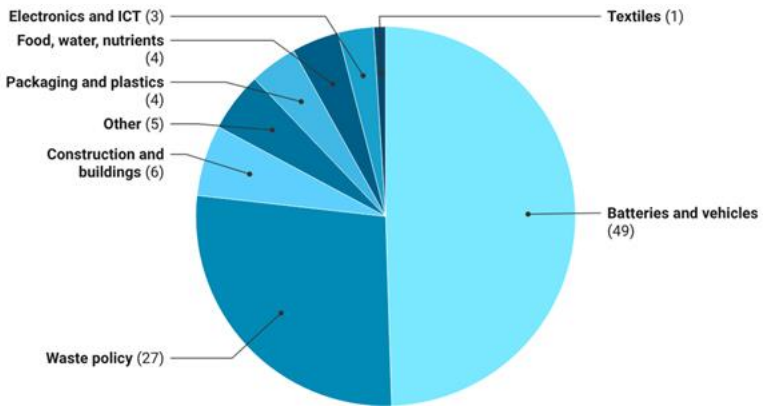
To estimate current investment volumes, the study used data on gross investment in tangible assets (such as machinery and equipment) across the identified NACE codes. Given the limitation of NACE codes whereas they do not directly convey how much an activity contributes to a circular economy, each code was assigned a coefficient reflecting its level of alignment with circular economy principles. Activities strongly associated with circular strategies, such as repair, rental, reuse, and recycling, were assigned a 100% coefficient. Whenever possible, the methodology uses coefficients based on recycling and recovery rates in the manufacturing process, based on available industry and regulatory reports. For example, for the NACE code 'Manufacture of pulp, paper, and paperboard' the coefficient of 0.75 was applied, given that the recycled material part in manufacturing of paper-based packaging in the EU constitutes 75%. In cases where direct alignment data were unavailable, a standardised approach assigning coefficient of 5%, with sensitivity tests of 20% and 30% was applied (EIB-EC, 2026).

A *bottom-up approach* to estimating investments, based on data from individual Member States, was also attempted; however, inconsistencies in definitions and limitations in data availability made it impossible to generate comparable national estimates across the EU. Several case studies beyond the EIB-EC study incorporated in Section 4.3 hereto support this statement.

Public investment estimates were derived from policy documents, EU funding programmes (which are often more tailored to larger infrastructure projects), and regulatory instruments associated with the CEAP. While EU funding data was available by country, in some other cases, the lack of granular data at the Member State level introduces some uncertainty into these figures. Moreover, due to the cross-cutting nature of the circular economy, some investment needs may fall under broader policy categories and are therefore not fully captured under explicitly circular economy headings. Thus,

projects contributing to a circular economy (e.g. new services, redesign, etc) are linked to other environmental objectives, not circular economy. A clear understanding what circular economy funding is for national funding management needs to be achieved.

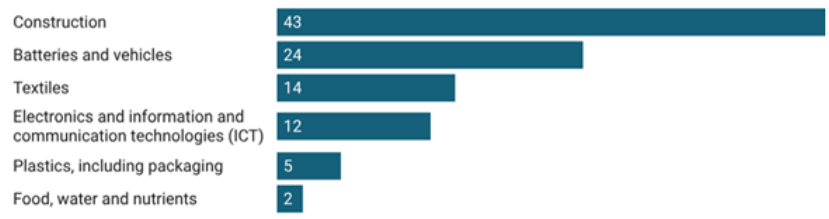
Figure 4.2: Split of current circular economy investments per sector, 2021 (% of total)



Source: Reproduced from the EIB-EC report (EIB-EC, 2026).

The **estimated investment gap** for the EU circular economy transition is estimated at **circa EUR 82 billion per year**. This figure is based on the assumption that current investment levels represent a baseline and are therefore not counted towards future needs. The study finds that the largest need, 34% of the total investment gap, relates to sustainable product design, particularly the implementation of the Ecodesign for Sustainable Products Regulation (ESPR), significant part of which can be attributed to key value chains identified by the CEAP. This finding reinforces earlier observations in this report that sustainable design remains one of the most underfinanced circular economy strategies, despite being critical to delivering systemic change. The gap also highlights the capital intensity required to operationalise the ESPR across value chains. Beyond sustainable design, 27% of the total investment gap needs to be covered for 'end of product life'. The study identifies further that investment needs across several key product value chains account to 51% and remaining 49% need to be invested into cross-cutting sectors and activities. In descending order of estimated investment requirement, the key value chains include construction and buildings (EUR 18 billion per year); batteries and vehicles (EUR 10 billion per annum); textiles (EUR 6 billion per annum); ICT and electronics (EUR 5 billion per annum); plastics (EUR 2 billion per annum); and food, water, and nutrients (EUR 1 billion per annum). These priority sectors mirror the structure of the EU economy and the sectoral focus areas defined within the CEAP (EIB-EC, 2026).

Figure 4.3: Circular economy investment gap, by key value chain (% of total, total: € 42 billion p.a.)



Source: Reproduced from the EIB-EC report (EIB-EC, 2026).

The study estimates both the split of current circular economy investments per key value chain and current needs per sector, showing an incongruence between the two.

Despite the value of the estimates provided, the study acknowledges several methodological limitations that affect the robustness of the results. These include variation in how different sources map NACE codes to circular economy activities and the subjectivity involved in assigning alignment coefficients. The failure to develop a harmonised bottom-up estimation method also highlights persistent finance data availability issues at national level (e.g. national CE strategies and plans) and data quality issues in the monitoring of those. These limitations suggest that the actual investment needs for a successful transition to a circular economy may exceed the figures presented. Moreover, given the disproportionate reliance on private funding, the role of public investment – particularly at national and regional levels – warrants further scrutiny. The case studies presented in Section 4.3 provide additional context, illustrating how investment patterns and financing mechanisms vary between Member States and highlighting national efforts to address specific gaps in circular economy funding.

4.1.4 The Circularity Gap Report: Finance

The *Circularity Gap Report Finance* is a study produced by Circle Economy, with contributions from KPMG and a wide coalition of partners including multilateral institutions, think tanks, and development banks. It was released in 2025 as the first global effort to systematically track investments in circular economy businesses at the deal level (Circle Economy, 2025a). Their overarching purpose is to establish a baseline for circular economy finance, both by quantifying the scale of commercial investment and by categorising flows according to their sources, instruments, supported business models, and target sectors.

According to their results, global commercial investment in circular economy businesses between 2018 and 2023 amounted to approximately USD 164 billion, averaging USD 27 billion annually. This represents only around 2% of total tracked commercial investment. European businesses attracted an annual average of USD 15.5 billion, representing 57% of global circular investment - more than all other regions combined. At the level of business models, finance for linear businesses raising capital to support their shift towards circularity (labelled **transition finance**) accounted for 35.7% of total flows, while circular business models absorbed the rest, with recovery activities receiving the largest share (27.5%), followed by use models (23.5%) and design and production initiatives (4.7%). Although overall investment in circularity is growing, it remains concentrated in relatively conventional applications such as vehicle repair, online resale platforms, and organic waste recovery, while higher-value and more transformative models remain severely underfunded (Circle Economy, 2025a).

Circle Economy applies a bottom-up methodology that aggregates individual investment deals, primarily sourced from proprietary databases such as Pitchbook, to establish a baseline for circular economy finance. By focusing on “available market finance” - capital raised externally by businesses through loans, equity, or grants - the report aims to capture commercially deployed funds that any prospective enterprise might access. However, the authors emphasise that the estimates are conservative due to several important limitations. Bonds are excluded, since it is often impossible to determine whether proceeds from corporate issuances are allocated to circular purposes. Investment in small and medium-sized enterprises is likely underrepresented, given data availability constraints, and project-level or programmatic funding from development finance institutions is excluded. Moreover, the report tracks businesses at the deal level based on their primary activity or specified transition finance, which means that circular components of broader corporate investment strategies may be missed. Finally, data coverage is geographically uneven, with European and North American sources far more complete than those of other regions (Circle Economy, 2025b).

4.1.5 The overview of circular economy financing assessment methodologies

In the attempt to compare the most recent approaches and framework for assessing investments in a circular economy in the EU, the table below was compiled providing an overview of the frameworks analysed, in terms of methodology, data sources, limitations, and estimation.

Table 4.1: Circular economy financing assessment methodologies overview

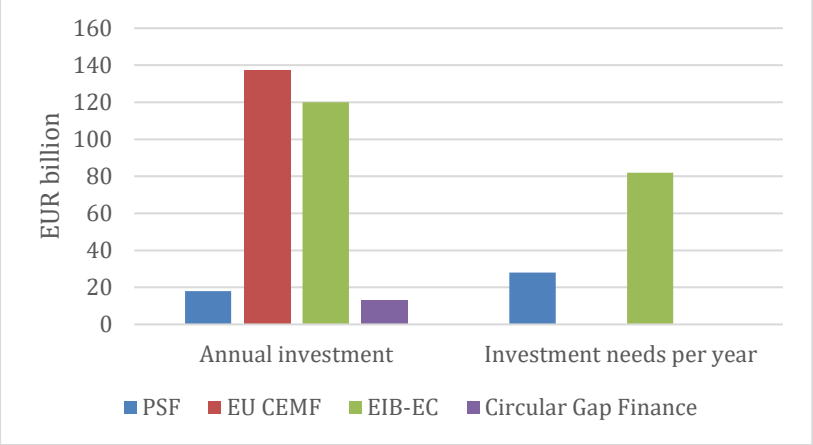
Framework /study	Methodology	Data sources	Limitations	Estimation
Monitoring of capital flows by the PSF (by EC)	*Primarily based on **EU sustainable finance regulatory data and definitions.** ***CapEx data** forms the core of the methodology: corporate investments can contribute to the EU environmental objectives. *The focus is primarily on financial market flows originating from **EU-domiciled entities and financial instruments**. *Includes investments made by companies whose transition plans contain elements of credible transition. *Public expenditure is outside the mandate´s scope. *The capital flows that cannot be defined as sustainable but do not cause significant harm and flows that would cause significant harm are excluded. *Financial sector analysis done in respect of loans, bonds, equity, and investment funds.	<u>Real economy data:</u> ***Taxonomy** alignment reporting - Bloomberg *Corporates in transition: Voluntary reported data - **CDP Net-Zero Alignment dataset (NZAD) or ORBIS** - if regulatory data is missing <u>Financial sector:</u> *Green bonds - **DeaLogic** *Loans - **EBA, GAR (Taxonomy based)** *Public equity - **DeaLogic ECM** (with NACE attribution based on Orbis, matching ISIN from ECM) *Private equity - **Pitchbook/ S&P /ORBIS** *Funds - **Morningstar** *Banks in transition - **EBA Pillar III, NZBA** *Asset owners in transition - **NZAOA** <u>Sectoral allocation:</u> by **NACE** codes	*Data availability (Data source harmonizing as considered by the European Single Access Point (ESAP), available from mid-2027) *Data quality, inconsistency *Lack of interoperability of common definitions on what 'sustainable' *Voluntary reported data is used *Upgrades in disclosures and reporting needed *Limitations on assessing overall alignment with the EGD goals *Blended finance is not integrated: improvement of methodology is required *Public sector investments are included only from companies eligible for CSRD reporting *Strict confidentiality constrains for ECB's data of financial institutions	<u>Current</u> annual investment levels for CE: **EUR18bn p.a.**(of total EUR764 bn) Total <u>investment needs</u> for CE p.a. until 2030: **EUR28bn p.a.** (+57%) (of total EUR1244 bn)
EU circular economy monitoring framework (by EC)	*Under 'competitiveness and innovation' thematic area there is an indicator on **private investment and gross value added related to circular economy sectors**, representing a percentage of GDP. *A sector classification by purposes *Using existing lists of goods and services, presenting identified economic activities including the corresponding **NACE, CPA and PRODCOM codes**. *Calculation is done for assessing **gross investments in tangible goods.**	*European Statistical System ESS **(Eurostat)** *Eurostat calculations based on official statistics such as structural business statistics **(SBS),** which relate to activities at **NACE** class level; **PRODCOM,** relating to products manufactured per **NACE** codes; national accounts and others	*Limited usage of this indicator for the finance sector. *Limitations of the NACE codes used - not all activities can be covered. *Interoperability with other methodologies or frameworks need to be explored.	<u>EU current investment</u>: 2023 private investments to CE in the EU: **EUR137.6bn** (0.8% of EU GDP)

EIB-EC report	*Use of data from national accounts on statistics for annual business investment, which is available on a **NACE code** basis, for the data on private and public investments. *Selection of **CE-related NACE codes** from different sources. Retrieving **statistical data** for each NACE code on **gross investments in machinery and equipment**. *The **list of circular economy goods and services** is matched with existing classifications NACE. *"For EU/EIB programmes: budgets' approved expenditures for circular economy-relevant intervention fields/ sub-programmes/ guarantees. ***Coefficients,** ranging from 5% to 100%, were applied to estimate the portion of investment attributable to circular activities in each sector. *Investment needs and gaps are assessed based on **EC impact assessment** information.	***Eurostat** (SBS), based on **NACE** codes. Net turnover and investments data. ***Prognos/Devstat** (2023) Project "Economic Aspects of Circular Economy" - identifying CE activities ***EU Taxonomy NACE** codes ***EU CEMF NACE codes** for the indicator "Private investment, jobs, and gross added value related to CE sectors" ***NACE codes from Ecodesign** for Sustainable Products Regulation *Information from the EU, EIB, and other banks' funding programmes; relevant NACE-code expenditure figures on MS and EU level. *EC impact assessments for estimating the investment needs and the gap. *MSs' reports and strategies	*Difficulty is matching of circular economy goods and services to a single NACE code due to cross-cutting nature**.** *Application of coefficients per NACE code: using standardised coefficients when sectoral contribution to a CE is not defined. Some coefficients are assigned based on industry data on recycling and recovery rates, which cover only a part of CE activities. *Inconsistent data from banks and from MSs – data quality and data availability issues. *Risk of exclusion or under/overrepresentation of some NACE codes. *Usage of planned or committed amounts in EU funds when spending data is lacking.	<u>EU current investment</u> into CE: **EUR120 bn p.a.** <u>CE investment needs:</u> **EUR1.229trln by 2040** (assuming current investment is not included), requiring additionally **EUR 82bn p.a. or 68%** increase in investment
Circularity Gap Report Finance	*Bottom-up approach aggregating individual deals at company level rather than relying on institutional disclosures. *Focus on *available market finance* (loans, equity, grants) raised externally by businesses. *Distinguishes between *circular business models* and *linear businesses raising capital for transition*. *Classifies investments into three categories: Design & Production, Use, Recovery. *Tracks flows along four dimensions: sources, instruments, business models, sectors.	*Proprietary global investment databases tracking deal-level activity (Pitchbook) *Supplemented by public and private financial reports where available. * Relies on green and sustainability-linked loans data for capturing *transition finance*.	*Excludes bonds *Likely underreporting of SMEs and informal sector investment. *Excludes project-level/programmatic funding from DFIs and government subsidies. * Geographic bias: Europe and North America much better covered than Asia, Africa, South America. *Conservative low-end estimates	*Global 2018–2023: ~USD164bn total, ~USD27bn annually (2% of tracked investment). *Europe: **~USUSD15.5bn annually** (57% of global CE investment). *Business models: Transition finance 35.7%; Recovery 27.5%; Use 23.5%; Design & Production 4.7% .

Source: EAA and VITO compilation based on information from PSF, EU CEMF, EIB-EC, Circular Economy.

Although the most recent approaches differ in scope and results, the same data sources are used: Eurostat, Prognos/Devstat, Prodcom. The reviewed approaches explore the idea of utilising NACE codes. The recent EIB-EC study researches the NACE codes not only suggested for the EU Taxonomy, but also for the EU CEMF and the Ecodesign regulation. The limitations point out in the direction of solutions: enhancement of data quality, data availability, and alignment. Lack of harmonisation of methodologies does not allow comparability of the estimates (see the chart below).

Chart 4.2: Annual CE investments and CE investment needs in the EU



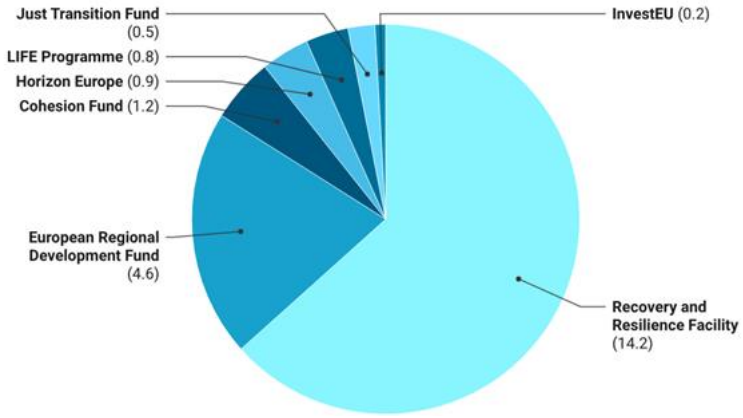
Source: EEA compilation based on the Table 4.1. above.

4.2 Investments by EU funding programmes

A range of European funding programmes under the Multiannual Financial Framework (MFF) 2021-2027, alongside the Next Generation EU programme (NGEU), support the objectives of the European Green Deal (EGD), including the transition to a circular economy. In addition to the Recovery and Resilience Facility (RRF) under the NGEU, several key programmes contribute to the EU's green transition, notably the Cohesion Policy, the Common Agriculture Policy (CAP), the European Maritime, Fisheries and Aquaculture Fund (EMFAF), the Just Transition Fund, Horizon Europe, the LIFE programme, and the Connecting Europe Facility (ETC CE, 2024e).

According to the findings of the report by EIB-EC (EIB-EC, 2026), several EU funding instruments provide direct or indirect support to circular economy objectives. These include the Cohesion Fund, the Just Transition Fund (JTF), the European Regional Development Fund (ERDF), Horizon Europe, the Recovery and Resilience Fund (RRF), and the LIFE Programme. The largest support from the EU funding instruments is attributed to the RRF (63%) and the ERDF (21%). Figure 4.4 presents the circular economy-related allocations within these funds, expressed both in absolute terms and as a proportion of the total EU funding directed to circular economy.

Figure 4.4: EU funding directed to the circular economy, 2021-2027 (€ billion)



Note: For InvestEU, only the EU guarantee is captured above. For Cohesion policy funds, only the EU amount is captured and the applied coefficients may differ from those published by DG REGIO. Official data on the total amount with national co-financing is available under https://cohesiondata.ec.europa.eu/stories/s/21-27 Circular-economy/t6h5-3fup.
Source: Reproduced from the EIB-EC report (EIB-EC, 2026).

In total around 1% of the EU Budget is spent on circular economy objectives, with the Recovery and Resilience Fund making the biggest contribution. Note however, as pointed out by Kumar et al. (2024), that the effectiveness of these programmes may be undermined by limited awareness among firms, particularly SMEs, about how to access funding. The efficiency of circular economy projects financed via the programmes differs and needs improvement (European Court of Auditors, 2023).

Some funds (European Maritime, Fisheries and Aquaculture Fund (EMFAF); European Agricultural Fund for Rural Development (EAFRD)) are not included in EIB-EC funding volumes calculation because tracking is not possible/feasible.

Thus, circular economy accounts to 1% of the EU funding programmes designed to support the EGD objectives, not specifically tailored solely for circular economy. As recommended in the (European Court of Auditors, 2023) more funding should be channeled towards underfunded areas of circular economy like circular design, which shows big impact potential for a transition via the prevention of waste during the use-phase. Development of a robust methodology to map the funding provided under the EU programmes per circular economy areas or EEA touchpoints would be useful.

4.3 Case studies of circular economy finance in EU Member States

As mentioned in Section 4.1.2, the approaches to circular economy financing in the four out of five top Member States directing larger percentage of their GDP into circular economy investments than the EU average are explored and summarised in country case studies. In addition to the EU CEMF private investment indicator, EIB-EC estimates countries' contribution to circular economy development at the EU level based on Eurostat data on gross investments in machinery and equipment, which is assumed to be representational for the assets critical for the circular economy. Both the private investment indicator and the estimates based on investments in machinery and equipment are influenced by the composition of the economy of the country. The higher private investment indicator (in terms of GDP percentage) potentially could serve as a confirmation of significance or prioritisation of the circular economy in the country; therefore, such Member States could provide best practice examples. The latter is impacted also by the size of the economy: the larger states show a larger contribution; thus, automatically the larger states have a larger potential of impacting the overall EU level transition into circularity. The four Member States have the following contributions (as of 2021):

- Austria: EUR 2,488 million, or 2.4% - the 9th of EU27;
- Germany: EUR 40,304 million, or 39.3% - the largest among EU27;
- Luxembourg: EUR 697 million, or 0.7% - the 16th of EU27;
- the Netherlands: EUR 1,287 million, or 1.3% - the 14th of EU27.

4.3.1 Country case study: Austria

Figure 4.5: Austria CE country profile

GDP: EUR 478.2 billion (2.8 % of EU27 total in 2023)

GDP per person: EUR 52 370 in 2023 (purchasing power standard) (122.4 % of EU27 (from2020) total per person)

Use of materials (domestic material consumption (DMC))
154.4 million tonnes DMC (2.4 % of EU27 total in 2022)
17.1 tonnes DMC/person (120.0 % of EU27 average per person in 2022)

Structure of the economy (2023):
Agriculture: 1.5 %
Industry: 29.4 %
Services: 69.2 %

Employment in circular sectors:
49,173 people employed in CE sectors (1.1 % of EU total in 2021)
People employed expressed as a percentage of total employment: 1.1 % (compared to 2.1 % for EU average in 2021)

Surface area: 83,879 square kilometres (2.0 % of EU27 total)

Population: 9,104,772 (2.0 % of EU27 total in 2023)

Note: all definitions and metadata used in this profile are taken, as shown, from Eurostat

Source: Replicated from EEA circular economy country profiles (ETC CE, 2024d)

Circular economy in Austria

Austria has tenth largest material footprint (raw material consumption) in the EU, which, notwithstanding decreasing gradually since 2010 from around 25t to 20t per person in 2023, nevertheless exceeds the EU average of 14.1t per person in 2023. At the same time, Austria shows steady improvement of their resource productivity, which is the 10th highest gross domestic product to domestic material consumption ratio in the EU in 2023: around EUR 2.6 per kg vs EUR 2.2 per kg EU average. The country's circular material use rate is higher than the EU average (13.8% in 2022 compared to the EU average of 11.5%). The Austrian economy is service focused and has material import dependency of 41.5%, which is higher than the EU average of 22% (ETC CE, 2024a).

The key Austrian circular economy strategies, reviewed below, propose over 300 measures, to be implemented by 2030. The Austrian ministries govern the implementation of the strategies. One of the successful outcomes is the circular economy measure "repair bonus" for electrical and electronic equipment, introduced in April 2022 (BMLUK, 2024). Since its introduction, around 840,000 vouchers have already been redeemed, mostly for mobile phones (~185,000), dishwashers (~42,800), and washing machines (~41,000). Outputs from all other circular economy measures can be identified by using progress reports.

Policies on circular economy

Austria has **three key strategies** in relation to circular economy that also include instruments to reduce the circular economy investment gap. First, the **Circular Economy Strategy** (BMK, 2022b). The strategy has dedicated a section on finance and funding with the focus on funds for the circular economy, the balance of market distortions, strengthening socioeconomic businesses, and the expansion of private financing. Overall, the strategy includes more than 100 different measures. With respect to private financing, the **Green Finance Agenda** aims to mobilise capital for climate and environment friendly projects (BMK, 2023). This agenda is also a leverage for circular economy measures towards a climate-neutral economy. Second, **the Bioeconomy Strategy** (BMNT; BMBWF; BMVIT, 2019). The bioeconomy

strategy is intended, among other objectives, to mobilise private capital and thus also to strengthen the Austrian financial pillar. By 2030, the share of investments in bioeconomy companies of all sizes from private sources is expected to increase significantly. Overall, the action plan includes 112 different measures (BMLUK, 2022). Third, the **Raw Material Masterplan 2030** (BMLRT, 2021) aims to secure a sustainable and affordable raw material supply. It covers raw material production from domestic mining and recycling as well as raw material imports. Among other aspects, the plan highlights financing for the exploration and extraction of primary raw materials and the development of recycling technologies for secondary raw material production. Overall, the masterplan includes 75 different measures.

Circular economy finance

In addition to EU CEMF private investment indicator, Austria monitors its circular economy expenditures for example under the **Green Investment Report** 2024 (ÖBFA, 2025), which assigns public, federal expenditures to eight different categories of Green Expenditures as listed in the Green Framework published in April 2022 (ÖBFA, 2022). The category "Environmentally sustainable management of living natural resources and land use" includes expenditures for circular economy. It is noted that in 2024, **Green Budgeting Methodology** has been applied for the initial screening of Green Expenditures for the first time. The next Green Investment Report will include an analysis of the budget in view of the environmental objective "Transition to circular economy" of the **EU Taxonomy**. In terms of scope, it is noted that the budget analysis includes only federal expenditures including co-funding and not expenditures by provinces in Austria (rolling out green budgeting at the level of local governments is in progress). Out of the 43 expenditure categories defined by the recent **Austrian budget plan**, the category 43 on "environment, climate and circular economy" includes the sub-chapter 43.02 on "circular economy, chemistry and radiation protection" (BMF, 2025a). In view of circular economy, the objective is the reduction of resource consumption by promoting sustainable design, extending the service life of products, the prevention and recycling of waste, and the production and use of high-quality low-emission secondary raw materials. The expenditures of EUR 46.9 m are allocated to the funding area circular economy in context of the **Environmental Funding Act** (BGBl. Nr. 185/1993, last revision by BGBl. I Nr. 26/2022, 2022). In Austria, there are close to one thousand institutions on federal, provincial, and local level that provide financial subsidies for private persons, companies, non-profit organisations, and public institutions (Transparenzportal, 2025). A **special funding portal for circular economy**, which was updated in 2022, covers 242 different funding opportunities for circular economy projects and measures (alchemia-nova GmbH, 2022). The operational objectives of the Circular Economy Research, Technology and Innovation (RTI) Initiative were used to define the scope of the database. These objectives are lifetime extensions of products (e.g. through reuse and repair), optimisation of resource use (e.g. through product design and waste prevention), and the closing of material loops (e.g. through recycling and secondary raw material use). These objectives are taken from the circularity strategies within the product chain (Potting, 2017), briefly called R-Strategies, which are also integral part of the Austrian Circular Economy Strategy (BMK, 2022b). The analysis of the database shows that about 20% of the fundings are exclusively dedicated to circular economy and 80% have a wider scope but accept a focus on circular economy aspects.

In summary, the Green Investment Report follows the circular economy related definitions of the EU Taxonomy (EC, 2025f), the Austrian budget plan (BMF, 2025a) defines a circular economy goal in alignment with the circular economy definition of the European Parliament (European Parliament, 2023) and the funding portal for circular economy defines its scope based on the R-Strategies (Potting, 2017). Overall, the circular economy definitions in relation to CE finance are in alignment with the Austrian Circular Economy Strategy (BMK, 2022b).

There are private and public investments to path the way towards a circular economy. The private investments are recorded by the Eurostat indicator on private investment and gross added value related to circular economy sectors. At the state level it is possible to find the data for public investments per each funding scheme, for example:

- Federal expenditures within the framework of the Environmental Recovery Act (BGBl. Nr. 185/1993, last revision by BGBl. I Nr. 26/2022, 2022) are documented in annual reports of the Kommunal Kredit Public Consulting (KPC, 2025). For instance, in 2024, EUR 41 m were available for projects in the areas of circular design and sustainable production as well as sorting, reusing and recycling of selected waste streams (BMLUK, 2025). In addition, EUR 254 m are available to foster the repair of electric and electronic products as well as bicycles (repair voucher), whereas EUR 130 m are sourced from the "NextGenerationEU" programme in the context of the Austrian Recovery and Resilience Plan and EUR 130 m have been added from the Austrian budget.
- The Federal Government financially supported applied research with a special focus on circular economy. In the period 2021-2023, there have been 3 calls with a total budget of EUR 36.5 m (BMK, 2024). The phase 2024-2026 has a total budget of EUR 95 m (Vogel, Johanna; Alaux, Nicolas; Hoff, Holger; Wallenko, Laura, 2025). This finances, inter alia the RTI program "Raw Materials 2024" which focuses on raw material supply from primary and secondary sources, e.g. research on the recovery of critical raw material from mining residues and research on public awareness of mining projects (FFG, 2024).
- At the level of provinces, the government of Steiermark funds projects on waste and resource management (BMF, 2025b) and there is also an annual waste prevention funding of the Extended Producer Responsibility (EPR) system (VKS, 2024).
- The Green Public Procurement Programme considers circular economy related criteria such as minimum recycling content in asphalt (BBG, 2025). However, the expenditures have not been assigned to circular economy categories up to now. This also applies for other measures such as the recycling of land with an investment volume of EUR 5.3 m (BMLUK, 2025). From an EU Taxonomy perspective, these measures contribute to multiple environmental objectives such as "climate change and mitigation" and "transition to circular economy".
- It is noted that some measures have an effect on CE finance but not cause significant investments, for example, an amendment to the EU state aid schemes (KUEBLL) for operating cost subsidies in favour of the material, circular use of renewable raw materials (BMK, 2022a).

Additional expenditures, such as those from public procurements and for the recycling of land cannot be exclusively allocated to circular economy because the measures also contribute to other objectives. In conclusion, the data on current investments are available but distributed among different data sources. A compilation of all current expenditures or investments is currently not available.

The identification of future investment needs is challenged by the fact that circular economy is a vague and broad concept. More than 100 CE definitions can be found in the literature (Kirchherr, Julian; Reike, Denise; Hekkert, Marko, 2017). The Austrian Circular Economy Strategy is based on the definition of circular economy according to the European Parliament (BMK, 2022b; European Parliament, 2023). Total costs for implementation of the measures listed in the Austrian Circular Economy Strategy have not been estimated so far, though some estimates on future investments are fragmentary available. For example, the recovery of phosphorus from sewage sludge is expected to cost about EUR 9 m per year (BMK, 2022c). The total costs for the remediation of brownfields are estimated to be at least EUR 5 bn (Umweltbundesamt, 2022). Next to the knowledge gap on future investment needs is the lack of a methodology to assess the effectiveness of the circular economy measures. The monitoring of the effectiveness of circular economy measures should be established according to the Circular Economy Strategy (BMK, 2024).

Box 4.1: Austria case study – highlights

- Circular economy policies: Three key circular economy policies in Austria provide for multiple measures for transitioning to circularity, including financing considerations.
- National budget: Austria exercises monitoring green (including circular) investments and expenses in the national budget process using the six environmental objectives of the EU Taxonomy through green budgeting analysis.
- Circular economy funding information: Austria makes information on circular economy funding opportunities in the country available centrally at a special funding portal for circular economy.
- Private finance sector: Sustainable finance strategy in Austria fosters engagement of financial institutions in sustainable transitioning, supporting also circular economy.
- Local and regional initiatives: Many institutions on federal, provincial, and local level provide financial subsidies for circular economy projects.
- Circular economy as a part of wider sustainability measures: A general trend is lack of funds or instruments dedicated solely to circular economy, not to wider sustainability measures.

4.3.2 Country case study: Germany

Figure 4.6: Germany CE country profile

GDP: EUR 4,122.2 billion (24.2 % of EU27 total in 2023)

GDP per person: EUR 48,780 (purchasing power standard) (114.8 % of EU27 (from 2020) total per person)

Use of materials (domestic material consumption (DMC))
1,143.3 million tonnes DMC (18.0 % of EU27 total in 2022)
13.6 tonnes DMC/person (95.9 % of EU27 average per person in 2022)

Structure of the economy (2023):
Agriculture: 0.8 %
Industry: 30.5 %
Services: 68.7 %

Employment in circular sectors:
785,297 people employed in CE sectors (18.3 % of EU total in 2021)
People employed expressed as a percentage of total employment: 1.7 % (compared to 2.1 % for EU average in 2021)

Surface area: 357,376 square kilometres (8.5 % of EU27 total)

Population: 83,115,000 (18.6 % of EU27 total in 2023)

Note: all definitions and metadata used in this profile are taken, as shown, from Eurostat

Source: Replicated from EEA circular economy country profiles (ETC CE, 2024b)

Circular economy in Germany

Germany's material footprint (raw material consumption) has decreased to slightly below the EU average in 2023. Germany shows steady improvement of their resource productivity, which is the 7th highest gross domestic product to domestic material consumption ratio in the EU in 2023: around EUR 3.1 per kg vs EUR 2.2 per kg EU average. The country's circular material use rate is higher than the EU average (13% in 2022 compared to the EU average of 11.5%). The German economy is service focused and has material import dependency of 37.5%, which is higher than the EU average of 22% (ETC CE, 2024b).

Germany used to be a frontrunner on circular economy financing (e.g. EPR schemes like the Green Dot - der Gruene Punkt). The circular material use rate has increased only incrementally and remains just above the EU average. But especially with regard to circular activities that go beyond improved waste management - like the extension of the use phase, circular production design, or upper R strategies - and related circular economy business models like sharing or leasing (the so-called "upper R-strategies" according to the circular economy classification (Potting, 2017)), different analyses have highlighted urgent necessities to valorise and scale up innovations that still come out of the German research system, but fail to succeed on the domestic or even international market.

A study on behalf of the German Environment Protection Agency (UBA) highlighted the need for more systemic innovations:

> *"The analysis comes to the conclusion that the transformation towards a circular economy in Germany is still in an early phase of development with little momentum. In order to overcome the identified weaknesses of the innovation system, the markets for secondary raw materials and entrepreneurial experimentation with circular business models and approaches to material flow management would have to be promoted"* (Gandenberger, 2021).

Very recently the German government itself published the so-called transformation report on circular economy (Bundesregierung, 2024). Also, this report highlights the current gap between environmental as well as socio-economic potentials of a circular economy in Germany and, on the other hand, the lack of a self-supporting dynamic and the mobilisation of especially private investments for circular business models. Recent studies showed that an ambitious implementation of policy instruments for a circular economy could lead to a reduction of 26% of GHG emissions and 27% of resource consumption until 2045, while at the same time increasing the German GDP by 14% (Prakash et al., 2023). As a key challenge in order to exploit these potentials, the German government highlighted the need for a more integrated governance approach as well as financial incentives for private investments.

Against this background, the German government launched its **National Circular Economy Strategy** in December 2024 that aims to provide a strategic framework for a variety of different and often uncoordinated strategies like the German resource efficiency programme, the German waste prevention programme or the raw material strategy. The often unclear governance structure of responsibilities for circular economy topics has often been indicated as a key challenge for an accelerated transformation towards circularity (Hummler et al., 2023).

With regard to the specific challenge of financing increased circularity, Germany had launched the so-called "**Climate and Transformation fund**" with significant amounts of money that was supposed to be invested also in circularity topics. In 2023, however, the German Federal Constitutional Court declared this fund to be incompatible with the German finance constitution (Bundesverfassungsgericht, 2023), as it covered unused funds from emergency funding established during the Covid pandemic. This led to a gap of EUR 60 billion for various climate and transformation-related topics. As a consequence, the German government broke down, currently leading to a situation without a valid budget for the fiscal year 2025 or 2026. This causes tremendous problems also with regard to public finance policies for a circular economy.

Assessment of Investment Gap

Until the end of December 2024, Germany did not have a specific circular economy strategy but rather a variety of programmes, action plans, and strategies that addressed aspects of circularity. Against this background, a common understanding of circular economy – often limited to better waste management – and thus a clear assessment of necessary financing has been missing.

However, the discourse on necessary financing has gained attention, given that public investments, public procurement, etc., will not be sufficient for the transformation to a circular economy. The German government set up an **advisory council and a national strategy on sustainable finance** that also highlighted the importance of circular economy (Bundesregierung, 2021), but without clear metrics or data.

At the federal level, research funding has so far received most attention, while instruments that channel public and private funds and support scaling of circular resources, products, and business models remain underdeveloped. More consistent coordination of existing instruments would be beneficial, particularly in relation to their alignment with socio-political compensatory measures.

There are fundamental uncertainties about the scale and nature of required investments, alongside a lack of transparency, risk management, and reporting. Many European regulations still need to be

transposed into national law in Germany, which creates legal grey areas and uncertainty that increase perceived risk. As a consequence, circular finance is often not offered at reasonable premiums and demand remains limited. Some subsidies further hinder circular business models, for example tax exemptions for the production of primary plastic (Umweltbundesamt DE, 2021), or car purchase subsidies that discourage expansion of sharing models.

In the banking sector, institutions are frequently reluctant to support long-term projects or investments in critical raw material recovery projects. The same applies to recycling processes and facilities, particularly innovative ones. Many government-funded R&D projects have failed to scale to an industrial level. Evaluation methods for circular business models remain underdeveloped. The federal strategy (Bundesumweltministeriums, 2024) explicitly calls for evaluation and rating tools for mid-size investments (EUR 0.5–10 million), which are too small for institutional investors but vital for SMEs.

A persistent problem is that recycled raw materials (e.g. lithium, rare earths) are often still more expensive than primary ones, making recycling economically unattractive. The limited creditworthiness of circular projects and the inferior performance of some circular products versus linear ones underline the need for venture capital to implement the strategy effectively.

Policies and measures to address the financing gap

The German government has acknowledged that current investments are insufficient to maintain or grow Germany's position in the global circular economy. Several initiatives have therefore been launched to support private and public investment in circular infrastructure, processes, and business models.

The German Circular Economy Strategy (Bundesumweltministeriums, 2024) includes a dedicated chapter on market-based instruments and finance. A key initiative is the **EUR 1 billion Raw Materials Fund**, coordinated by the Ministry of Economics and implemented by KfW (German development bank). It supports innovative, sustainable raw material projects (extraction, processing, recycling), domestically and abroad. Investments range between EUR 50 and EUR 150 million. This equity-based fund allows federal indirect participation and aims to crowd in private capital and improve project creditworthiness.

Another strategic pillar is the **creation of green lead markets**, e.g. mandatory recycled content quotas at the EU level. A **certificate trading system** is under evaluation to reward companies exceeding quotas, ensuring clear anti-greenwashing rules.

Development banks are tasked with strengthening access to finance. KfW and state-level institutions are expected to act as innovation and co-venture capital providers, supporting circular economy strategies. This includes regionally specific instruments and expands roles across financing, advisory, and awareness services.

Further proposed instruments include:

- **Transformation guarantees** to address collateral gaps for SME loans, potentially lowering capital reserve requirements for lenders.

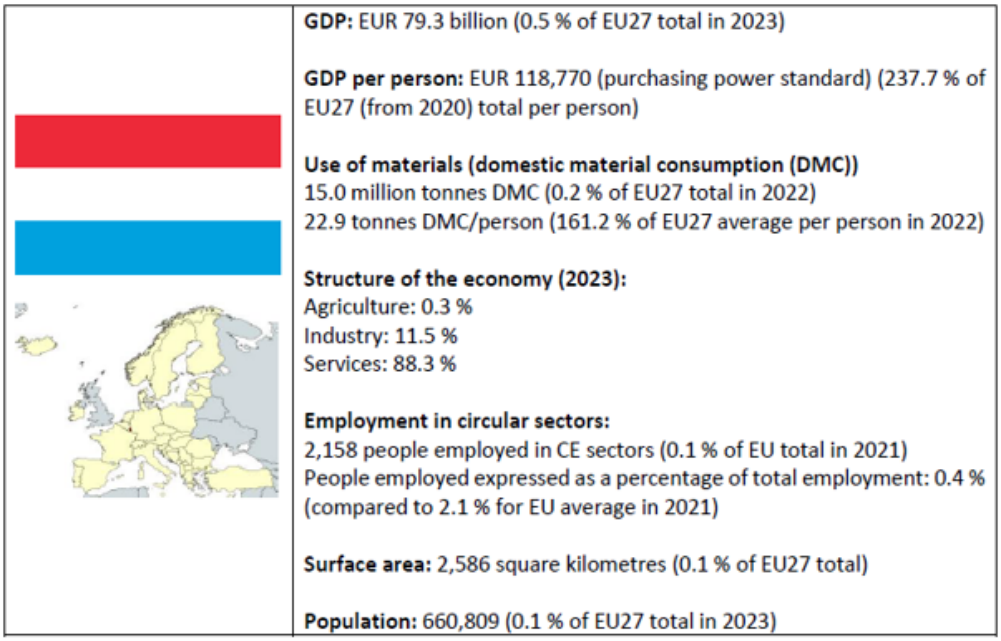
- **Circularity premiums**: consumer-side subsidies for durable or repairable goods, especially targeting low-income households.
- **Futures on circularity rights**: financial instruments securing future access to recyclable materials in long-life systems like EV batteries or wind turbines, incentivising design for circularity.

Box 4.2: Germany case study - highlights

- National policies: The recently launched National Circular Economy Strategy explicitly recognises the need for more circular finance and proposed a long list of potentially promising instruments and measures, which is expected to play an important enabling role.
- National budget: Delays or uncertainties related to the national budget create doubts about the implementation of newly adopted policies, including the National Circular Economy Strategy.
- Interministerial coordination: A key learning already from the development process of the strategy has been the importance of a coordinated exchange between the ministries responsible for the topic and those responsible for financing. This has been identified as a key weakness over the last years, also considering different political priorities of the responsible parties during the last German government.
- State development banks: The Raw Material Fund is co-managed by the KfW. Germany seems to be a good example of a country that introduces initiatives through state-owned development bank to direct investments into circular economy projects in private sector, recognizing that earlier the focus has been mostly on public expenditures for waste management infrastructures and research programmes.
- Sustainable finance strategy: The sustainable finance strategy at the national level highlights circular economy investment needs, although lacking clear metrics and assessments.
- Regional and local bottom-up initiatives: Right now, it seems that concrete measures have been taken rather on the level of the federal states, e.g. in the form of specific financing programmes for circular cities in North Rhine Westphalia.

4.3.3 Country case study: Grand Duchy of Luxembourg

Figure 4.7: Luxembourg CE country profile



Note: all definitions and metadata used in this profile are taken, as shown, from Eurostat
Source: Replicated from EEA circular economy country profiles (ETC CE, 2024c)

Circular economy in Luxembourg

Luxembourg has third largest material footprint (raw material consumption) in the EU, which increased from 2019 to 2023 to around 33t per person, more than twice as much as the EU average of 14.1t per person. At the same time, Luxembourg has the second highest resource productivity, which in 2023 accounts to almost doubled rate comparatively to the EU average: around EUR 4.5 per kg vs EUR 2.2 per kg respectively. The country's circular material use rate is lower than the EU average (5.2% in 2022 compared to the EU average of 11.5%). Such a low circular material use rate might be impacted by the structure of the economy, focused on service by 88.3%. Luxembourg has material import dependency of 88.7%, much higher than the EU average of 22% (ETC CE, 2024c).

Financial leadership and circular economy strategy

The Grand Duchy of Luxembourg has long positioned itself as a frontrunner in fintech and cross-border investment. Since the 1980s, it has become Europe's leading hub for international investment funds. Notably, PayPal obtained its European banking license in Luxembourg in 2007 (Luxembourg for Finance, 2022, p. 8). The country's favourable regulatory environment - such as cloud-friendly legislation and legal frameworks for electronic archiving (Luxembourg for Finance, 2022, p. 4) - continues to attract fintech innovation.

Luxembourg's financial regulators have built a strong reputation for authorising and supervising financial institutions, offering fintech firms a robust base for EU-wide operations (reference). The

circular economy has been identified as a key driver of future economic diversification and value creation, including within the Greater Region [9](ETC CE, 2024c).

Reflecting this, Luxembourg adopted a national circular economy strategy in February 2021 (Schosseler et al., 2021). The strategy aims to take the circular transition to the next level, identifying proven regulatory, financial, and information management tools for uptake across key sectors. It envisions, for instance, that "*the national tax system will support companies implementing a circular approach*" (Schosseler et al., 2021). The strategy serves as a toolbox for public authorities, covering six domains: construction; education and training; finance; food and biomaterials; industry; and retail.

A co-creation approach informed the strategy's development, actively involving public and private stakeholders. A key feature is the establishment of a national coordination and information platform, with the Ministry of Finance as a permanent member of the CE coordination unit (Schosseler et al., 2021).

Assessment of the circular economy investment gap

Luxembourg's strong position as a global centre for sustainable and green investment places its financial community in a pivotal role for circular economy financing (ETC CE, 2024c). However, this role presupposes a deeper understanding of circularity and its financial implications. The national circular economy strategy explicitly identifies a gap in sector-specific expertise among financial actors as a central barrier to unlocking circular finance.

Policies and measures addressing the circular economy financing gap

Unlike most European circular economy strategies, Luxembourg's national circular economy strategy contains a dedicated and detailed chapter on the role of finance. Its rationale is to ensure the financial sector can support firms transitioning to circular business models. For example, product-as-a-service models require upfront material investment, which often creates financing barriers without dedicated instruments.

To address this, Luxembourg developed a Sustainable Finance Roadmap in 2018. Based on this, the **Luxembourg Sustainable Finance Initiative (LSFI)** was launched in 2021 to coordinate and implement the roadmap, including its links to the circular economy (The Government of the Grand Duchy of Luxembourg, 2024). The Ministries of Economy and Finance have also announced a study to identify priority areas for supporting circular business models, including in the finance domain.

The strategy sets the explicit goal of making Luxembourg's financial sector an early adopter of circular principles, leveraging its international finance and fund ecosystem. Key instruments include:

- **Luxembourg Green Exchange** and **LuxFLAG**: Labelling initiatives designed to raise awareness and signal confidence in circular and sustainable finance to the broader financial ecosystem.
- **Fit 4 Circularity**: A programme that helps companies assess their circular potential and identify value chain opportunities in co-creation. Financial sector alignment is built into its design.

[9] The "Greater Region" is a cross-border cooperation region with more than 11.8 million inhabitants from the territories Lorraine in the French region Grand Est, Wallonia, the Federation Wallonia-Brussels and Ostbelgien in Belgium, Saarland and Rhineland-Palatinate in Germany as well as the Grand Duchy of Luxembourg, see https://www.granderegion.net/en/The-Greater-Region-at-a-Glance

- **Circular economy investment subsidies**: Provide a 20% bonus on eligible costs if investments contribute to CE transitions.
- **Reduced VAT rate**: Applied to a range of circular services, such as bicycle repair (Schosseler et al., 2021).

Criteria for circular investments and monitoring responsibilities rest with the inter-ministerial circular economy coordination unit.

Box 4.3: Luxembourg case study – highlights

- Unique positioning as a circular economy finance hotspot, supported by both public and private initiatives. The financial sector's involvement spans venture capital for start-ups, private equity for circular economy-driven SMEs, and insurance and banking products tailored to circularity. The country has also exported circular support services, such as accounting, insurance, taxation, auditing, consultancy, and secure data management, at both European and global levels (ETC CE, 2024c).
- Policy coordination. One key success factor is the structural integration of the Ministry of Finance in both the strategy design and implementation phases. Luxembourg's unique focus on combining its fintech leadership with regional circularity initiatives is widely seen as exemplary (ETC CE, 2024c). Experience from green and sustainable finance has shown that sector-specific incentives (e.g. taxes or grants) are insufficient unless integrated into broader, cross-sector frameworks. In Luxembourg, these incentives have been carefully developed with the Ministry of Finance to ensure that circular economy-related finance is embedded within national demonstration projects and horizontal enablers. This avoids duplication or fragmentation of policy initiatives - an issue that often arises when circular economy and financial policies are developed in parallel but without coordination.
- Digital innovation. Stakeholders also emphasise the importance of combining digital innovation with appropriate financing and tax models. The circular economy strategy has therefore been tightly aligned with Luxembourg's **Data-Driven Innovation Strategy**, which explicitly includes circularity as a strategic focus (Gritz et al., 2019). This combination of a high-performing ICT sector and a well-developed financial system makes Luxembourg a promising testbed for emerging circular economy business models.
- Data availability. Luxembourg's small scale and statistical confidentiality (e.g. on circular economy employment) make direct comparison with other EU Member States difficult.

4.3.4 Country case study: the Netherlands

Figure 4.8: Netherlands CE country profile

GDP: EUR 1,067.6 billion (6.3 % of EU27 total in 2023)

GDP per person: EUR 59,710 (purchasing power standard) (133.7 % of EU27 (from 2020) total per person)

Use of materials (domestic material consumption (DMC))
176.7 million tonnes DMC (2.8 % of EU27 total in 2022)
9.9 tonnes DMC/person (70.2 % of EU27 average per person in 2022)

Structure of the economy (2023):
Agriculture: 1.9 %
Industry: 20.8 %
Services: 77.3 %

Employment in circular sectors:
105,173 people employed in CE sectors (2.5 % of EU total in 2021)
People employed expressed as a percentage of total employment: 1.1 % (compared to 2.1 % for EU average in 2021)

Surface area: 41,540 square kilometres (1.0 % of EU27 total)

Population: 17,811,291 (4.0 % of EU27 total in 2023)

Note: all definitions and metadata used in this profile are taken, as shown, from Eurostat
Source: Replicated from EEA circular economy country profiles (ETC CE, 2024d)

Circular economy in the Netherlands

The Netherlands has the lowest material footprint (raw material consumption) in the EU, which decreased gradually since 2010 and reached 9.9t per person in 2023 comparatively to the EU average of 14.1t per person. At the same time, the Netherlands shows steady improvement of its resource productivity, achieving the highest gross domestic product to domestic material consumption ratio in the EU in 2023: EUR 5.5 per kg vs EUR 2.2 per kg EU average. The country has the highest circular material use rate in the EU (27.5% in 2022 compared to the EU average of 11.5%). Undisputably, the Netherlands is the leader in the circular transition in the EU (ETC CE, 2024d). The structure of the Dutch economy is service focused and has material import dependency of 82.7%, much higher than the EU average of 22%.

Policies on circular economy

The Netherlands has stated its ambition to be circular by 2050 in the program that was adopted in 2016 under the name of **A Circular Economy in the Netherlands by 2050**. To achieve this ambition, the program elaborates on the interventions necessary in five areas: fostering legislation and regulations; intelligent market incentives; financing; knowledge and innovation; and international cooperation (the Ministry of Infrastructure and Environment of the Netherlands et al., 2016). The Dutch environmental agency publishes a biannual report - **Integral Circular Economy Report (ICER)** - on the progress achieved by the state in the circular transition. The most recent ICER is published July 2025. The Netherlands has adopted the **National Circular Economy Program 2023-2030 (NPCE)** in 2023, which lists some financial measures to achieve the circularity goal (subsidies, EPR, taxes) and refers to the Circular Economy Working Group of the Sustainable Finance Platform, set up by the government and financial institutions. The program is subject to an update every two years, the next of which is coming in September this year, and to biannual report on implementation of the 300 measures included in the NPCE. Besides the three major strategic documents, the Netherlands has

included circular economy elements in other policies, e.g. on construction, biomass and food, and waste management (ETC CE, 2024d).

Circular economy finance

The key circular economy policies mentioned above include the following finance considerations:

- **A Circular Economy in the Netherlands by 2050** (the Ministry of Infrastructure and Environment of the Netherlands et al., 2016) acknowledges the following barriers for circular economy finance: higher capital requirements and lack of knowledge and experience. The program proposes to support private sector initiatives through exploring the establishment of an **Energy Transition Financing Facility**, available also for circular economy projects. Support to entrepreneurs with developing revenue models is provided through **Nederland Circulair! Programme**, which helps inter alia with financing advisory. Providing technical support in development of revenue models and utilisation of financial instruments as well as inviting financial institutions to elaborate on assessment of new circular business models are among other measures considered by the Dutch government. With regards to private finance, the program recognises the initiative of three large Dutch banks (ABN-Amro, Rabobank, and ING) that have issued a joint statement on circular economy importance. The government has remained in a continued dialogue with financial institutions (see also Box 2 in Chapter 3). European co-financing (EU funding programmes) and existing initiatives like the local expertise center on sustainable financing and the Dutch Association of Investors for Sustainable Development (VBDO) are mentioned as well. Recognising the added value of the sharing economy, the program suggests considering favorable tax environment for respective business models.
- **NPCE 2023** (the Ministry of Infrastructure and Water Management of the Netherlands, 2023) refers to the **Roadmap for Circular Finance for 2030** (Platform voor Duurzame Financiering, 2022), developed by the Circular Economy Working Group of the Sustainable Finance Platform, stating the ambition "*By 2030, circularity should be an integral part of how financing applications are assessed and directly inform investment decisions*." The Roadmap elaborates the key four actions to achieve the ambition: assessing circular risks, developing circular metrics, best practice and experience sharing through landmark deals, and optimising financing instruments. NPCE 2023 summarises six measures to stimulate circular economy financing, among others, supporting the implementation of the Roadmap and aiming for the EU taxonomy. In the budget of the Ministry of Infrastructure and Water Management the total budget allocated to circular economy measures in 2023-2030 amounts of EUR 454 m, requiring in average EUR 57 m per annum – with larger annual investment need in the first five years (up to EUR 69 m) and a decreased amount (EUR 48 m) in the last years (the Ministry of Infrastructure and Water Management of the Netherlands, 2023). Budgets of other ministries - the Ministry of the Interior and Kingdom Relations, the Ministry of Economic Affairs and Climate, and the Ministry of Agriculture, Nature and Food Quality – presumably might also include some amounts dedicated to circular economy measures.
- **ICER 2025** (Hanemaaijer et al., 2025) recognises underdevelopment on the circular economy transition path and among its four recommendations to policy makers suggests to work on the subsidies and taxes, to eliminate the price difference between recycled and primary material resources. ICER 2025 emphasises the importance of implementation of the NPCE 2023, noting, however, insufficiency of resources for the circular economy in the Dutch national budget. The funds allocated for circular economy transition in the budget of the Ministry of Infrastructure and Water Management are not enough and are expected to decrease after 2026, requiring mobilisation of financing from other sources. ICER 2025 notes recent increase in resources available for subsidising research and innovation in recycling as well as climate funds available for the circular economy. However, currently only a few

financial schemes have specific circular economy focus. Financing from existing climate funds is hardly possible for circular supply chain and extending lifespan projects, as well as for projects creating circular impact outside the country.

The NPCE 2023 mentions multiple government initiatives, financially supporting circular economy development in the Netherlands:

- **Netherlands Enterprise Agency (RVO**) (RVO, 2025a): the government agency, a part of the Dutch Ministry of Economic Affairs, provides support with investing and developing business locally and internationally. Circular economy is not a separate topic of the RVO, but covered under others (climate change, international business, etc). One example of circular economy support implemented by the RVO is the subsidy for circular value-chain projects. The RVO summarises the calls for EU funding programmes at its subsidy and funding guide page. The RVO approves tax credits for R&D activities (WBSO tax credit, 5% of which goes to the circular economy). According to ICER 2025 (Hanemaaijer et al., 2025), through the RVO EUR 440 m was directed to support circular economy business through subsidies (68%) and tax (32%) schemes. The support grows from 7% in 2018 to 9% in 2020 and 14% in 2022.
- **Invest-NL** (Invest-NL, 2025): the financing and development institution, founded in 2019 and owned by the Dutch Ministry of Finance, has a mission of financing the innovating and sustainable projects to transition the Netherlands to 2050. One of the five themes covered by Invest-NL is biobased and circular economy. As an implementing partner of InvestEU programme, Invest-NL helps Dutch companies to attract European funding. Additionally, Invest-NL manages **DACI (Dutch Alternative Credit Instrument),** the **Deep Tech Fund** and the **Dutch Future Fund (DFF)**, mobilising capital for start-up and scale-up financing. It also employs blended finance and guarantee schemes.
- **MIA/Vamil** tax schemes for environmentally friendly investments support also circular economy investments (31% of MIA/Vamil went to the circular economy according to ICER 2025). Such tax schemes allow to deduct 27%, 36%, 45% or 75% of the investment costs from the taxable profit of the companies (RVO, 2025c).
- The **National Growth Fund**, the initiative of the Ministry of Economic Affairs and the Ministry of Finance, provides funding for knowledge, R&D and innovation projects, inter alia, in circular economy area (The Government of the Netherlands, 2025).
- **Green Projects Scheme** (RVO, 2025b) by the Dutch government facilitates obtaining a discounted interest rate borrowing that an eligible project for circular economy, environmental technology, durable or innovative solutions, as confirmed by the green declaration, can get from a commercial bank. Circular economy is one of the seven eligible project categories.
- **Holland Circular Hotspot** (Holland Circular Hotspot, 2025) is a private foundation aiming at accelerating circularity transitioning, including activities on facilitating access to financing instruments and programmes.
- The government continues to improve instruments like subsidies for circular business, to make them more easily accessible as recommended in the Circular Finance report published in 2023 by the Ministry of Infrastructure and Water Management (The Government of the Netherlands, 2023). The report analyses circular finance possibilities available for SMEs in the Netherlands. To direct private savings towards sustainability, the government develops attractive green savings and investment schemes, e.g. through specific tax considerations.

Dutch financial institutions are frontrunners in considerations circular economy finance, also in close cooperation with the Dutch government:

- The initial circular economy finance guidelines have been developed by Dutch banks (ABN Amro, Rabobank, and ING), together with the EBRD in 2018 (see Section 3.3.1).

- As a part of the Sustainable Finance platform, managed by the Dutch National Bank (DNB), The Circular Economy Working Group was set up in 2021, consisting of Dutch commercial banks, the Ministry of Infrastructure and Water Management and two local governments, and the EIB. The Working Group has already published the roadmap to a circular economy in 2030 in 2022 and developed a circular risk scorecard in 2024, testing it on 100 companies (DNB, 2021; Circular Economy Working Group, 2024). See also Box 2 for more details.
- The government and the Dutch Banking Association have signed a joint statement on cooperation towards a circular economy in 2024. Acknowledging insufficient finance for an investment in the circular economy in the country, the government and the banking sector have agreed on the fields of actions to push circular economy (The Government of the Netherlands, 2024).
- In 2025 the DNB published a study on possible geopolitical risks impacting financial institutions. The study considers also the critical raw material risks, which is a part of the circular economy (DNB, 2025).

Box 4.4: Netherlands case study – highlights

- Circular economy strategic goal: the Netherlands has a goal to become circular by 2050.
- National strategies: the Netherlands shows not only an ambitious strategy for the circular economy but also develops numerous ways for reaching this ambition. This is done also through introducing numerous government initiatives.
- Circular economy as a part of wider sustainability measures: Mostly government initiatives support various sustainability measures, not being solely dedicated to circular economy. Purely circular economy dedicated funds or financing instruments are lacking.
- Sustainable finance: With its sustainable finance platform, managed by the national bank, and its circular economy working group, the Netherlands stands out as the example of proper coordination between the government and finance sector. The Joint Statement on cooperation towards a circular economy outlines the roles of government and finance (Government of the Netherlands, 2024). The Dutch government supports and endorses the initiatives of finance industry.
- Private finance sector proactivity: The first circular economy guidelines have been developed by a working group that included three Dutch commercial banks in 2018 (ING et al., 2018). As a part of the working group on circular economy, Dutch banks continue to contribute in development of practical guidelines, like circular risk scorecard (Circular Economy Working Group, 2024; Kopgroep Circulair Financieren, 2024).
- Wider engagement for implementation of circular strategy: Apart from the government and finance sector, academics also engage with their contribution, for example, as a study published by the Sustainable Finance Lab on possibilities of investing in circular private funds by pension funds (Sustainable Finance Lab, 2023).
- Circular finance assessment: At the same time, neither clear estimation of up-to-date investments into the circular economy, nor investment gap assessment is found in the materials and sources reviewed.

Having analysed the four Members States with the private investment indicator outperforming the EU average, this indicator alone does not represent the overall advancement of the circular economy. Except for the Netherlands, other states' circular economy metrics, included in the EEA country profiles, show both better and worse results than the EU average. The common finding is the need for

the inclusion of finance considerations in the national circular economy policies. However, assessment of current and needed investments is fragmented in all countries reviewed – the comprehensive clear picture is missing. This is explained by the absence of a standardised approach or methodology.

4.4 Cumulative review of the analysis and discussions with concluding recommendations

Box 4.5 Chapter 4 Key Insights:

1. Current estimates of circular economy investments show increased amounts, at the same time also increased gaps which require significant additional financing.
2. Assessment of circular economy investment requires access to multiple data sources, with expectations of availability of improved data in the coming years, particularly in the finance sector. Public finance contributions' estimations are still fragmented.
3. Although the most recent circular economy investment assessment methodologies differ in scopes and results, they use the similar data sources and explore a common idea of using NACE codes as the circular economy spreads across the economy.
4. The EU CEMF private investment indicator does not necessarily correlate with the progress on circular transitioning in Member States; besides, the practical application of this indicator is not obvious.
5. The country case studies explored reveal differences and commonalities of circular economy finance developments, e.g. importance of circular economy policies, national budget, interministerial and finance sector coordination, sustainable finance strategy, roles of development and commercial banks, and lack of purely circular economy dedicated funds and instruments.

- **Investment needs remain significantly unmet despite progress in estimates and frameworks.** Despite improvements in monitoring methodologies (e.g., EIB-EC, PSF, EU CEMF), the annual EU-level investment gap for the circular economy remains EUR 82 billion (EIB-EC, 2026). Improved assessment methodologies lead to larger estimates of the gap. The gap is most severe in upstream and high-impact areas such as sustainable product design - strategies critical to systemic change but poorly represented in financial allocations. This is echoed by empirical research reporting that infrastructure-heavy models continue to dominate funding streams, marginalising early-stage or service-based innovations (de la Cuesta-González and and Morales-García, 2022).
- **Definitional inconsistencies undermine comparability and policy targeting.** Diverging classification systems (e.g. EU Taxonomy, CEAP-linked NACE lists, and CEMF indicators) result in a lack of alignment across funding estimates and monitoring frameworks. Fang et al. (Fang et al., 2024) highlight that the absence of standardised labelling and circular economy fund categorisation hampers investor visibility and data aggregation. These methodological limitations prevent the establishment of reliable benchmarks and obstruct strategic policy targeting. At the same time, the conducted research points on the data used in several approaches or frameworks, e.g. NACE classification.
- **Public and private funding contributions**. The circular economy investments in the EU are predominantly carried out by private entities and mostly financed through private capital: representing around 93% of total investment (EIB-EC, 2026). However, such estimates are done based on corporate reporting of capital investments (statistical data), complemented by EU funding data, without a possibility to comprehensively track the origin of funds. Assessment of public funding, concerning EU funds, into circular economy is feasible, while the complete mapping of Member States' public financing into circular economy (including all national allocations) is less accessible as the country case studies show. Yet, programmes such

as the Recovery and Resilience Facility (RRF) have been instrumental in covering systemic gaps and supporting underfunded sectors. The studies show a mismatch of current circular economy investments into key value chains and investment gaps in respective key value chains. Kumar et al. (2024) caution that existing structures already fail to adequately serve micro- and small enterprises, pointing to the need for targeted financial inclusion strategies. However, new opportunities may emerge for circular economy funding in the post-2027 MFF, e.g. through building on the links of circular investments to the decarbonisation and competitiveness measures, in particular if in the MFF negotiations it is managed to uphold the proposed 35% green spending target across the MFF.

- **Sectoral and regional imbalances point to equity and efficiency concerns.** PSF and EU CEMF data show that circular economy investment, in absolute terms, is concentrated in western and northern Member States. Luxembourg's experience illustrates how strategic coordination and cross-ministerial integration can overcome structural finance barriers. In contrast, Central and Eastern European countries are lagging in circular economy transition planning (PSF, 2025b). Such imbalances are also influenced by availability of data: not many companies or financial institutions in Central and Eastern Europe are eligible to mandatory reporting.
- **Structural blind spots in financial market instruments remain unresolved**. PSF's analysis of loans, bonds, and equity reveals that financial instruments are sometimes poorly aligned with circular economy activities. Private equity data are especially underreported. Fang et al. (2024) stress that current mutual and exchange-traded funds fail to classify circular economy investments consistently, reducing performance transparency and impeding capital mobilisation. Also, some reporting data (e.g. to ECB) is strictly confidential, and this is not of use for investors.
- **Institutional readiness varies sharply across Member States.** Case studies (Austria, Germany, Luxembourg, Netherlands) demonstrate that policy coherence and institutional capacity strongly affect circular economy finance mobilisation. In Germany, fragmented governance and delayed regulatory transposition have deterred investment (Gandenberger, 2021). Conversely, Luxembourg's inter-ministerial CE finance approach leads to more promising outcomes. In the Netherlands, the focus on becoming circular by 2050 fosters cooperation and efficient initiatives in both public and private sectors (specifically, in the finance sector). Austria considers circular economy in the national green budgeting process. The approaches also differ depending on the economy structure. Assessment of investments and future needs by country is fragmented.
- **Funding priorities remain skewed towards established and monitorable activities.** Waste management and recycling dominate current circular economy financing, partly due to clear asset tangibility and established business models. However, design, reuse, and repair remain underfunded. Ghisetti and Montresor (2020) note that these upstream strategies often require funding structures with higher risk tolerance and greater flexibility, which are currently scarce.
- **Monitoring frameworks must evolve to support strategic decision-making.** The EU CEMF indicator on private CE investment (0.8% of GDP) provides an aggregate snapshot but lacks granularity. Toxopeus et al. (2021) argue that monitoring should capture credit rejections, disaggregated financing flows, and the interplay between bankability and business model features. Moneva et al. (2023) highlight that without clearer circular economy metrics, guidance, and labelling, financial institutions are unlikely to prioritise circular economy assets in capital allocation. Emerging predictive tools for asset valuation (Fallahi et al., 2023) could further refine risk assessments and improve the integration of circular economy and into financial decision-making.

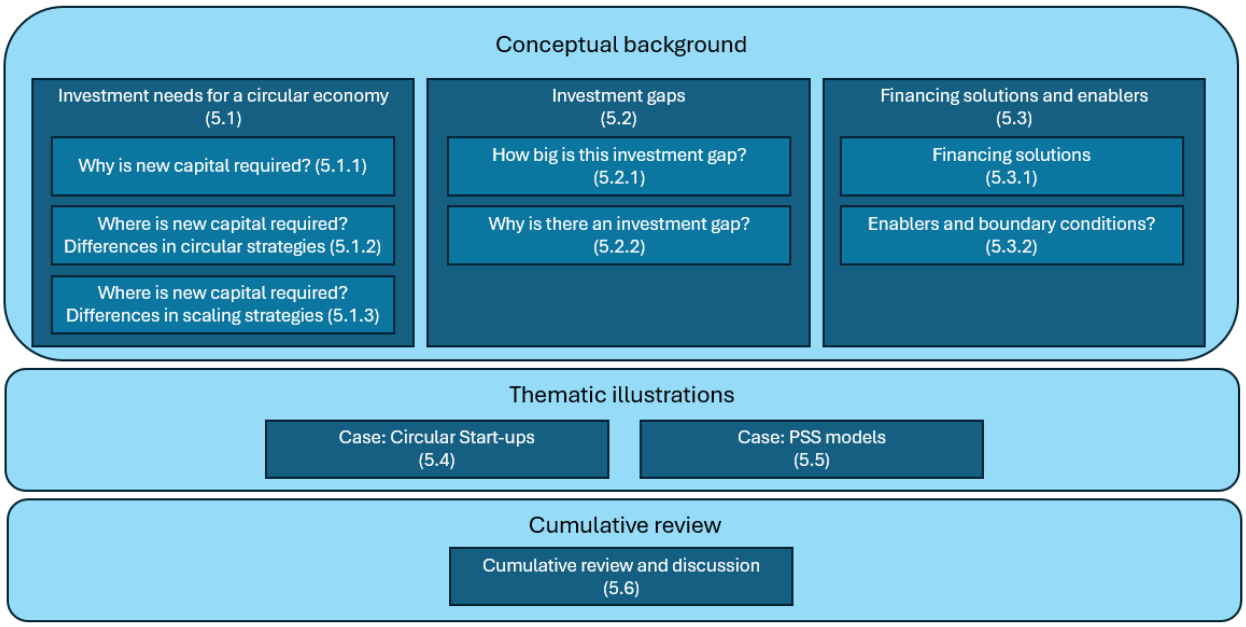
- **Improved monitoring frameworks may enable enhanced support to circular design**. Prerequisites for tapping more into the potential of circular design and directing additional funding towards these activities include improvements in the monitoring framework (1) to more precisely identify different circular economy activities (see also Section 3.2.3 on EU Taxonomy and Section 6.4 on indicators for the Circularity Metrics Lab), and (2) to more accurately capture the impact of circular economy funding. Advancements in these areas would provide the managers of EU funding programs with the data and tools to provide targeted financial injections into innovative solutions in addition to the advancement of the broader EU waste management system. Both pathways towards a circular economy should be expanded in parallel and their synergies further explored.
- **EU policy development and the future MFF needs to accommodate changes of the political-economic landscape and exploit new opportunities.** It is of great importance for the EU to position a circular economy in the centre of a joint roadmap for decarbonisation and competitiveness in the EU.

5 Identifying future and additional investment needs

Achieving the circular economy objectives of the European Union will require not only higher investment volumes but also a fundamental reorientation of how capital is allocated across different stages of the value chain. This chapter therefore examines both the scale and the structure of future and additional investment needs. It distinguishes between (1) why new capital will be required – driven by regulation, corporate action, technological innovation, and social change – and (2) where this capital will be needed across circular strategies (from after-use to before-use and sufficiency models) and scaling pathways (scaling out, up, and deep).

As illustrated in Figure 5.1, the analysis proceeds from mapping investment needs (Section 5.1) to identifying existing investment gaps and their systemic causes (Section 5.2), before exploring innovative financing instruments and enabling conditions that could mobilise capital more effectively (Section 5.3). Two thematic case studies follow – on circular start-ups and product-as-a-service (PSS) models – which illustrate how distinct types of ventures experience these financial challenges in practice and point towards targeted policy solutions. Together, these sections build a comprehensive picture of how public and private finance can be steered to support a circular transition.

Figure 5.1: Structure of this section



Source: created by VITO.

5.1 Investment needs for a circular economy

The transition to a circular economy demands a significant reallocation of capital, with investment needs varying across circular strategies, value chains, and business models. Despite growing policy and financial engagement, mismatches persist (Dewick et al., 2020). This section maps the drivers and patterns of circular investment needs, the diversity of financial demands across circular strategies along the value chain, and the imperative to tailor financial instruments to the specific challenges and opportunities associated with scaling circular solutions.

5.1.1 Why is new capital required?

Future investment needs in the circular economy stem from converging forces across regulatory frameworks, corporate commitments, technological innovations, and bottom-up societal and market shifts. Together, these drivers redefine capital demand across sectors and business models.

Regulatory efforts at EU and international levels continue to shape the strategic context for circular finance. Frameworks such as the EU Taxonomy and the CEAP aim to redefine investor behaviour by clarifying what qualifies as circular and sustainable activities, while increasing pressure on firms to disclose relevant performance metrics (Moneva et al., 2023; Rataj et al., 2025; Sepetis, 2022). More recent initiatives, such as the Clean Industrial Deal and the Competitiveness Compass, further signal a policy push towards circularity, albeit with a more specific focus on industrial sectors and recycling activities. These policies also acknowledge the complementary role of cities and regions as key enablers of circularity, particularly in driving circular consumption. However, persistent gaps remain between ambition and financial practice. At the firm level, many circular start-ups and SMEs face limited access to tailored finance, especially where regulatory uncertainty or market immaturity undermines bankability (de la Cuesta-González and and Morales-García, 2022). At the regional and local level, fiscal and institutional constraints hamper structural support. According to the OECD (2025), only 47% of EU cities and regions report having dedicated budgets for circular economy initiatives. Local authorities are often confined to ad hoc, project-based funding or temporary exemptions, while private investors continue to perceive urban circular initiatives as high-risk, due to complex value chain dynamics and the competitive disadvantage of circular models relative to linear ones.

Corporate efforts show how firms reorient business models to align with circular and ESG-linked expectations - not only for regulatory compliance, but also to secure capital and maintain credibility in financial markets (Moneva et al., 2023). Corporate circular economy strategies have demonstrated economic relevance, with stock markets positively valuing circular economy engagement and creditors penalising poor circular economy performance more systematically since 2015 (Palea et al., 2023)[10]. Circular ventures are expected to present more than environmental narratives alone. Demonstrable market traction, contractual proof points, and protectable innovations have become essential for attracting investment (Mejia et al., 2026). Among SMEs, a growing uptake of circular economy practices illustrates its diffusion beyond large firms. Ghisetti and Montresor (2020) note that many SMEs increasingly recognise the benefits of incorporating circular economy practices – such as sharing production facilities or improving repair and maintenance – even when they do not explicitly adopt circular business models. This reflects a growing recognition of reputational and strategic advantages in meeting ESG expectations. Meanwhile, an institutional shift is unfolding within the financial sector itself. Although gradual, this transformation entails reputational, strategic, and cultural drivers (Rataj et al., 2025), supported by rising stakeholder scrutiny and integrated sustainability disclosure requirements (Moneva et al., 2023; Sepetis, 2022).

[10] Palea et al. (2023) base their estimates on a longitudinal panel of 1,047 listed companies in mining, manufacturing, utilities, and construction sectors worldwide, observed over 2010–2019. They construct a circular economy (CE) score from eight environmental indicators in Refinitiv DataStream (e.g., eco-design, take-back and recycling, waste reduction, renewable energy use, and efficiency policies). Using percentile rank scoring, they assign firm-level CE scores (0–1 scale) annually and estimate multivariate regression models linking these scores to accounting-based profitability ratios (ROA, ROE, ROIC), operational efficiency (ROS, asset turnover), cost of debt, and market valuation (Tobin's Q). This methodology allows them to test whether higher CE performance translates into improved profitability and capital efficiency, lower debt costs, and higher equity market valuations, while capturing shifts before and after the 2015 Paris Agreement.

Technology is another driver for circular economy investment, unlocking new forms of value creation and improving financial viability of circular business models. It enables operational transformation and determines how capital flows into circular activities. Design-phase innovations are central to this shift. Toxopeus et al. (2021) highlight how tools such as materials passports enhance standardisation and modularity, raising asset collateral value and supporting asset-based lending. Digital technologies also reshape pricing and risk assessment. Fallahi et al. (2023) introduce an AI model that predicts residual value in secondary markets, supporting credit scoring for service-based models. As circular firms shift from sales to use-based revenues (e.g., leasing, pay-per-use), they face new financial risks linked to asset performance and customer behaviour. To manage these risks, investment in sensors, data systems, and AI supports monitoring, maintenance prediction, and credit assessments. Kumar et al. (2025) show how fintech and machine learning enable green loans and results-based financing, aligning financial tools with circular economy needs. Advances in physical technologies also drive circular investment needs and opportunities: modular construction, additive manufacturing, and bio-based materials can improve resource efficiency and product longevity, potentially improving long-term cost structures. Similarly, innovations in waste processing technologies, such as automated disassembly and chemical recycling, may enhance material recovery and open new revenue streams.

Finally, bottom-up **social and market shifts** are also influencing investment needs for circular economy transitions. Changing market offers, evolving ownership models, and reputational pressures on firms and investors create demand-side dynamics that require adaptive financing and business strategies. Engaged consumers help de-risk circular business models. Toxopeus et al. (2021) show that pre-orders, long-term contracts, and community-based funding reduce perceived market risks and support credit access, especially for service-based models. Crowdfunding further reflects these shifting dynamics. Corsini and Frey (2023) document support for circular economy projects driven by environmental values rather than profit, illustrating the rise of civic capital as a complementary funding source.

5.1.2 Differences in circular strategies

Investment needs in the circular economy differ across circular strategies. This section starts with after-use models, which are more familiar to investors and have attracted the most funding – as discussed in chapter 4 – and gradually moves toward more challenging models from a financial perspective.

After-use circular strategies, such as recycling, urban mining, and material recovery, often require substantial capital investments in infrastructure, logistics, and processing capabilities. Mejia et al. (2026) show that circular start-ups operating in this domain attracted the highest funding levels, reflecting their capital-intensive nature. This is echoed by Ezeudu and Bristow (2025), who highlight the massive capital and recurrent expenditures required for solid waste management systems. Despite their potential to create new revenue streams via material recovery (Kumar et al., 2025), after-use strategies still face important financing challenges. Abdelhamid et al. (2025) highlight how the sequential and uncertain nature of urban mining investments makes them incompatible with conventional discounted cash flow models, necessitating more flexible financial evaluation methods. Additionally, Toxopeus et al. (2021) note that assets linked to recycling and recovery are often firm-specific and lack standardised secondary markets, reducing their suitability as collateral. Enhancing material transparency, modularity, and standardisation is therefore important for improving asset financeability and enabling wider adoption of after-use circular business models.

During-use strategies aim at extending the use phase of products, such as reuse, refurbishing, leasing, and product-service systems (PSS). By doing so, they reduce the need for new production and moderate overall resource demand. These models present a different investment profile, often

requiring upfront capital to build service capacity and product inventories but generate delayed revenue through ongoing customer engagement. Fallahi et al. (2023) point out that such a structural delay in revenue flows introduces a persistent financing barrier, particularly when firms transition from one-off product sales to service-based contracts. Similarly, De La Cuesta-González and Morales-García (2022) emphasise the liquidity constraints and asset retention risks inherent in such models. Toxopeus et al. (2021) identify several ways to address this. First, firms could invest in tools to mitigate short-term risk, such as securing long-term contracts, collecting payment reliability data, and designing transparent and bank-friendly contract terms. Second, credit access can be improved by building trust with lenders through evidence of customer "stick rates" and stable returns. These types of financial and relational investments are especially important for scaling PSS models, which rely on recurring cash flows but often face scepticism from traditional financiers.

Before-use circular strategies – often referred to as upper-R strategies such as refuse, reduce, and rethink – aim to prevent waste generation and improve resource efficiency from the outset. The EU Court of Auditors (European Court of Auditors, 2023) highlights that design-stage interventions are among the most impactful levers for achieving circularity outcomes. However, their investment profiles can vary widely. While some eco-design improvements can be incremental and cost-effective, more transformative "rethink" strategies often require redesigning entire products or systems. Ghisetti and Montresor (2020) refer to these more ambitious shifts as Circular Innovation Modes, characterised by long payback periods, technological uncertainty, and elevated market risks. Kumar et al. (2025) similarly argue that such strategies challenge traditional growth models and introduce novel financial risk-return dynamics. Although they may offer long-term cost savings and sustainability gains, they often demand substantial upfront capital and patient investors. Toxopeus et al. (2021) caution that these models may generate highly specific or experimental assets whose value is difficult to assess and collateralise, complicating access to finance. Yet practical examples – such as modular smartphones, eco-designed furniture, or standardised components in industrial design – show that such strategies can combine innovation with scalable economic models.

Sufficiency-based circular models have a distinct investment profile, though they often intersect with before-use and during-use strategies. Instead of maximising output or growth, they aim to reduce consumption through durability, sharing, and low-volume production. Mejia et al. (2026) show that sufficiency-oriented start-ups often demand modest funding while facing slow paths to profitability – for example those adopting slow-production and repair-based models in fashion and furniture. These ventures often reject venture capital in favour of mission-aligned, patient capital or equity-free sources, in order to retain control over values and impact orientation. This makes them difficult to finance through conventional mechanisms that prioritise rapid returns and asset turnover. Their cash flows rely on long-term service-based or low volume revenue streams (Fallahi et al., 2023), and they require innovation in financing logic as much as in product design (Kumar et al., 2025). Alternative finance mechanisms may help. Corsini and Frey (2023) show that crowdfunding supports early-stage, low-scale innovations driven by environmental or sufficiency principles, enabling community support and co-financing for models that might otherwise struggle to attract conventional funding. Cooperative funding may also offer a viable path. Van Opstal et al. (2025a) argue that member-based cooperatives - especially in housing and energy - can structurally embed sufficiency principles while mobilising capital from within their communities.

Box 5.1: Investment needs across circular strategies: examples from specific value chains

In the **electronics** sector, after-use strategies such as recycling and urban mining illustrate the capital-intensive nature of circular investments. Large-scale refurbishing and resale operations that recover and remarket millions of devices each year require extensive reverse-logistics networks, secure data wiping, and specialised refurbishing facilities. For most global brands, financing is facilitated by internal capital reserves, but smaller players struggle because yields are uncertain, resale values fluctuate, and assets are highly firm-specific, making them unsuitable as collateral (i.e., assets that can be pledged as security for loans). Rapid technological innovation also accelerates product obsolescence, eroding the future resale value of refurbished devices and increasing the risk of stranded inventories. Combining before-use and after-use strategies, modular smartphone designs prioritise easy repair, refurbishment, and recycling. Such models face high upfront R&D costs, complex supply chains, and uncertain market acceptance, while generating delayed returns (Parchomenko et al., 2023). They often rely on venture capital or patient impact investors willing to absorb long payback periods and residual value risks.

In the **fashion and apparel value chain**, during-use strategies like repair, reuse, and resale demand investment in collection logistics, sorting, and cleaning infrastructure, and they face barriers including delayed revenues, risk of brand dilution, and uncertain consumer demand. Before-use strategies involve eco-design and materials innovation, requiring capital for materials R&D and supply chain coordination. Some sufficiency-based approaches combine low-volume production and repair with strong social missions. Small fashion brands using slow production and repair-based models, for example, typically require modest capital yet face slow paths to profitability, limited economies of scale, and difficulty attracting conventional investors. These challenges are amplified by consumer behaviour, as many people still prefer buying new fashion items, adding further uncertainty to future cash flows (ETC CE, 2024f).

In **construction and renewable energy**, financing during-use and after-use strategies is often challenged by very long product lifetimes. Product-service system models struggle in this context: providers must bear large upfront costs but recover revenue slowly over decades, while being unable to retrieve fixed assets if clients default. This immobility undermines their value as collateral, extends payback horizons, and heightens perceived credit risk (Rabaia et al., 2024). After-use strategies face similar hurdles, as residual value is only unlocked far in the future, while financiers are mostly accustomed to shorter cycles.

5.1.3 Differences in scaling strategies

The transition to a circular economy requires financial strategies attuned to the ways in which circular business models scale. Following Moore et al. (2015a), three complementary scaling logics can be distinguished: scaling out, scaling up, and scaling deep. Each demands tailored financial instruments, institutional frameworks, and support mechanisms to enable broader replication, systemic integration, and cultural embedding of circular models.

Scaling out

Scaling out involves the horizontal replication of circular business models across regions, sectors, or user groups. Financial needs at this stage typically involve investment volumes focused on replication, experimentation, and local adaptation. Specific examples include franchise models, forming formal or informal partnerships with other organisations, or directly expanding the business model by opening new offices or service points in different areas (Moore et al., 2015b). Start-ups often expand through regional pilots or sector-specific applications (Mejia et al., 2026), relying on angel investors, small

grants, and incremental revenues. However, barriers such as limited demand maturity and regulatory variation call for adaptive financing approaches rather than standardised ones.

Financial institutions have responded by creating investment vehicles that facilitate broader diffusion of circular models. Rataj et al. (2025) observe that large-scale instruments such as BlackRock's Circular Economy Fund and Intesa Sanpaolo's USD 6 billion credit facility mark an important shift from isolated pilot funding to mainstream financial products capable of supporting scaling out. Similarly, Kumar et al. (2025) highlight the Circular Bioeconomy Fund of the EIB as a targeted effort to extend circular economy principles across multiple industries and geographies, mobilising both public and private capital.

Successful replication also hinges on strategic non-financial investments. Toxopeus et al. (2021) emphasise that circular firms require upfront investments in building partnerships across their value chains, such as supplier collaborations and joint ventures, to reduce delivery risks and signal credibility to potential financiers. These inter-organisational links act as critical enablers of scaling out, particularly in unfamiliar or less mature markets.

From a policy perspective, scaling out also requires alignment with national institutional contexts. Austin and Rahman (2022) stress that the uptake of cohesive circular economy financing policies varies significantly across the EU, depending on whether countries fall into a 'leader', 'performer', or 'catcher' category. These national differences imply that replication of circular economy financial mechanisms across borders must account for local governance conditions, regulatory frameworks, and SME ecosystem readiness. The country case studies in Section 4.3. support this statement. From a policy perspective, scaling out also requires alignment with national institutional contexts. Austin and Rahman (2022) stress that the uptake of cohesive circular economy financing policies varies significantly across the EU, depending on whether countries fall into a 'leader', 'performer', or 'catcher' category. These national differences imply that replication of circular economy financial mechanisms across borders must account for local governance conditions, regulatory frameworks, and SME ecosystem readiness. The country case studies in Section 4.3. support this statement.

Finally, Corsini and Frey (2023) demonstrate that alternative finance mechanisms such as crowdfunding are instrumental in supporting decentralised innovation. Particularly for early-stage initiatives, crowdfunding enables the piloting and replication of small-scale sustainability projects across contexts. This bottom-up diffusion mechanism illustrates another route of scaling out circular economy models, one that prioritises contextual experimentation and peer learning across regions.

Scaling up

Scaling up entails moving from experimentation to structural integration in mainstream markets. This transition requires a different financial logic – ensuring the alignment of financial instruments, institutional capabilities, and systemic reforms that move beyond pilot initiatives.

At the macro level, institutional actors and multilateral development banks (MDBs) such as the European Investment Bank (EIB) play a pivotal role by deploying multi-instrument programmes, such as blended finance, guarantees, and strategic advisory services, that reduce risk and increase the maturity and visibility of circular investments (Rataj et al., 2025). The EUR 16 billion pledge by the EIB and JICE is part of a broader ambition to mainstream circular economy investments and support systemic transitions (The Joint Initiative on Circular Economy (JICE) steps up its commitment to provide €16 billion to circular projects by 2025 and welcomes Invest-NL as new member, 2024). Such interventions signal credibility to private investors, enable larger capital inflows, and help transform circular economy projects from niche experiments into scalable business opportunities. As described

in Sections 3.3.1 and 3.3.2, MDBs' role is crucial in linking both circular economy and sustainable finance policies at the EU level with finance sector.

Scaling up also exposes the limitations of traditional lending. As illustrated in Section 5.5, product-as-a-service models, for instance, rely on long-term service revenues and asset retention, which are often undervalued by conventional finance (Fallahi et al., 2023). Addressing this requires both new financial products and institutional learning. Therefore, for example, the circular economy working group in the Dutch financial sector assesses different approaches to risk considerations of business models which are not linear (Source: Interview with DNB, see also Box 3.2 in Section 3.3.3). Toxopeus et al. (2021) stress the importance of building secondary markets, standardising asset valuation, and securing regulatory recognition of reused materials as bankable collateral.

Emerging financial innovations – such as results-based financing and performance-linked loans – help firms with proven models to access larger investment volumes while reducing investor uncertainty (Kumar et al., 2025). These innovations can be complemented by public equity funds, sustainability oriented venture capital, and thematic corporate bonds designed to institutionalise circular investment flows (Austin and Rahman, 2022).

Scaling up remains constrained by deeper structural barriers within the financial sector. Private investors often perceive circular economy ventures as high-risk, not only because of market and regulatory immaturity, but also because they require financing entire value chains – encompassing suppliers, processors, and service partners – rather than individual firms. This interconnectedness increases exposure and complicates standard risk assessments. As De La Cuesta-González and Morales-García (2022) argue, marginal reforms will not suffice. Institutional innovation is needed, particularly in the assessment of value chains as integrated contractual ecosystems. Banks must learn to evaluate not just individual firms, but the robustness and reliability of the circular networks in which they are embedded. Without such shifts in financial logic and practice, the full-scale deployment of circular business models will remain constrained.

Scaling deep

Scaling deep refers to the cultural, cognitive, and institutional embedding of circular economy principles within financial and business systems (Han et al., 2023; Moore et al., 2015a). This dimension centres on shifts in values, norms, and relationships that allow circular models to transform dominant practices over time.

Institutional change plays a central role in enabling scaling deep. Rataj et al. (2025) document how banks engaged in circular economy financing experience a structural shift in organisational logics, with sustainability values overriding profitability imperatives during the early phases of transition. This shift signals a redefinition of value within financial organisations, supported by internal processes of learning and unlearning. Such transformations reshape decision-making and allow circular economy investments to gain credibility and consistency over time. Kumar et al. (2025) similarly highlight finance as a lever for transformation. Their study emphasises the importance of institutional learning, customer education, and aligned metrics to internalise circularity principles. Technological tools such as fintech, artificial intelligence, and sustainability-linked financial instruments contribute to this internalisation.

Fallahi et al. (2023) further stress the need for a new financial logic grounded in relationships and ecosystem trust. Their research shows that banks must co-evolve with circular business models by engaging with networks of service providers, refurbishers, and second-hand platforms. This co-evolution supports shared risk, co-creation of residual value, and long-term commitment to circular

ecosystems. Toxopeus et al. (2021) reinforce this perspective by focusing on the soft infrastructure required for deeper embedding. Customer participation, supplier guarantees, and transparent service contracts reconfigure how value is generated and perceived. Investment in these social and relational components, along with digital transparency tools and engagement platforms, helps to shift financial norms and enhance the stability of circular economy financing.

Community-based financial innovations also support scaling deep. Corsini and Frey (2023) show that crowdfunding platforms enable interactive engagement between project creators and funders, supporting iterative product development and embedding of environmental values. Feedback mechanisms and co-design features help foster behavioural and cultural shifts in both producers and consumers. De La Cuesta-González and Morales-García (2022) offer a complementary view by conceptualising “circular finance” as a reconfiguration of financial reasoning itself. This includes holistic assessments of value chains, co-design between banks and entrepreneurs, and circular economy specific indicators in risk modelling. Trust-based arrangements, such as forward contracts, leasing chains, and joint guarantees, would foster a deeper change within finance practices and create the institutional conditions needed for a circular economy to take root.´

Box 5.2: Investment needs and scaling strategies: some illustrative examples for the circular economy

Networks of **reuse shops** seeking to expand geographically (scaling out) may benefit from economies of scale when investing in sorting centres, quality control systems, shared digital inventory platforms, and distribution hubs that enable exchanges between outlets (Gorissen et al., 2016). Financing needs focus on replication, experimentation, and local adaptation, yet are often hampered by fragmented demand, limited coordination between municipalities, and varying local regulations. To overcome these barriers, ventures must combine small grants, community funding, and long-term, flexible patient capital with non-financial investments in partnerships and volunteer management to anchor themselves in new regions.

Scaling up of the circular economy is emerging in the **construction and renewable energy sectors**, where reclaimed construction materials, refurbished heating, ventilation, and air-conditioning (HVAC) installations, and reused electrical components are moving from small pilots into mainstream markets. However, these components cannot be introduced through trial-and-error: their acceptance depends on formal certification, performance warranties, and compliance with strict safety standards. Establishing these frameworks demands capital-intensive investments in testing facilities, quality assurance systems, and traceability infrastructure, as well as coordinated engagement with regulators to adapt building codes, product standards, and electrical safety regulations to circular innovations (Van Opstal et al., 2025a). Financing this transition requires instruments that can support value chain–wide upgrades, encompassing logistics providers, certifiers, and installers, rather than isolated firms. Without such systemic and regulatory alignment, circular components remain locked out of mainstream procurement channels despite their technical viability.

Scaling deep of the circular economy is particularly crucial in both **textiles and electrical and electronic equipment (EEE)**, as customer acceptance of circular value propositions requires investments in education, behavioural campaigns, and warranty schemes that reshape how repair, reuse, and sharing are valued. Customer acceptance is often constrained by deeply embedded perceptions that reused or repaired products are less clean, less safe, or of inferior quality. In textiles, concerns about hygiene and contamination discourage some consumers from purchasing second-hand garments, even when they meet recognised reuse-quality guidelines (Hur, 2020). Similar perceptions define attitudes toward refurbished electronics, where doubts about the cleanliness, reliability, or lifespan of reused devices undermine trust. These barriers are amplified by strong cultural and societal preferences for novelty: fast fashion markets actively promote ever-changing styles, while rapid technological innovation fuels the desire to own the newest electronic models. At the same time, many users keep old devices rather than returning or reselling them, which can create household stockpiles that reduces near-term supply and deters the emergence of functioning reuse channels (Pamminger et al., 2021).

5.2 Investment gaps

5.2.1 How big is this investment gap?

Although momentum around green finance is growing, circular economy investments remain comparatively marginal to broader sustainability finance. Fang et al. (2024) report that in 2021, just USD 15 billion in private finance was directed toward circular economy-related activities, compared to USD 8.4 trillion in overall sustainable finance globally. As reported in Table 4.1, the Platform on Sustainable Finance (PSF) reports annual circular economy investments in the EU at just EUR 18 billion, out of EUR 764 billion in total sustainable investments. Other estimates suggest higher amounts: the EU Circular Economy Monitoring Framework (CEMF) places private circular investments at approximately EUR 137.63 billion, while the EIB-EC study estimates that total annual circular economy investments in the EU currently amount to EUR 120 billion, with EUR 111 billion from private sources and EUR 9 billion from public funding (EIB-EC, 2026). Finally, a recent study by Summa Equity (Summa Equity, 2023) estimates the cumulative investment needs for a circular and waste-free Europe of EUR 230 billion for physical assets and infrastructure by 2040.

When these current levels are placed against projected needs, a substantial structural gap becomes visible. As mentioned in chapter 4 (Table 4.1), at the EU level, achieving circular economy objectives is projected to require EUR 1.2 trillion in cumulative new investments by 2040, equivalent to an annual investment gap of EUR 82 billion (EIB-EC, 2026). Putting this into a broader perspective, Kumar et al. (2025), drawing on UNCTAD and World Bank data, estimate that USD 3.3 to USD 7 trillion in annual investment will be needed to meet the Sustainable Development Goals at the global level, with the circular economy forming a structural pillar of this agenda. In developing countries alone, the annual investment need for sustainable infrastructure and basic services – including circular economy relevant actors – is estimated at USD 3.9 trillion. Rataj et al. (2025) place the annual global financing gap for climate and circularity transitions at USD 2.5 trillion through to 2050, signalling both the scale and urgency of coordinated financial mobilisation. These figures highlight the structural nature of the investment gap and underline that progress on the SDGs requires the circular economy to be internalised across policy frameworks, investment decisions, and market standards. Moreover, as Moneva et al. (2023) argue, no serious transition to a circular and climate-neutral economy will occur without a significant redirection of capital flows, particularly towards infrastructure and business model transformation.

At regional and sectoral levels, the investment gap persists despite well-documented opportunities. Mejia et al. (2026) highlight a EUR 6.7 billion shortfall in the European plastics recycling sector (European Investment Bank, 2023) and identify unmet capital needs of EUR 80–180 million among just 64 circular firms in the Netherlands (van Ginkel et al., 2024). These numbers reflect a broader problem: insufficient funding for scaling circular innovations, even in advanced economies. SMEs often struggle to move beyond the pilot stage, constrained by limited external finance and underdeveloped investment ecosystems. Public funding remains unpredictable, and private capital often overlooks circular economy projects due to perceived risk.

At the local level, municipalities face related obstacles in securing finance for circular economy infrastructure. Ezeudu and Bristow (2025) find that despite numerous instruments and international support, cities encounter persistent difficulties in securing long-term, context-appropriate funding for circular waste management. Likewise, regional and local circular hubs face difficulties in securing stable funding to sustain operations over medium- to long-term timeframes (Van Opstal et al., 2025b).

5.2.2 Why is there an investment gap?

The investment gap in the circular economy arises from a persistent mismatch between accelerating capital needs and limited financial supply. Despite policy momentum, private investment remains modest due to unfamiliar business models, perceived risk, and structural hurdles such as ambiguous definitions, inadequate disclosure, and weak legal incentives (Fang et al., 2024; Kumar et al., 2024;

Moneva et al., 2023). Circular ventures often involve high upfront costs, long payback periods, and non-linear returns, which traditional financiers struggle to assess due to poor alignment with standard credit scoring models and underdeveloped tools for valuing circular assets (de la Cuesta-González and and Morales-García, 2022; Fallahi et al., 2023; Mejia et al., 2026). Additionally, circular risk, rooted in uncertainties around consumer behaviour, asset residual value, and system design, raises the cost of capital and lowers investor appetite (Ghisetti and Montresor, 2020). On the demand side of funding, many firms lack the financial readiness, internal capacity, and strategic alignment to attract investment, reinforcing systemic underinvestment, especially in SME-driven and municipal transitions (Agyapong and Tweneboah, 2023; Ezeudu and Bristow, 2025).

These interlocking failures reflect deeper market dysfunctions. A first core market failure constraining circular economy investment is **information asymmetry** between investors and circular ventures. Investors frequently misunderstand or undervalue circular business models, especially those with non-linear revenue streams or intangible assets (Mejia et al., 2026). Traditional credit assessments remain anchored in solvency metrics and physical collateral, which circular firms often lack due to reliance on durable assets, long-term service contracts, and innovation-specific intangibles (de la Cuesta-González and and Morales-García, 2022). Limited circularity-related financial literacy within banks and opaque circularity disclosures aggravate these gaps, reducing transparency and impairing investor trust (Keskin and Esen, 2024; Moneva et al., 2023). The result is a misalignment between what circular firms offer and what financiers recognise as valuable or secure, particularly for SMEs and early-stage ventures without proven track records (Toxopeus et al., 2021).

A second fundamental market failure lies in the existence of **externalities** (Grafström and Aasma, 2021). Many circular economy ventures generate long-term social and environmental value - such as resource preservation, emission reduction, and supply chain resilience - that do not translate into immediate financial returns (Austin and Rahman, 2022). Because financial markets rarely internalise these positive externalities, circular firms are disadvantaged in capital allocation compared to linear models that externalise negative costs (Aboulamer et al., 2020). Investors hesitate to fund models that create environmental gains without monetisable signals, especially when revenue is delayed or uncertain, as in Product-as-a-Service schemes (Fallahi et al., 2023). Even sustainability-focused investors often overlook systemic gains, which results in underinvestment despite the broader societal utility of circular economy practices (Mejia et al., 2026).

These market failures are compounded by **knowledge spillovers**, split incentives, and incomplete markets, which both result from and reinforce the underlying inefficiencies. Knowledge generated by pioneering circular economy firms often spills over to competitors without reward, reducing first-mover incentives (Austin and Rahman, 2022). Moreover, circular infrastructure such as recycling hubs or secondary material standards displays characteristics of public goods, requiring collective investment but generating dispersed benefits. This dilutes private incentives to invest. Moreover, it generates a **split incentive** problem – a misalignment between value chain actors who incur the costs of circular investments and those who benefit from their long-term benefits (Van Opstal et al., 2024).

Furthermore, **incomplete markets** — occurring when some goods or risks cannot be traded or insured — constrain capital flows into circular economy initiatives. Financiers often apply risk models ill-suited to circular ventures, classifying them as “too risky” due to perceived asset illiquidity, delayed returns, and uncertain consumer behaviour (Ghisetti and Montresor, 2020). This classification often persists even when circular models reduce long-term environmental or supply risks, revealing a structural mispricing of financial risk. In parallel, absent standards, warranties, or trusted intermediaries obstruct the development of stable markets for recycled or second-life products, components, and materials (Grafström and Aasma, 2021; Strupeit et al., 2024), preventing supply and demand from meeting under predictable conditions and further deterring investment. For recycled materials in particular,

demand remains unstable because regulations intended to drive uptake are unclear or change frequently, which weakens price signals, complicates offtake contracting, and disincentivises investment.

Investment barriers in the circular economy also stem from broader **ecosystem failures and institutional lock-ins**. Fragmented coordination between financial actors, regulators, and circular ventures firms undermines systemic alignment (Kumar et al., 2024; Sepetis, 2022). Financing ecosystems remain embedded in linear logics, with legacy systems, performance incentives, and disclosure standards poorly suited to circular metrics (Moneva et al., 2023; Rataj et al., 2025). This path dependency favours short-term, low-risk investments and discourages experimentation with circularity-aligned instruments. Moreover, underdeveloped support infrastructures, such as risk-sharing mechanisms, valuation frameworks for circular assets, and inclusive intermediary networks, hinder access to finance, particularly for SMEs and community-level actors (Agyapong and Tweneboah, 2023; Toxopeus et al., 2021). These systemic shortcomings mean that even prepared firms may fail to attract capital if embedded in institutional contexts that do not reward circular performance (Abdelhamid et al., 2025; Austin and Rahman, 2022).

Box 5.3: The investment gap: examples from specific value chains

In the **packaging** sector, companies developing reusable packaging systems encounter structural disincentives because their environmental gains are positive externalities that do not generate immediate cash flows. Service-based packaging models require expensive logistics infrastructure and depend on future behavioural change, yet financiers apply risk models that prioritise short-term sales volumes and tangible collateral (Toxopeus et al., 2021). Producers of recycled plastics packaging face competition from virgin plastics alternatives whose prices remain artificially low because they do not internalise the negative externalities of pollution and carbon emissions. This structural price distortion further undermines the business case for reusable systems, resulting in systemic underinvestment even when these models could cut waste and emissions at scale.

In the **renewable energy** sector, firms developing reuse and refurbishing operations for solar photovoltaic modules, inverters, and batteries for electric vehicles struggle to attract finance despite growing technological maturity. They face incomplete markets: there are still few trusted standards, warranties, or residual-value benchmarks for second-life energy components, making future cash flows difficult to predict and assets hard to collateralise (Strupeit et al., 2024). The absence of stable markets for secondary products reinforces investor perceptions of risk and discourages lending, even though these ventures could strengthen supply security, reduce critical material demand, and extend the lifespan of existing energy infrastructure.

In the **water and sanitation** sector, municipal projects recovering heat, nutrients, or biogas from wastewater may be trapped in institutional lock-ins. Their benefits accrue across multiple actors - utilities, municipalities, and citizens - while the costs are borne by the operator (EEA, 2022). This split incentive problem deters private co-financing, and fragmented regulatory frameworks impede coordinated investment.

5.3 Financing solutions and enablers

As discussed in previous chapters, over the past decade, the European Union, its Member States, and public finance institutions such as the EIB have introduced a series of initiatives to help bridge the circular economy financing gap. Despite these advances, financing for circular business models and infrastructure remains far below the levels needed to achieve the EU's circular transition objectives.

This section explores how financial systems can evolve further to close this gap. It first presents innovative financing solutions as suggested by academic and policy literature (Section 5.3.1), highlighting how new instruments, contractual models, and digital tools could improve access to capital for circular ventures. It then turns to the enablers and boundary conditions (Section 5.3.2) that determine whether these approaches can scale – covering institutional, regulatory, and cultural factors that shape investor behaviour and risk perception.

5.3.1 Financing solutions

At the firm level, bankability improves when lenders can see predictable cash flows and credible collateral. Firstly, customer contracts provide tangible proof of market demand and revenue stability. Service agreements, pre-orders, and buy-back commitments provide lenders with evidence of future income, even when companies have little financial history. Secondly, product design can also support financing. When assets are modular, repairable, or retain resale value, they can serve as credible collateral (Toxopeus et al., 2021). Digital product passports and traceability tools may make such assets easier to value, reducing the uncertainty that deters lenders (Kumar et al., 2025; Rataj et al., 2025). For early-stage firms, blended finance that mixes grants, equity, and subordinated debt can help bridge the long period before revenues materialise. Patient or milestone-based capital allows investors and investees to share early risk without demanding immediate returns (Mejia et al., 2026).

At the level of financial instruments, results-based financing could link payments to verified circular outcomes, such as waste reduction or resource-efficiency improvements (Kumar et al., 2024; Sepetis, 2022). Green bonds, thematic funds, and sustainability-linked loans may include circular economy criteria, which could encourage firms to commit to measurable targets. Digital finance and AI tools can make these mechanisms more precise. Fintech platforms and data-driven credit analytics may help to monitor performance and estimate residual value, while AI models trained on market data may outperform manual assessments in predicting collateral value, for instance for second hand markets (Fallahi et al., 2023). These innovations may gradually reduce the information asymmetries that keep circular ventures outside standard credit channels (Abdelhamid et al., 2025).

Cities and regions are applying these financial instruments through place-based financing mechanisms. A clear example is a green municipal bond. A city raises money from investors and commits to spend it on named circular projects – for example modular construction, cleaner urban transport, or land restoration (Howard et al., 2022). The bond is linked to a few easy-to-check indicators – such as waste avoided, higher reuse rates, or carbon saved – so progress is visible and investors see what their money achieves. The same approach can fund practical local actions, including reuse and repair hubs, sorting and recycling facilities, upgrades that switch production towards recycled inputs, and digital platforms that connect repair services or reuse markets. As cities emerge as focal points of experimentation in circular transitions, such territorially anchored financing innovations complement national and multilateral funding strategies by building local institutional ownership and visibility (Bolger and Doyon, 2019).

At the ecosystem level, several financing approaches and instruments can help circular projects to attract public and private funding. Public finance bodies can mix grants with loans or equity so that early risks are shared and projects become more attractive to investors (de la Cuesta-González and and Morales-García, 2022). Multilateral banks can combine instruments such as loans, equity, and guarantees, and can coach project developers so that proposals are ready for funding (Kumar et al., 2024). For very small or new firms, peer-to-peer lending and reward-based crowdfunding can offer a first step when banks say no (Corsini and Frey, 2023). Joint action across a value chain also matters. Public–private co-financing can pay for shared facilities such as reverse-logistics depots, waste-to-value plants, and repair hubs (Ezeudu and Bristow, 2025). In some sectors, “pay later” plans and “pay-

per-use" leases[11] make it easier for customers to choose circular options. Costs are spread over time and payments depend on how much the product is used or how well it performs. This creates a financial reward for designs that last, can be repaired, and cut carbon, because lower waste and lower emissions improve the returns for both the customer and the provider (Jauhari et al., 2025).

5.3.2 Enablers and boundary conditions

Making the financing solutions outlined above work in practice depends not only on money itself but also on the rules, standards, and habits that shape financial decisions. Banks, investors, and public institutions need clear and reliable ways to assess what is circular, how risky it is, and what the expected benefits are. Several authors identify the need for **improved risk assessment methodologies** and **standardised circular economy performance indicators** (Fang et al., 2024; Kumar et al., 2024). Agreed indicators for circular performance would make it easier for investors to compare projects and price loans more accurately. Better data – collected through sustainability reporting and digital monitoring – can show how companies reduce waste, save materials, or design longer-lasting products. These insights help lenders understand value that is not visible in traditional financial statements. International benchmarks, such as the EU Taxonomy and new disclosure standards, are already helping to make this information more consistent (Moneva et al., 2023). Clear rules on what can count as collateral, on how waste is classified, and on who remains responsible for products at the end of their life would also make lending less risky (Toxopeus et al., 2021).

Public authorities and financial institutions can help close the investment gap by taking a **proactive role in supporting circular transitions**. Regulators and central banks can direct credit towards sustainable activities and limit lending to highly resource-intensive sectors. MDBs, such as the European Investment Bank, already reduce risk by combining loans with guarantees and by helping cities and regions prepare credible circular projects (Ezeudu and Bristow, 2025). They also apply the EU taxonomy, whose exclusion criteria help avoid funding environmentally harmful activities and further integrate environmental considerations into lending decisions. Local banks are often better placed to fund small and medium-sized circular firms because they understand regional markets and maintain close relationships with clients (Toxopeus et al., 2021). Collaboration between public and private financiers – for instance through blended finance or public–private partnerships – can lower borrowing costs, spread risk, and make early investment in circular ventures more feasible (Ghisetti and Montresor, 2020; Mejia et al., 2026).

Beyond financial instruments, a **cultural and institutional shift** is needed. Banks and investors must learn how circular business models work and adjust their internal processes accordingly (Sepetis, 2022). Firms, policymakers, and researchers can work together to build financial expertise and tools that are adapted to circular goals (Austin and Rahman, 2022). Wider participation also matters. Community-based investment models, sustainability-oriented crowdfunding, and small grant schemes can involve citizens directly, improving trust and legitimacy in circular transitions (Agyapong and Tweneboah, 2023; Corsini and Frey, 2023; Van Opstal et al., 2025a).

5.4 Case study: circular start-ups as frontrunners in detecting challenges and needs

Circular start-ups play a pivotal role in driving transformative circular innovation across sectors, yet they often operate in funding environments that fail to recognise their value creation logic. This

[11] "Pay later" plans spread the cost of a circular product or service over time, for example when households pay for an efficient appliance or repair in monthly instalments instead of upfront. "Pay-per-use" leases link payments to actual use, for example when businesses pay per printed page rather than buying a printer, or when households pay per wash cycle instead of owning a washing machine, which encourages long-lasting and repairable designs (Bocken et al., 2018).

thematic deep dive draws policy reports and academic literature to examine the distinctive financial challenges circular start-ups encounter, identify enabling conditions and adaptive funding approaches, and outline implications for entrepreneurs, funders, policymakers, and intermediaries.

5.4.1 Circular start-ups as frontrunners in detecting challenges and needs

The relevance of this case study lies in the strategic role that circular start-ups can play in achieving the European Union's competitiveness and sustainability ambitions. As outlined in the Competitiveness Compass for the EU (EC, 2025a), circular economy innovation contributes to all three pillars of the EU's renewed competitiveness strategy: boosting productivity through innovation, accelerating decarbonisation and circularity, and securing access to critical raw materials. Circular start-ups sit at the nexus of these priorities, offering high-potential, scalable innovations that address material efficiency, resource substitution, and novel business models.

Start-ups are young firms within their first four to six years of operation (Henry et al., 2020; von Kolpinski et al., 2023), characterised by their focus on innovation, growth orientation, and ambition to scale (European Investment Bank, 2020; Hockerts and Wüstenhagen, 2010; Ries, 2011). Circular start-ups further differentiate themselves by embedding circular strategies – such as reuse, recycling, product redesign, and service-based business models – at the core of their operations (Geissdoerfer et al., 2020). This foundational commitment to circularity positions them as critical actors in transforming existing linear economic structures.

Unlike incumbent firms, circular start-ups are often referred to as capable of driving radical rather than incremental innovation. In their seminal framework, Hockerts and Wüstenhagen (Hockerts and Wüstenhagen, 2010) characterise such start-ups as "Emerging Davids" who challenge "Green Goliaths" – established firms that pursue more risk-averse sustainability strategies. By designing business models from scratch, circular start-ups can experiment with novel ways of creating and capturing value, disrupting sectoral norms and reshaping how circularity is defined across industries (Bocken et al., 2017; Ostermann et al., 2021). This strategic positioning allows circular start-ups to serve as change agents not only within their markets but also within the broader circular innovation ecosystem (Pruijsen, 2019).

Several features make circular start-ups particularly well-suited to test and implement ambitious circular strategies. They typically operate with fewer organisational constraints, greater flexibility, and stronger independence in decision-making (Henry et al., 2023; Tuladhar et al., 2024). These characteristics increase their capacity to pursue higher-order circular strategies, such as reducing material inputs or encouraging reuse, that incumbent firms often avoid due to sunk investments or established supply chains (Bauwens et al., 2020).

Despite these strengths, circular start-ups face substantial barriers in securing finance. Their early-stage, resource-intensive innovation trajectories often fall outside the risk appetite of mainstream funders. Evidence shows that banks tend to favour more mature firms transitioning incrementally from linear to circular models, supported by established cash flows and tangible assets (Toxopeus et al., 2021). By contrast, circular start-ups that pursue disruptive, service-oriented models often challenge dominant logics of ownership and material throughput, making them less attractive to conventional finance providers (Mejia et al., 2026).

The result is a persistent underrepresentation of circular start-ups in the entrepreneurial landscape. For instance, circular start-ups constitute less than 5% of the total start-up population in the Netherlands (Bauwens et al., 2020), and similar figures are echoed in other industrialised regions. This underrepresentation stems not from a lack of relevance or ambition, but from structural mismatches in financial support mechanisms and institutional support ecosystems. The OECD (2025) stresses the

importance of de-risking investment in early-stage circular ventures through blended finance mechanisms, such as Public-Private Partnerships (PPPs), which can catalyse experimentation in high-impact areas including circular industrial parks and resource-sharing platforms.

Seen in this light, circular start-ups are not only pioneers of innovation, but also frontrunners in detecting the systemic challenges and evolving needs within circular economy finance – offering important insights for building more inclusive and adaptive funding frameworks.

5.4.2 Explaining investment gaps for circular start-ups

Start-ups in general face high failure rates and significant financing risks. In general, around 90% of start-ups fail, with approximately 30% ceasing operations within the first two years and around 50% by year five (Getautopsy, 2022). In the United States, more than two-thirds of start-ups never generate a positive return for investors (Eisenmann, 2021). Common causes of failure include a lack of product–market fit, poor customer acquisition strategies, internal team problems, and financial constraints – particularly running out of cash or failing to secure additional investment (Arnaud, 2018; Cantamessa et al., 2018). While these risks are well recognised, they are magnified in the case of start-ups pursuing circular business models due to structural and systemic mismatches with conventional funding logic.

The conventional funding trajectory

In a typical early-stage trajectory, start-ups move from a proof of concept to a minimum viable product (MVP) before entering the market and seeking to scale. Initial **pre-seed** funding often relies on personal savings, informal sources (the "3Fs": family, friends, and fools), or small public grants (Bergset and Fichter, 2015). This funding is typically used to build a minimal viable product (MVP) and search for a product-market fit. This is followed by **seed funding** from business angels or venture capital investors, based on metrics such as market traction, user growth, and early customer retention. Only later, in **Series A or B funding** rounds, financial metrics such as gross margins, EBITDA, and profitability become central to demonstrate a solid and scalable business model. Debt financing, such as bank loans, is rarely accessible in early stages due to unpredictable cash flows and a lack of collateral. Instead, equity investment dominates. However, conventional metrics across all stages are geared towards linear growth, fast returns, and tangible assets – elements often misaligned with circular models (Mejia et al., 2026). The impact generated by circular start-ups is rarely monetised and requested by investors. However, the paradox is that impact creation is the foundation of these businesses: they internalise social and environmental costs when their linear counterparts externalise them, challenging the competitiveness of circular start-ups (Circle Economy, 2025b).

Structural barriers along the funding trajectory of circular start-ups

While circular start-ups follow the same investment stages, their business models frequently challenge dominant production and consumption patterns. As a result, they do not easily align with established investor expectations or standard performance indicators (Mejia et al., 2026; Toxopeus et al., 2021). Research on financing circular start-ups remains limited, but key insights from emerging studies provide a clearer view of the unique challenges they encounter at different stages.

During the **pre-seed stage**, start-ups in the circular economy often require more capital in early development due to cost-intensive research and prototyping of novel products or services (Kasana et al., 2024). Localised production, recycled materials, and sustainable sourcing strategies further raise costs compared to linear counterparts. In addition, many operate in value chains that remain linear, with limited stakeholder cooperation and consumer behaviour still geared toward cheap, disposable goods (Bocken et al., 2019; Kasana et al., 2024). These constraints hinder market acceptance and delay the development of a viable product. Furthermore, although public funding plays a critical role, access

remains difficult. Many entrepreneurs lack the internal capacity to navigate complex application processes (von Kolpinski et al., 2023), despite the fact that nearly all rely on grants or subsidies at some point in their journey (Mejia et al., 2026). Investors in this phase generally look for proof of concept, product-market fit, and signs of user feedback. Yet circular propositions may be too unfamiliar or asset-heavy to meet these expectations. The novelty of circular solutions creates a "perception gap" between entrepreneurs and investors (Millette et al., 2020), slowing progress towards early-stage funding. In the meantime, many founders experience acute financial pressure to cover their own living costs, which can force promising teams to discontinue their ventures prematurely.

By the **seed stage**, many circular start-ups face commercial barriers such as low profit margins and limited economies of scale (Kanda et al., 2024; Kasana et al., 2024). Sustainable materials and small-scale production increase costs, while market demand remains insufficient to support wide adoption. Consumers are often unwilling to pay a price premium, especially where cheaper linear alternatives dominate (Saarinen and Aarikka-Stenroos, 2023). These conditions create market risk and make it difficult for start-ups to demonstrate scalability or profitability – core criteria for seed investors. Even when an MVP exists, circular start-ups may not meet expectations for fast growth, particularly when their mission prioritises environmental or social outcomes over financial returns (Kanda et al., 2024; Mejia et al., 2026). Skills shortages in circular design, logistics, and impact management further constrain team development and capacity to scale (Borms et al., 2023).

Regarding **Series A & B funding**, challenges persist, even where early traction has been demonstrated. Revenue models such as product-as-a-service generate recurring income but delay profitability and introduce credit risks from end-users. Asset-light models, common in digital or service-based circular businesses, also limit access to debt financing due to the absence of collateral (Toxopeus et al., 2021). At this stage, traditional investors focus heavily on standardised metrics such as profit margins, recurring revenue, and return on investment. Circular ventures that prioritise reuse, longevity, or environmental performance may struggle to meet these criteria, regardless of social or environmental impact. As a result, even proven circular start-ups encounter a funding bottleneck.

Misalignment between circular start-ups and conventional finance

These stage-specific barriers reflect a deeper systemic mismatch between how circular businesses create value and how current funding systems measure it. Traditional KPIs such as growth rates, capital efficiency, and profitability are rooted in linear assumptions about ownership, throughput, and asset accumulation. In contrast, circular models often prioritise long-term regeneration, resource decoupling, and social value – none of which are adequately captured by conventional valuation methods (Saarinen and Aarikka-Stenroos, 2023).

Moreover, broader ecosystems – including consumers, supply chain actors, and financial institutions – remain largely unadapted to the logic of circular start-ups. Many stakeholders in production, transport, or retail are unfamiliar with circular modes of collaboration. Consumers continue to favour ownership and low-cost, short-lifespan products. Investors seek fast, predictable returns. In this context, circular business models remain undervalued and underserved by conventional financial infrastructure.

5.4.3 Solutions and enablers for circular start-up finance

Because barriers arise from systemic misalignments in how value is defined, financed, and institutionalised, policy interventions and financial instruments need to go beyond adapting existing structures.

First, **tailored public financial support**, such as public grants and subsidies, remain essential in the early stages of circular entrepreneurship, especially where product–market fit is uncertain and commercial viability is not yet demonstrated. Given that private investors often struggle to assess circular models using traditional metrics, public funding can de-risk early-stage experimentation and signal confidence in the underlying proposition. However – as there is no such thing as a 'typical' circular start-up – such support must be carefully designed to respond to the specific barriers associated with different circular strategies (Van Opstal and Borms, 2023). Fiscal incentives can further enhance the attractiveness of circular ventures by improving their profitability. Differentiating taxation based on material circularity – such as penalising virgin resource use while incentivising renewable or reused inputs – could steer investment flows in more sustainable directions (Saarinen and Aarikka-Stenroos, 2023). That said, dependence on public incentives also introduces regulatory risk, as profitability becomes tied to political decision-making. This can make ventures less attractive to risk-averse financiers, highlighting the need for stable, long-term frameworks.

Second*,* **strategic partnerships** with established firms can help reduce perceived risk and facilitate access to funding. Larger companies can act as early customers, suppliers, or guarantors, thereby stabilising revenue streams and reinforcing trust in the start-up's model (Bauwens et al., 2020). Service contracts or outsourcing agreements with incumbents have also been shown to lower capital requirements, making start-ups more investable without requiring drastic internal restructuring (Tuladhar et al., 2024; Van Opstal and Borms, 2024). By plugging into existing supply chains, entrepreneurs gain indirect access to finance, markets, and infrastructure.

Third, **regulatory sandboxes** offer a controlled environment where entrepreneurs can test innovative models under temporarily relaxed regulatory conditions. This supports experimentation with novel approaches that may not yet be fully recognised under existing legislation. Sandboxes also promote dialogue between regulators and innovators, enabling more responsive policymaking (Van Opstal and Borms, 2023).

Fourth, as circular start-ups remain poorly understood by many investors, **educational programmes on circular business models and impact pathways**, combined with the promotion of success stories can help shift perceptions. Demonstrating tangible examples of financial and environmental returns can reduce uncertainty and encourage a broader range of investors to engage with circular models.

Fifth, **alternative financing models** are needed to accommodate the specific risk-return profiles of circular ventures. These include impact investment, blended finance instruments that combine public and private capital, and mission-aligned funding from philanthropic or cooperative sources. Given the limitations of conventional venture capital in addressing non-linear growth paths, these adaptive instruments can better align with long-term, regenerative business logic.

Finally, many entrepreneurs working on circular solutions remain disconnected from mainstream finance ecosystems. **Strengthening links between these ventures and financial institutions** - through networking events, investment readiness programmes, and matchmaking platforms - can improve their visibility and credibility (Van Opstal et al., 2025b). These connections are especially critical for early-stage businesses that lack financial networks or established reputations.

5.4.4 Implications

Implications for circular start-up entrepreneurs

Entrepreneurs seeking to build circular start-ups must be prepared to navigate misaligned funding environments and limited institutional understanding of circularity. While flexibility, mission-driven innovation, and experimentation remain core strengths, circular ventures should also invest in articulating clear value propositions for different types of investors. This may include combining environmental or social outcomes with credible financial forecasts or pursuing partnerships with established firms to access capital indirectly and reduce perceived risk.

Start-ups can also benefit from proactive engagement with support ecosystems – such as incubators, accelerators, or regional development agencies – that understand circular principles and can assist with grant applications, investor matchmaking, or business model refinement. Circular start-ups should prepare for slower scaling trajectories and consider alternative growth narratives that prioritise long-term impact over short-term profit. Where appropriate, hybrid models—such as social enterprises or cooperatives – may offer governance and financing pathways more aligned with circular goals.

Implications for financial institutions and investors

For investors, the key challenge is adapting investment strategies to recognise the specific characteristics of circular business models. Traditional valuation metrics fail to capture the long-term value offered by circular solutions. Investors, particularly those in the seed and early growth stages, should complement conventional indicators with broader impact metrics and risk assessment frameworks that account for environmental and societal returns.

Addressing this gap requires more than financial adaptation; it calls for a paradigm shift towards collaborative investment practices. Investors need to work closely with entrepreneurs, not only providing capital but also supporting business development through staged funding tied to transparent monitoring. Angel investors, venture capitalists, and institutional funders may need to rethink their expectations of scalability and exit strategies, particularly in models based on reuse, shared ownership, or service provision.

At the same time, investors themselves must be equipped with the knowledge to evaluate circular ventures effectively. Education, training, and exposure to demonstration cases are crucial for understanding which metrics matter in circular contexts and how to monitor them over time. Co-investment with public actors and engagement with impact-oriented investors or blended finance providers can further reduce risks, bridge knowledge gaps, and open new opportunities that align private capital with public objectives.

Implications for policymakers and regulators

Policymakers have a critical role to play in configuring the enabling environment for circular entrepreneurship. First, **integrated reporting frameworks** should be promoted that capture different forms of value creation – beyond financial return – including environmental regeneration, social inclusion, and resilience. This requires active engagement with accounting bodies, regulators, and investment institutions to reform how value is measured and disclosed.

Second, **policy instruments should support blended finance mechanisms** that allow public funds to leverage private investment. This could mirror successful models such as contracts for difference in the renewable energy sector, where government guarantees reduce investor risk and accelerate

market uptake. Tailored grant schemes, tax incentives for circular inputs, and guarantees for service-based revenue models can further lower entry barriers.

Third, **enabling regulatory environments** – such as sandboxes – should **be expanded** to allow experimentation with novel circular models. Policymakers should also support demand-side shifts, through green public procurement, consumer awareness campaigns, and measures that correct market externalities.

Finally, policymakers should **strengthen the support ecosystem** by investing in dedicated intermediaries – such as incubators, accelerators, circular hubs, and public innovation agencies. These actors assist circular start-ups in monitoring their impacts, quantifying financial and environmental savings, and translating these into investment-ready narratives. This support is crucial because, in practice, many entrepreneurs lack the resources to devote significant time to such activities, as the immediate pressure to generate profit prevails. To be effective, however, such intermediaries also need sufficient capacity and a solid understanding of circular principles and the specific logics and implications of circular business models. Ensuring that support actors themselves are well-equipped can ease the burden on start-ups while increasing investor confidence and improving capital access.

Implications for other ecosystem stakeholders

Beyond policymakers, a range of ecosystem actors play a complementary role in bridging circular start-ups and funding opportunities. Accelerators, incubators, circular hubs, and practitioner networks can amplify visibility, broker trust with funders, and build communities of practice (Van Opstal et al., 2025b). Established firms are equally important, both as early collaborators or customers and as providers of infrastructure, capital, and market access (Tuladhar et al., 2024). By actively engaging with start-ups, these stakeholders can accelerate the diffusion of circular models, demonstrate viable pathways to scale, and normalise new forms of value creation within industries.

5.5 Case study: PSS models

Product–Service Systems (PSS) represent a distinctive circular economy archetype where value is created through access and performance rather than ownership. They encompass a range of arrangements – leasing, sharing, pay-per-use, and performance-based contracting – that decouple economic value creation from linear throughput of materials by focusing on product functionality and prolonged use rather than ownership. As such, they hold substantial potential to reduce material extraction, extend product lifetimes, and promote repairability and reuse (Bocken et al., 2016; Tukker, 2015). Their potential for resource efficiency and lifecycle optimisation has been widely recognised, yet their financing remains a persistent bottleneck. In this thematic deep dive, we draw on academic and policy literature, as well as interviews conducted with practitioners and financial experts, to discuss their strategic relevance in this report, their specific barriers to funding, potential enablers, and implications for ecosystem stakeholders.

5.5.1 Funding PSS-models: a persistent challenge

The European Union formally recognises PSS models as eligible circular economy activities under its sustainable finance framework. Section 5.5 of the EU Taxonomy for Sustainable Activities includes “product-as-a-service and other circular use- and result-oriented service models” as one of the categories contributing substantially to the transition to a circular economy (EU, 2023b). To qualify, a PSS activity must meet specific criteria: the provider retains ownership of the physical product or asset; the contract includes obligations for maintenance, reuse, and take-back; the product is designed for durability, reparability, and traceability; and mechanisms are in place to monitor performance and use. These provisions are intended to ensure that the environmental benefits of circular use models

are not eroded by rebound effects, underutilisation, or premature disposal (Ackermann and Tunn, 2024; Zink and Geyer, 2017). Moreover, alignment with these criteria facilitates access to taxonomy-aligned financing instruments.

Despite this formal recognition, translating PSS business models into investable propositions remains challenging. The financial ecosystem is still largely calibrated to support conventional linear models based on one-off product sales, rather than service-based offerings with recurring revenue streams, longer payback periods, and more complex risk profiles (Kristensen and Remmen, 2019). In this respect, PSS models illustrate the broader issue of innovation-finance misalignment in circular economy transitions and justify a dedicated treatment in this report. In interviews conducted with practitioners and financial experts, PSS consistently emerged as a problematic category in terms of creditworthiness, asset valuation, and risk assessment – highlighting a structural gap between circular innovation and financial practice.

From a policy perspective, the inclusion of PSS in the EU Taxonomy underscores the need to accelerate institutional learning and financial adaptation. The European Investment Bank (EIB), for example, applies EU Taxonomy as a screening tool for project eligibility and requires project promoters to demonstrate ownership retention and lifecycle responsibility in PSS models. Yet, detailed guidance remains limited, and implementation challenges persist.

5.5.2 Explaining investment gaps for PSS-models

Barriers and challenges for funding PSS models can be found across both the supply and demand sides of finance and relate to structural misalignments between PSS business models and prevailing financial logics, as well as regulatory, accounting, and cultural frictions that constrain investment flows into service-based circular strategies.

Risk perception and asset ownership

A core structural challenge arises from the ownership model underpinning PSS: assets remain on the provider's balance sheet, often for extended periods. This implies not only a higher need for upfront capital, but also the transfer of operational, maintenance, and performance risks to the provider. From the financier's perspective, these models are perceived as riskier due to uncertainties around product longevity, residual value, user behaviour (e.g., misuse or overuse), and the ability to repossess or refurbish the asset at the end of the contract. These risks are amplified in business-to-consumer markets (e.g., electronics, mobility), where asset tracking and customer defaults are more difficult to manage. Financial institutions interviewed as part of this study noted that they often lack robust methods to assess these risk profiles or to evaluate the long-term value of service-based business propositions.

Cash flow and payback dynamics

PSS models fundamentally alter the cash flow structure compared to traditional sales. Revenues are typically spread over multi-year service contracts rather than realised in a single transaction. This creates delayed income streams and longer payback periods, which pose a particular barrier for start-ups and SMEs without substantial working capital reserves. For instance, Bundles – a Dutch circular start-up offering pay-per-wash services – required an upfront investment of approximately EUR 1,000 per washing machine, with a break-even point only after five to six years (Bauwens et al., 2020). For long-term assets, such as solar PV or heath pumps, this challenge is even bigger (Van Opstal and Smeets, 2023). Without a sufficient installed base of paid-off machines, every new customer generates new capital requirements, exerting pressure on liquidity and scalability. This financial risk may be

mitigated by pricing strategies that shorten the payback period, such as charging higher fees in the early years of the service. However, this may render the offer less competitive, especially in price-sensitive markets.

Valuation, accounting, and collateral constraints

Standard financial instruments are ill-suited to PSS models due to difficulties in asset valuation and collateralisation. For example, the retained asset may not qualify as a liquid or reliable form of collateral in credit assessments, particularly when it is used, distributed across customer locations, or subject to depreciation through shared use. Moreover, existing accounting standards may not adequately capture the long-term value of assets that remain productive through reuse, refurbishment, or modular upgrading. This impairs the ability of PSS providers to build favourable financial statements, attract debt finance, or meet investor expectations based on traditional profitability metrics. These issues are particularly salient for providers of environmentally friendly PSS-based products, which tend to require higher upfront investments in design, materials, research, and enabling infrastructure (Melati et al., 2021).

Customer-side frictions and cultural barriers

From a demand-side financing perspective, customers themselves may be unaccustomed or even resistant to service-based arrangements, especially in cultures where product ownership is closely linked to social status or perceived control. For public or corporate customers, leasing or pay-per-use models may conflict with procurement rules or long-standing budgeting practices that favour capital expenditures over operating expenditures. Moreover, for models that rely on end-customer financing (e.g., consumer leasing), creditworthiness and default risk become significant issues. Providers must then either screen customers more stringently or absorb the associated risk into their own financial structure – both of which raise the cost and complexity of service delivery.

Information asymmetry and unfamiliarity

Finally, there is a pronounced informational gap between PSS entrepreneurs and financiers. Financial institutions often lack familiarity with circular service models and are wary of funding propositions that deviate from conventional revenue structures. Similarly, many entrepreneurs are unfamiliar with how to articulate risk-return profiles in ways that resonate with funders. This mutual unfamiliarity reinforces a low-trust environment, in which potentially viable PSS businesses are deemed "unbankable" not due to intrinsic viability concerns, but due to limited financial language, lack of precedents, and underdeveloped financial ecosystems.

5.5.3 Solutions and enablers for PSS finance

Addressing the financing barriers faced by PSS models requires targeted enablers that mitigate the financial risks associated with service-based circular models but also help bridge the structural misalignments between PSS business logic and conventional finance. While no single solution is sufficient in isolation, a combination of mechanisms can enhance the investability of PSS models and reduce uncertainty among lenders and investors.

Tailored financing instruments and revenue models

New forms of finance that align with the cash flow and asset structure of PSS are beginning to emerge. These include subscription-based financing, asset-as-a-service contracts with built-in maintenance, and leasing models adapted to circular principles (e.g., including refurbishment obligations). Some

providers have adopted hybrid models that combine upfront deposits with lower monthly fees to improve liquidity while retaining service affordability. Special-purpose vehicles (SPVs) or financial intermediaries can also be used to manage asset ownership separately from service provision, thereby reducing balance sheet pressures on the PSS operator and offering investors more predictable collateral structures. This approach is already being explored by platforms bundling energy performance contracts or electronics-as-a-service (CEPS, 2021).

Insurance and guarantees as risk-mitigating tools

Insurance and guarantee instruments can play a vital role in addressing the operational risks and asset use uncertainties inherent in PSS. For example, tailored insurance products can protect providers against theft, damage, or misuse by customers, while credit insurance products and public or blended guarantee schemes can enhance creditworthiness for circular entrepreneurs lacking traditional collateral. The European Investment Bank (EIB) and national development banks increasingly explore such instruments within their sustainability financing programmes. In addition, warranty-backed service contracts and extended producer responsibility mechanisms can reinforce market confidence in asset durability and after-use value.

Public procurement and anchor client strategies

Governments and large institutional buyers can enable the scaling and bankability of PSS models by acting as early adopters or anchor clients. Public procurement frameworks that integrate service-based delivery, life-cycle costing, and performance contracting provide crucial demand-side signals and reduce market volatility. This is particularly relevant in sectors such as mobility, construction equipment, textiles, and electronics, where service contracts can be embedded in long-term framework agreements. EU procurement guidelines already encourage functional specifications and total cost of ownership approaches, although uptake remains uneven across Member States (EC, 2023a).

Policy frameworks and taxonomy alignment

The inclusion of PSS in the EU Taxonomy for Sustainable Activities represents a significant enabling development (EU, 2023b). By defining specific eligibility criteria – such as ownership retention, lifecycle monitoring, reparability, and contractual take-back obligations – the taxonomy provides both a benchmark for sustainable finance and a signalling mechanism for investors. Alignment with these criteria may unlock access to green loans, bonds, and taxonomy-compliant equity funding. Financial institutions interviewed for this study noted that clearer alignment with the taxonomy could help legitimise PSS propositions, especially when accompanied by credible monitoring and reporting standards.

Intermediaries and ecosystem support

A final class of enablers concerns the role of intermediaries in bridging the knowledge and coordination gaps in the financing ecosystem. Business support organisations, incubators, financial facilitators, and public-private platforms can assist PSS entrepreneurs in designing bankable business models, navigating financing instruments, and articulating their value proposition to investors. This is particularly important for start-ups that may lack financial literacy or networks to access appropriate capital. Some initiatives also pool demand across providers or geographies to reach viable scales for asset ownership or financing – for instance, through cooperative procurement or platform-based aggregation models.

5.5.4 Implications

Implications for entrepreneurs

Entrepreneurs developing PSS models must build financial strategies that reflect the distinct economics of asset ownership, delayed revenue, and longer payback periods. This includes robust lifecycle cost modelling, transparent risk allocation, and pricing mechanisms that balance affordability with financial sustainability. Start-ups and SMEs in particular face acute cash flow constraints and must consider how to manage capital intensity while scaling.

PSS entrepreneurs must also become more fluent in financial language and expectations. This means framing their propositions in terms that resonate with lenders and investors – highlighting predictable income streams, durability guarantees, and potential for asset re-use or resale. Clear articulation of circular value, coupled with alignment to recognised standards such as the EU Taxonomy, can improve investability. Engaging with incubators, financial facilitators, or ecosystem platforms may support this capability-building process.

Implications for financial institutions and investors

For funders, PSS models call for a rethinking of how value, risk, and viability are assessed. Conventional metrics based on one-off transactions and asset-light operations are often ill-suited to the realities of circular service-based models. Financial institutions must adapt their underwriting approaches to account for recurring revenue, long asset lifetimes, and intangible value elements such as customer retention or lifecycle performance guarantees. Doing so may involve integrating non-financial criteria, developing sector-specific benchmarks, or piloting new financial instruments tailored to PSS characteristics.

Institutional investors and impact financiers should also consider the opportunity side of PSS finance. In contexts, where sustainability regulation, carbon pricing, or procurement policies favour resource efficiency, PSS models may offer resilient, policy-aligned investment opportunities. Building internal capacity to evaluate such models – alongside risk mitigation via insurance, guarantees, or blended finance – could mobilise underutilised capital for circular innovation.

Implications for policymakers and regulators

Policymakers have a critical role in addressing the systemic barriers that impede PSS finance. First, this involves **improving regulatory clarity and consistency**, particularly in areas such as accounting standards, procurement rules, and tax treatment of leased or shared assets. For example, enabling operating expenditure (OPEX)-friendly procurement rules or incentivising take-back and reuse obligations can help align public demand with circular business models.

Second, the **integration of PSS into the EU Taxonomy** for Sustainable Activities should be operationalised through funding calls, public guarantee schemes, and capacity-building efforts. Clear eligibility criteria, robust monitoring frameworks, and accessible guidance for SMEs are necessary to ensure that taxonomy alignment translates into tangible funding opportunities. Moreover, public banks and funding agencies can lead by example, piloting dedicated PSS financial instruments or de-risking early market entrants.

Finally, public policy should support **market development through coordinated actions**: stimulating demand via green procurement, investing in infrastructure for reuse and refurbishment, and funding research into valuation methods and risk assessment tools tailored to PSS models.

Implications for intermediaries and ecosystem actors

Intermediaries – such as business support organisations, sectoral federations, and circular economy hubs – can play a convening and bridging role. They are well positioned to help entrepreneurs understand financial expectations, aggregate market intelligence, and connect actors across the financing value chain. Training programmes, matchmaking platforms, and knowledge-sharing events can improve ecosystem readiness and shorten the learning curve for both supply and demand sides of finance.

In addition, collective approaches such as cooperative asset ownership, platform-based service models, or shared investment vehicles may help overcome scale and capital access barriers. Intermediaries can catalyse such models by fostering collaboration, standardising contractual arrangements, and advocating for supportive regulatory frameworks.

5.6 Cumulative review of the analysis and discussions with concluding recommendations

Box 5.4: Chapter 5 Key Insights:

1. EU circular economy transition creates considerable financing demand, driven by regulation, corporate action, technology, social and market shifts.
2. Multifaceted differentiation of circular economy projects – e.g. according to circular and scaling strategies – calls for differentiated investment strategies and instruments.
3. A combination of policy interventions and support, innovative financing instruments and approaches, and stakeholder engagement or strategic cooperations are required for mobilising circular economy financing.
4. Difference in investment needs, financing barriers and enablers, and financial instruments stems also from different circular finance business models, as illustrated by circular start-ups and PSS case studies.
5. A common bottom-line, however, is the necessity of an unconventional risk assessment model development.

- **EU circular economy goals demand significant additional annual capital flows.** Meeting these targets requires EUR 82 billion in extra investment each year until 2040, amounting to EUR 1.2 trillion in total, according to EIB-EC (EIB-EC, 2026).
- **New capital demand for the circular economy is driven by regulation, corporate action, technology, and consumer shifts.** Specific examples include the EU Taxonomy and CEAP, ESG-linked investor expectations, AI-based residual value tools, and rising consumer engagement. These drivers are jointly reshaping both the volume and structure of required investments. For example, taxonomy-aligned disclosure rules are pushing banks to design new circular economy loan products, while digital asset-tracking technologies enable lenders to value previously illiquid recycled-material inventories.
- **Circular strategies carry distinct risk-return profiles, each challenging conventional finance.** Recycling and recovery demand high upfront infrastructure spending, reuse and PSS models face delayed revenues and collateral limits, eco-design often needs patient capital for uncertain returns, and sufficiency models grow slowly and rely on alternative funding. In other words: there is no such thing as a one-size-fits-all “green finance” instrument that will fit all circular economy strategies.

- **Scaling pathways dictate different financing requirements and instruments.** Scaling out (replication) needs flexible, locally adapted finance, scaling up (systemic transformation) requires large, blended capital flows and systemic integration into mainstream markets, and scaling deep (embedding behavioural change) depends on cultural and institutional change in finance and long-term trust between actors. For instance, scaling up modular construction for a circular economy requires guarantees across an entire supply chain, while scaling deep may involve multi-year community investment programmes.
- **Market failures and linear lock-ins constrain capital flows.** Information asymmetries, unpriced externalities, split incentives, incomplete markets for secondary materials, and deeply embedded linear financial norms distort risk perception and result in an under-allocation of funding to circular economy initiatives.
- **Innovative financing models can align capital supply with implementing and scaling circular economy strategies.** Blended finance, contract-based revenue securitisation, results-based loans, circular economy-specific bonds and funds, fintech-enabled risk tools, and place-based green bonds can link returns more directly to circular performance.
- **Circular start-ups expose systemic misalignment in early-stage finance.** High capital needs, disruptive business models, and long payback horizons require targeted public de-risking, procurement commitments by established firms or public bodies, regulatory sandboxes, and mission-aligned capital to progress beyond pilot stage. For example, when a local authority guarantees multi-year service contracts for a reuse start-up, it provides revenue certainty that can trigger private investment.
- **PSS models illustrate the financing gap for service-based circular systems.** Asset retention, delayed revenues, and complex risk profiles demand tools such as Special Purpose Vehicles (SPVs), guarantee schemes, lifecycle-linked procurement, taxonomy-aligned credit lines, and intermediary-led market aggregation. For example, creating a SPV to hold and manage leased assets can remove them from the provider's balance sheet, improving liquidity and making the business more attractive to lenders.

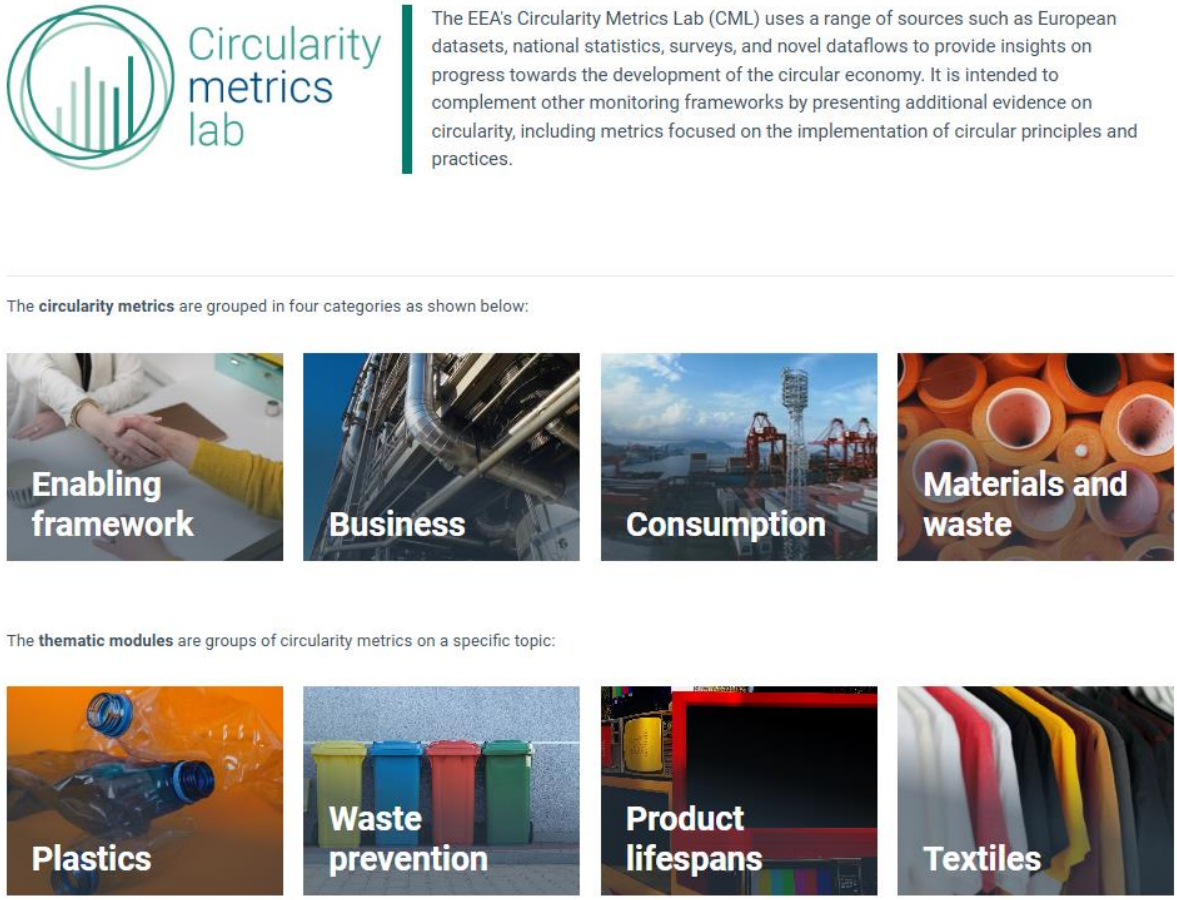
6 Towards improved metrics for the Circularity Metrics Lab

This chapter outlines how the **Circularity Metrics Lab (CML)** of the European Environment Agency (EEA) can be enhanced to better monitor financial flows in the circular economy. It first outlines the current role of the CML and discusses the relevance of existing metrics to the financial ecosystem of the circular economy. Next, it describes the principles and criteria that guide future development of the CML. Subsequently, it identifies opportunities to refine current indicators, integrate new policy-driven and private sector data, and adopt innovative analytical methods. It concludes with a phased roadmap for implementation and an initial assessment of proposed metrics.

6.1 The Circularity Metrics Lab

The CML – depicted in Figure 6.1 – is an initiative designed to complement existing monitoring frameworks on Europe's transition to a circular economy, such as the European Commission's Circular Economy Monitoring Framework. While current frameworks provide insights into macro-level material flows, resource supply, and waste generation, they tend to underrepresent other critical aspects of circularity, particularly those where data streams are fragmented or incomplete (EEA, 2024b). The CML addresses this gap by integrating novel data sources and adopting a broader analytical lens.

Figure 6.1: The Circular Metrics Lab homepage



Source: The Circularity Metrics Lab webpage (EEA, 2024b)

The "Lab" aspect reflects its role as a flexible, exploratory platform for testing, refining, and curating a diverse set of metrics. These metrics fall into two main categories: **Indicators** – well-established, EU-

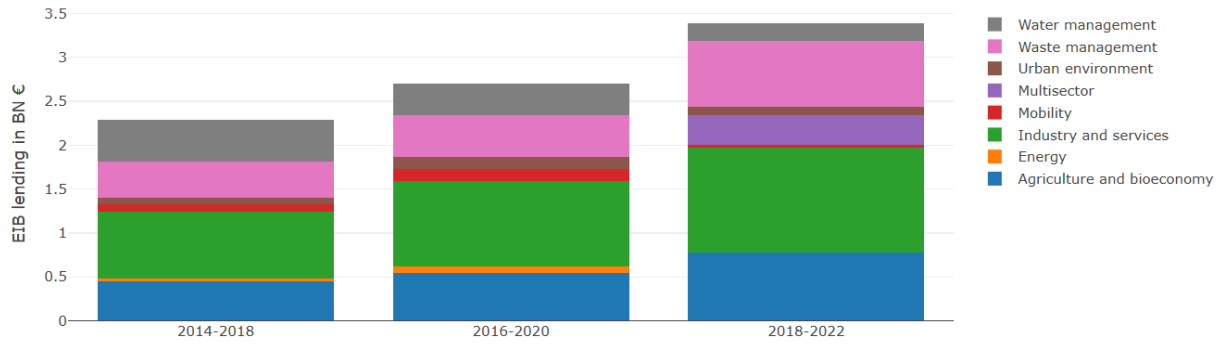
wide datasets with high reliability – and **Signals**, which are less comprehensive but provide timely and valuable insights, often drawing from scientific studies, surveys, or country-level datasets. This mixed approach enables the CML to capture both the structural trends of circularity and emerging developments that might otherwise be overlooked in official statistics (EEA, 2024b).

Structurally, the CML operates through a four-part framework. First, it identifies enabling factors – policy, economic, and infrastructural conditions – that support the expansion of the circular economy. Second, it monitors adoption by businesses, capturing the spread of circular business models, technological uptake, and market readiness. Third, it analyses household-level behaviour, including consumption practices and participation in reuse, repair, and sharing initiatives. Finally, it tracks waste and material flow dynamics, focusing on trends in material circularity, recycling rates, and waste prevention. These thematic modules can also address sector-specific priorities, such as plastics and textiles, where circularity interventions can reduce environmental pressures (EEA, 2024b).

6.2 Current CML metrics for circular economy finance

A diverse set of indicators and signals is tracked by the CML to provide a multi-dimensional picture of progress towards a circular economy in Europe. The CML includes a **circular economy lending indicator**, quantifying the total co-financing provided by the European Investment Bank (EIB) for circular economy projects, expressed in billions of euros (see Figure 6.2). The EIB compiles these figures through its investment tracking process, with results published in the *Annual Circular Economy Overview* since 2020. The available data are presented as five-year aggregates, covering the period from 2014 to 2022 for the EU-27 (EEA, 2024b).

Figure 6.2: Circular economy lending by the EIB (EU Member States 2014-2022)



Source: The Circularity Metrics Lab webpage (EEA, 2024b)

While other data points in the CML do not directly relate to circular economy finance, they offer useful contextual evidence when assessing circular economy finance, providing background information on the regulatory and institutional environment. They can inform regulatory foresight, identifying areas likely to be affected by new product-design obligations, and may support the development of engagement priorities for investors and lenders (EEA, 2024b).

Metrics related to **businesses** highlight the market uptake of circular business models, innovation capacity, and labour-market effects. For finance, they can guide opportunity screening (identifying investable firms or supply chains), inform revenue and cost resilience analysis, and support just transition reporting under the SFDR and the CSRD. Metrics related to **consumption** provide a lens on behavioural change, service-based circular models, and high-impact consumption. The financial ecosystem can use such data to evaluate market dynamics in reuse, repair, and sharing services.

Furthermore, the CML includes data **materials and waste**. For finance, these metrics are useful for transition and supply-chain risk analysis. They may also serve as key performance indicators for portfolio alignment with EU resource efficiency and climate objectives. Furthermore, **thematic modules** of the CML provide sector-specific granularity no plastics and textiles, as well as a module on waste prevention and on product lifespans (EEA, 2024b).

A core priority for the further development of the CML is the refinement and harmonisation of existing circular economy indicators. Before expanding the indicator set, it is important to explore which established project, programme, and Member State indicators provide a reliable basis for monitoring circular economy finance. Existing data streams from EUROSTAT, national reporting, and EU funding instruments already offer structured information that can be strengthened through improved disaggregation, clearer definitions, and consistent classification. This approach supports comparability across Member States and avoids the risk of indicator proliferation.

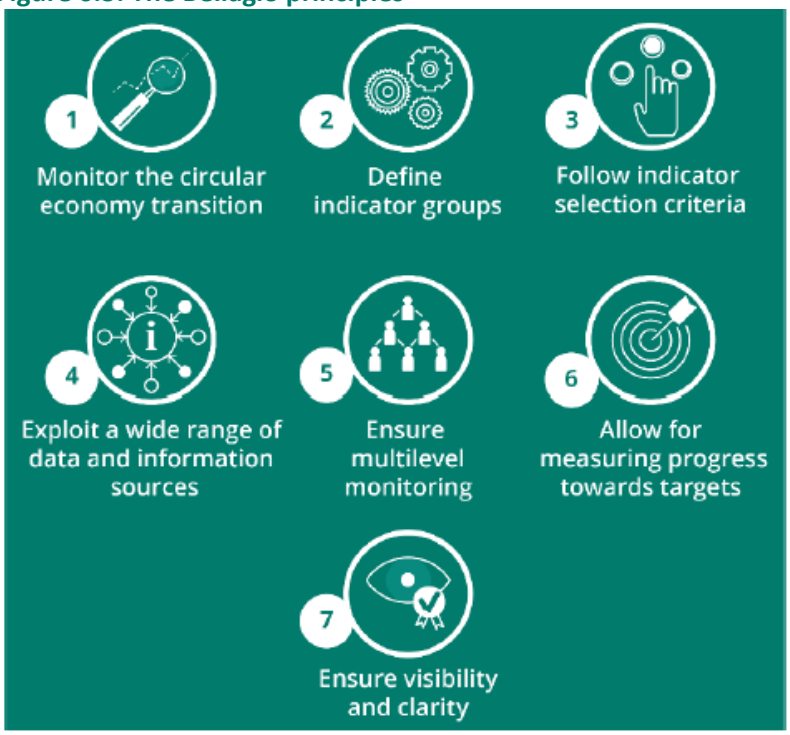
6.3 Criteria and principles for new CML indicators

The development of new CML indicators should be guided by well-established principles and quality criteria that ensure they are scientifically robust, policy-relevant, and capable of supporting effective decision-making. Therefore, we shortly introduce and discuss the Bellagio principles and RACER criteria, which have been applied to guide the selection of CML indicators.

6.3.1 The Bellagio principles

The Bellagio principles (see Figure 6.3) serve as a framework for guiding sustainability assessment, and are designed to help governments, international organisations, and other actors develop and use indicators that could meaningfully inform decision-making. Today, they are widely recognised as a benchmark for the design of indicator systems that integrate environmental, social, and economic dimensions in a coherent and policy-relevant way (EEA and ISPRA, 2020).

Figure 6.3: The Bellagio principles



Source: (EEA and ISPRA, 2020).

The Bellagio principles originate from a 1996 meeting of sustainability experts convened by the International Institute for Sustainable Development (IISD) in Bellagio, Italy. This gathering brought together practitioners, researchers, and policymakers to address the growing need for robust methods to assess progress towards sustainable development. At the time, sustainable development had been firmly established as a global policy goal following the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, but there was no shared framework for translating this ambition into measurable progress. These principles were updated in 2011 to reflect emerging insights from practice, incorporating stronger emphasis on participation, transparency, and adaptive learning.

Applied to the CML, the Bellagio principles provide a conceptual anchor for ensuring that new indicators are both scientifically sound and practically useful. They emphasise that any indicator framework must be anchored in a clear vision of sustainable development, supported by explicit goals and targets. A systems perspective is central to the Bellagio principles. Indicators should reflect the interconnections between environmental, social, and economic dimensions of the circular economy, as well as the links between different spatial and temporal scales. In practice, this means that new CML indicators need to account for feedback loops, synergies, and trade-offs between different aspects of circularity, such as waste prevention, material efficiency, innovation, and employment effects.

The principles also highlight the importance of openness, transparency, and effective communication. All new indicators should be accompanied by clear documentation of definitions, data sources, assumptions, and limitations. This transparency supports reproducibility and strengthens user confidence in the metrics. Communication should focus on making results accessible to a broad range of stakeholders, including policymakers, financial institutions, industry, and civil society. Finally, the Bellagio principles call for broad participation and continued learning. The CML should involve relevant stakeholders in the development and review of indicators to ensure their legitimacy and usability. Furthermore, indicators must be designed to evolve over time, adapting to new scientific insights, data availability, and policy priorities. Periodic reviews will help identify where indicators require refinement or replacement to maintain their relevance.

6.3.2 RACER criteria

Alongside the Bellagio principles, the RACER framework offers a practical set of quality requirements for indicator development. RACER stands for Relevant, Accepted, Credible, Easy, and Robust, and each element contributes to ensuring that indicators are fit for policy purposes.

- **Relevance** refers to the capacity of the indicator to address key aspects of the policy issue it is intended to monitor. In the CML context, this means that each indicator should capture a dimension of circularity that is critical for tracking enabling conditions, business adoption, consumer behaviour, or material and waste flows.
- **Acceptance** relates to the degree to which stakeholders agree on the importance and validity of the indicator. For the CML, ensuring acceptance requires consultation with policymakers, statistical agencies, industry, and civil society to build consensus on the value and use of the metric.
- **Credibility** depends on the scientific soundness and methodological rigour of the indicator. Data sources and methods should be well-documented, consistent with international standards where applicable, and open to independent verification.
- **Ease** refers to the practicality of collecting, compiling, and interpreting the indicator. For the CML, indicators should avoid excessive data demands, make use of existing statistical

frameworks where possible, and present results in a format that is straightforward for target audiences to understand.

- **Robustness** concerns the reliability and stability of the indicator over time, ensuring that results are not unduly affected by methodological changes or data anomalies. Robust indicators allow for meaningful trend analysis and provide a dependable basis for policy evaluation.

The RACER criteria were developed by the European Commission to assess and design effective performance indicators for policy monitoring and evaluation. The RACER-criteria were considered as the criteria to be used by the Bellagio principles (ISPRA and EEA, 2020). These criteria were used consistently from 2021 onwards in the ETC CE tasks related to the Circularity Metrics Lab.

When presenting indicators, it is essential to make explicit what each indicator measures and what it does not capture. This includes clarifying the level of aggregation, the underlying assumptions, and the aspects of circularity that remain outside the scope of measurement. Such transparency improves interpretability for users, aligns with the Bellagio and RACER principles, and helps avoid misinterpretation of the indicators' relevance to circular economy finance.

6.4 Promising data sources and methods to build new indicators

Now, we identify and evaluate promising data sources and methodological approaches that could enhance the CML to monitor financial flows into the circular economy.

6.4.1 Refinement of existing CML metrics

The current CML finance-related indicator on **circular economy lending** draws on EIB data and expresses the **total co-financing for circular economy projects over multi-year periods.** As reported in the CML, the most recent value is EUR 3.4 billion for the EU-27 in the period 2018–2022, with earlier aggregates available for 2014-2018 and 2016-2020. The indicator page notes broad changes in the distribution of lending across three categories – industry and services, waste management, and water management – but does not present geographic or detailed temporal breakdowns (EEA, 2024b).

Evidence from the *Circular Economy Overview 2024* (EIB, 2024) and related publications demonstrates that more granular information is available. The EIB also reports annual lending volumes and provides project-level data that includes country and sector attributes through its open data portal. This confirms that enhanced disaggregation by Member State and over time is feasible using existing data sources.

Furthermore, qualitative dimensions could also be incorporated to address current limitations in understanding the nature of financed projects. A useful reference point is the *Suggested Impact Reporting Metrics for Circular Economy and/or Eco-Efficient Projects* developed by ICMA's Green Bond Principles Impact Reporting Working Group (ICMA, 2021b). These metrics are not an EU-specific database, but a voluntary reporting framework that guides issuers of green and sustainable bonds in disclosing project impacts. The framework recommends both quantitative indicators – such as tonnes of recycled material, the share of products designed for reuse or recycling, and efficiency gains in energy or water use – and qualitative disclosures that describe methodologies, baseline values, and the specific circular strategies supported. At present, these metrics rely heavily on narrative descriptions. Embedding them in structured classification frameworks would make it possible to turn qualitative information into more comparable and policy-relevant data points. Other frameworks similarly provide relevant metrics aimed at informing finance actors. Examples include the EU Taxonomy, the IFC Harmonised Guidelines, the Urban Agenda Partnership for Circular Economy (in

collaboration with the EIB), and the WBCSD's framework indicators for transitioning to a circular economy. A parallel analysis of these frameworks would strengthen the basis for identifying indicators that make circular economy contributions more visible within sustainable finance.

Among project level indicators, the *Circular Material Use Rate* (CMUR) represents an established and widely used measure of material efficiency. While CMUR currently features mainly in macro level circular economy monitoring, it could serve as a relevant reference point for assessing project outcomes funded through circular economy finance instruments. Incorporating CMUR where appropriate would anchor project level assessments in a familiar metric and support consistency with broader EU monitoring frameworks.

Box 6.1: Refining of the CML indicator

Building on the evidence considered above, the CML indicator could be refined in several ways:

1. The CML could present **lending volumes on an annual basis rather than aggregated over several years**. This would make it easier to identify changes over time and to respond more quickly to policy developments.
2. The CML could incorporate the **full sectoral categorisation** of the EIB in order to monitor finance flows into specific circular economy domains in greater detail, while noting that the EIB's representation of circular economy finance volumes has evolved over time.
3. **Lending data could be shown by Member State or at NUTS-2 regional level** to facilitate regional benchmarking and assess alignment with cohesion policy objectives.
4. Projects could be classified by type of **circular business model**, drawing on project descriptions and established taxonomies, so that investment patterns in different business model archetypes can be tracked.
5. Absolute lending volumes could be **complemented with proportional measures**, such as the share of total EIB lending or the share relative to GDP, to provide insight into the scale of circular investment efforts.

This work would allow to analyse lending data alongside other enabling framework metrics in the CML, such as the presence of national circular economy policies, the uptake of green public procurement, or the existing of green budgeting or green bonds, to identify potential synergies or gaps in enabling conditions.

6.4.2 European and international policy-driven data

Several emerging EU regulatory and advisory frameworks offer the potential for structured, high-coverage datasets on circular economy finance. The **Platform on Sustainable Finance (PSF)** has begun publishing estimates of current investment levels relative to EU Green Deal needs, using the **EU Taxonomy** as its methodological basis. Its *Monitoring Capital Flows to Sustainable Investments* report (PSF, 2025b) includes preliminary circular economy investment figures, which could be incorporated into CML indicators once methodological refinements and disaggregation improve their reliability. This should be available in the following years.

The **Corporate Sustainability Reporting Directive (CSRD)** and the associated **European Sustainability Reporting Standards (ESRS)** provide a promising medium-term data source. ESRS E5-6 requires disclosure of the anticipated financial effects of resource use strategies, in both qualitative and quantitative terms. While time-series data will only become available after several reporting cycles, the standardised nature of ESRS disclosures offers strong potential for benchmarking corporate

circularity-related financial outcomes. Advances in text analytics and large language models could facilitate automated extraction and classification of circular economy-related disclosures from company reports, enabling systematic monitoring of uptake and impacts.

The **Sustainable Finance Disclosure Regulation (SFDR)** also generates relevant data, particularly through its **Principal Adverse Impacts (PAI)** statements submitted to financial supervisors such as ESMA and its Member State counterparts. If access protocols and data formatting allow, these disclosures could be used to monitor the impacts of the activities funded across financial products and to track whether portfolios increasingly take circular strategies into account over time. However, it should be noted that such indicators are not express in monetary terms: for example, the non-recycled waste ratio measures tonnes of non-recycled waste per million euros invested as a weighted average. Similarly, the **EU Green Asset Ratio (GAR)** – the proportion of a financial institution's assets aligned with the EU Taxonomy – is a directly measurable KPI that, once disaggregated by Taxonomy objective, could serve as a proxy for circular economy-aligned finance in the banking sector, even if it does not directly indicate how much money is invested in circular activities.

Finally, **financial ecolabels**, as recorded in EU and national schemes, could in principle serve as a count-based indicator: tracking the number and share of labels awarded to products or funds meeting circularity criteria over time would offer a proxy for market uptake. However, the feasibility of such an indicator depends on data accessibility. At present, there is no single centralised database that consolidates ecolabel awards across countries and schemes. Without such a source, constructing a robust and comprehensive indicator would require considerable effort in collating information from multiple national and EU-level registries.

6.4.3 Private sector and financial market data

Commercial financial databases and project registries, when combined with EU Taxonomy alignment data, could offer potential to track capital flows into circular economy projects at the level of level of individual financing transactions, such as specific loans, bond issuances, or equity investments targeted at circular economy projects.

As noted in the literature, financiers face persistent challenges in assessing the bankability of circular business models due to insufficient asset valuation methodologies, especially for intangible-heavy enterprises (de la Cuesta-González and Morales-García, 2022). Methodological innovation in asset valuation is therefore central to indicator development. AI-driven tools for estimating residual values of circular assets (Fallahi et al., 2023) can enhance the objectivity of collateral valuation in sectors such as remanufacturing or leasing-based models, and these valuations could themselves form part of a performance indicator on circular asset finance readiness At the same time, it is important to acknowledge that the use of AI in financial asset valuation raises ethical and governance risks, including transparency and accountability. Any application of such tools in indicator development would therefore need to be accompanied by safeguards to ensure reliability and responsible use.

Another methodological possibility has been applied in the *Circularity Gap Report Finance*. It is based on **deal-level investment data**, allowing a bottom-up estimation of financial flows (Circle Economy, 2025a). Rather than relying on aggregate or regulatory reporting, it compiles individual financing transactions to provide a more accurate picture of where capital is flowing, which financial instruments are being used, and which circular business models are being supported. For the CML, this approach suggests a valuable extension: piloting the integration of commercial financial databases such as PitchBook, Refinitiv, or Crunchbase to monitor circular economy-related deals across Europe. Moreover, it allows us to make a distinction between investments in circular business models and

transition finance, defined as capital raised by linear businesses to support their shift towards circularity.

6.4.4 Innovative analytical methods

The next generation of circular economy finance indicators can benefit from methodological advances to address data gaps and qualitative dimensions. Natural language processing (NLP) and large language models (LLM) can be deployed to scan corporate reports, PAI statements, and green bond documentation for evidence of circular strategies, thereby enabling scalable and repeatable text analysis. However, such approaches presuppose the existence of consistent and agreed classifications, which require prior deliberation among experts and stakeholders. Once such a framework is in place, NLP and LLM tools can operationalise it at scale.

Similarly, AI-enhanced image recognition and market price modelling could, in principle, support standardised valuation of second-hand and remanufactured assets, thereby addressing current "hard-to-value" inventory challenges in credit risk assessments. Yet the practical application of image recognition is constrained by the need for very large, well-labelled photo databases, which do not currently exist for many categories of circular assets. Where textual information is available, an alternative could be to combine market price modelling with large language model–based classification of product descriptions, offering a more feasible pathway in the near term.

Keskin and Esen (2024) demonstrate in the banking sector how integrated reports can be systematically analysed using data analytics models to assess both thematic content and readability of environmental disclosures. Applying a similar approach to circular economy reporting could allow the CML to track whether circular economy strategies of companies are being communicated in a clear, accessible, and consistent manner over time. By identifying how often and how extensively circular economy themes appear in reports, and by tracking changes in readability scores, the CML could create meta-indicators that show how clearly companies communicate their circular strategies and how well these disclosures support stakeholder engagement and cross-sector comparisons.

6.4.5 Towards a roadmap for integration into the CML

In operational terms, only a phased integration of these data sources into the CML would be feasible.

Short-term priorities could include refining existing CML metrics, particularly the EIB circular lending indicator, and piloting EU Green Asset Ratio disaggregation alongside initial natural language processing-based scanning of voluntary disclosures. This would require close collaboration with parties who hold detailed reporting data, such as ESMA, national financial authorities, or sustainability funds. Note however that these approaches may create substantial technical dependencies, requiring infrastructure and expertise, and compatibility with the existing systems behind the CML. A pragmatic approach may therefore be to prioritise the technical set-up and small-scale demonstrations using limited data before attempting to establish a fully-fledged indicator solution. This phased development would allow testing, adaptation, and confidence-building while gradually addressing dependencies on external data access.

Medium-term priorities could focus on embedding ESRS- and SFDR-derived indicators once time series data becomes available, and on testing the feasibility of incorporating AI-driven asset valuation into metrics for bankability and risk profiling. **Longer-term ambitions** could involve linking financial flow data with outcome indicators on environmental and socio-economic impacts, ensuring that CML metrics capture not only the scale but also the effectiveness and justice dimensions of circular economy finance.

In sum, we also summarise our findings in relation to the RACER criteria, as reported in Table 6.1.

Table 6.1: CML pathways for improved metrics on circular economy finance

Proposed CML metric	Relevant	Accepted	Credible	Easy	Robust
Annual disaggregated EIB circular lending data by country and sector	High	High	High	High	High
Classification of EIB-financed projects by circular business model archetype	High	Medium	Medium	Low	Medium
Share of EIB lending to CE relative to total EIB lending or GDP	High	High	High	High	High
ESRS E5-6 corporate disclosure analysis using NLP	High	Medium	Medium	Medium	Medium
SFDR Principal Adverse Impacts (PAI) circular economy investment tracking	High	Medium	Medium	Low	Medium
Disaggregated EU Green Asset Ratio by Taxonomy objective	High	High	High	Low	High
Count of financial products/funds with CE-aligned ecolabels	Medium	Medium	Medium	High	Medium
AI-driven residual value estimates for circular assets	High	Medium	Medium	Low	Medium
Integrated reporting thematic and readability meta-indicators	Medium	Medium	Medium	Low	Medium
Deal-level tracking of CE-related investments from commercial databases	High	Medium	Medium	Medium	Medium

Source: elaboration by the authors (VITO)

List of abbreviations

Abbreviation	Name	Reference
AI	Artificial Intelligence	
BAFU	Swiss Environment Protection Agency	Federal Office for the Environment - Homepage
bn	billion	
CAP	Common Agriculture Policy	CAP at a glance - Agriculture and rural development - European Commission
CapEx	Capital Expenditures	
CE	Circular Economy	Circular economy: definition, importance and benefits | Topics | European Parliament
CEAP	EU Circular Economy Action Plan	Circular Economy - Environment - European Commission
CGT	EU-China bilateral Common Ground Taxonomy	The International Platform on Sustainable Finance presents the Multi-Jurisdiction Common Ground Taxonomy to enhance interoperability of taxonomies across EU, China and Singapore
CML	Circularity Metrics Lab	Circularity Metrics Lab (EEA)
CMUR	Circular Material Use Rate	Circular material use rate in Europe | Indicators | European Environment Agency (EEA)
CSDDD	Corporate Sustainability Due Diligence Directive	Corporate sustainability due diligence - European Commission
CSRD	Corporate Sustainability Reporting Directive	Corporate sustainability reporting - Finance - European Commission
DACH	Germany, Austria, and Switzerland	
DFI	Development Financial Institution	
DG ENV	European Commission Directorate-General for Environment	Environment - European Commission
DNB	Dutch National Bank	De Nederlandsche Bank (DNB) – the central bank of the Netherlands
DR	Disclosure Requirements	
EAFRD	European Agricultural Fund for Rural Development	European Agricultural Fund for Rural Development (EAFRD) - European Commission
EBA	European Banking Authority	Homepage | European Banking Authority
EBRD	European Bank for Reconstruction and Development	Home
EC	European Commission	European Commission, official website - European Commission
ECB	European Central Bank	European Central Bank
EEA	European Environment Agency	www.eea.europa.eu
EEE	Electrical and electronic equipment	

EFRAG	European Financial Reporting Advisory Group	Europe's Voice in Corporate Reporting | EFRAG
EGD	European Green Deal	The European Green Deal - European Commission
EIB	European Investment Bank	Homepage | European Investment Bank
EMFAF	European Maritime, Fisheries and Aquaculture Fund	EMFAF - Oceans and fisheries - European Commission
EPR	Extended Producer Responsibility	
ERDF	European Regional Development Fund	European Regional Development Fund (ERDF) - European Commission
ESAP	European Single Access Point	European single access point | EUR-Lex
ESG	Environmental, Social and Governance	
ESMA	European Securities and Markets Authority	| European Securities and Markets Authority
ESPR	Ecodesign for Sustainable Products Regulation	Ecodesign for Sustainable Products Regulation - European Commission
ESRS	European Sustainability Reporting Standards	The Commission adopts the European Sustainability Reporting Standards - Finance
ETC	European Topic Centre	About European Topic Centres — Eionet Portal
ETC CE	European Topic Centre on Circular Economy and Resource Use	ETC Circular economy and resource use (ETC CE) — Eionet Portal
ETC ST	European Topic Centre on Sustainability Transitions	ETC Sustainability Transitions (ETC ST) — Eionet Portal
EU	European Union	
EU CEMF	EU Circular Economy Monitoring Framework	Monitoring Framework for the circular economy - European Commission
EuGB	European Green Bond Standard	European green bond standard | EUR-Lex
EUROSTAT	EU Statistics and Data	Home - Eurostat
GAR	Green Asset Ratio	
GBP	Green Bond Principles	Green Bond Principles » ICMA
GDP	Gross Domestic Product	
ICER	Integral Circular Economy Report (in NL)	
ICMA	International Capital Market Association	The International Capital Market Association » ICMA
ICT	Information and Communication Tehcnology	
IFC	International Finance Corporation (part of the World Bank Group)	International Finance Corporation (IFC)
IPSF	International Platform on Sustainable Finance	International Platform on Sustainable Finance - Finance
ISIC	International Standard Industrial Classification	UNSD — ISIC

ISO	International Standardisation Organisation	ISO - Standards
JICE	Joint Initiative on Circular Economy	The Joint Initiative on Circular Economy (JICE) | Circular Cities and Regions Initiative
JTI	Just Transition Fund	Just Transition Fund - European Commission
KfW	Kreditanstalt für Wiederbau (German Development Bank)	Bank aus Verantwortung | KfW
KPI	Key Performance Indicator	
LLM	Large language models	
LMA	Loan Market Association	Loan Market Association - the authoritative voice of the EMEA market
LSFI	Luxembourg Sustainable Finance Initiative	Home - LSFI
m	million	
MFF	Multiannual Financial Framework	EU budget 2028-2034
MDB	Multilateral Development Bank	
MDB CE WG	MDBs working group for circular economy	Multilateral Development Banks present their Working Group's emerging shared vision for circular economy at WCEF 2024
MSWM	municipal solid waste management	
MVP	minimum viable product	
NACE	"Nomenclature statistique des activités économiques dans la Communauté européenne" statistical classification of economic activities in the European Community	NACE - Data Collection Framework - DCF - European Commission
NFRD	Non-Financial Reporting Directive	Directive - 2014/95 - EN - NFRD - EUR-Lex
NGEU	Next Generation EU programme	NextGenerationEU - European Commission
NGFS	Network of Central Banks and Supervisory for Greening the Financial System	Welcome to the NGFS website | Network for Greening the Financial System
NLP	Natural language processing	
NPCE	National Circular Economy Program 2023-2030 (NL)	
OECD	Organisation for Economic Cooperation and Development	The Organisation for Economic Co-operation and Development | OECD
OpEx	Operational Expenditures	
PA	Paris Agreement	The Paris Agreement | UNFCCC
PAI	Principal Adverse Impacts	
PPP	Polluter Pays Principle	
PSF	Platform on Sustainable Finance	Platform on Sustainable Finance - Finance - European Commission
PSS	Product–Service Systems	

RACER	Relevant, Accepted, Credible, Easy, and Robust	
R&D	Research and Development	
RRF	Recovery and Resilience Facility	Recovery and Resilience Facility - European Commission
RTI	Circular Economy Research, Technology and Innovation	
RTS	Regulatory Technical Standards	Regulatory Technical Standards package on compliance of institutions and supervisors with their AML/CFT obligations | European Banking Authority
SBG	Sustainability Bond Guidelines	Sustainability Bond Guidelines (SBG) » ICMA
SBP	Social Bond Principles	Social Bond Principles (SBP) » ICMA
SDG	Sustainability Development Goals	THE 17 GOALS | Sustainable Development
SFDR	Sustainable Finance Disclosure Regulation	Regulation - 2019/2088 - EN - sfdr - EUR-Lex
SLBP	Sustainability-Linked Bond Principles	Sustainability-Linked Bond Principles (SLBP) » ICMA
SME	Small and medium-sized enterprises	SME definition - Internal Market, Industry, Entrepreneurship and SMEs
SPV	Special purpose vehicle	
UNEP FI	United Nations Environment Programme Finance Initiative	United Nations Environment – Finance Initiative – Partnership between United Nations Environment and the global financial sector to promote sustainable finance
UoP	Use of Proceeds	
WBG	World Bank Group	World Bank Group - International Development, Poverty and Sustainability
WBCSD	World Business Counsil for Sustainable Development	The World Business Council for Sustainable Development (WBCSD)

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Annex 1. Interviews Information

List of interviews:

Date	Duration	Institution
09.04.2025	1.5h	EIB (European Investment Bank)
29.04.2025	1h	EIB (European Investment Bank (additional experts))
08.05.2025	1.5h	UNEP FI (UNITED NATIONS ENVIRONMENT PROGRAMME FINANCE INITIATIVE)
23.06.2025	1h	DNB (Dutch National Bank)
30.06.2025	1.5h	BAFU (Swiss Federal Office of Environment)

The following general questions were discussed during the interviews:

- From the point of view of finance and from your experience: how is CE defined in terms of strategies, key product value chains, sectors, criteria?
- Do you in your work, dealing with CE finance, apply the EU Sustainable Finance tools, standards, regulations? Which of them? How effective are those or what is missing?
- What is the role of leading finance market players (multilateral development banks)/networks/alliances in developing a common approach to CE financing and how does it relate to different CE strategies?
- Which other strategies/criteria/approaches for CE financing are available (European scope, not discussed in the previous questions) and how do they relate to the overview of CE definitions?
- Which methodologies for assessing the CE finance needs do you know or do you work with? What is your approach to estimating the volume of CE finance/investment? What can be improved in respect of methodologies or metrics?
- What are the tendencies and trends for CE financing observed?
- What are the barriers and enablers for CE financing observed?