JUST2CE

A Just Transition to Circular Economy

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CHAPTER 22

Circular economy transition in European Union countries

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Abstract

The Circular Economy (CE) stands out as a focal point within the developmental agenda of the European Union (EU) and constitutes an integral component of the EU's overarching industrial strategy. Positioned as an indispensable element, the transition towards a more circular economy represents a crucial contribution to the EU's endeavours in fostering a sustainable, low-carbon, resource-efficient, and competitive economic landscape. The concept of CE gained considerable prominence in Europe following its incorporation into EU policy and strategy in 2014, underscored by the introduction of Circular Economy Action Plans by the European Commission in 2015 and 2020.

In the past decade, the Circular Economy has garnered heightened attention, propelled by the challenges outlined in the Circular Economy Action Plans. Member States have undertaken substantial efforts to recalibrate their social and economic activities towards embracing circularity, resulting in transformative shifts characterized by the emergence of novel business models and opportunities. This comprehensive analysis delves into the initiatives, policies, and programs related to the CE across all European countries. Particular emphasis is placed on scrutinizing national recovery plans and various initiatives within the purview of the Just Transition framework. By exploring these facets, the study aims to offer a nuanced understanding of the diverse approaches and strategies adopted by EU member states in navigating the landscape of CE, shedding light on the intricate interplay between policy frameworks, national recovery plans, and the broader framework of just transition.

Keywords: Circular economy, European Union, Just transition, Member States.

This chapter endeavours to elucidate the diverse array of instruments and models utilized across various European countries. A comprehensive analysis of these nations will be conducted, shedding light on significant nuances and distinctions.

22.1 Introduction

The CE is an economic model crafted to eliminate waste by design and optimize resource usage. It encompasses practices such as reducing, reusing, recycling, and recovering materials to establish a closed-loop system. The EU

has been at the forefront of promoting the CE, implementing strategies and initiatives aimed at fostering sustainability, resource efficiency, and environmental protection.

The literature, as well as the EU directive and recommendations, consistently highlight that most of the challenges related to the transition to a Circular Economy (CE) revolve around waste, including its production, reuse, and disposal. The European Commission (2019a) considers waste management a strategic issue for all 28 EU Member States in their transition from a linear to a circular economy. Liu et al. (2017) emphasized the importance of sustainable waste management within the framework of the CE, focusing on the "Reduce, Reuse, and Recycle" (3R) principles. They underscored the necessity of establishing an appropriate legal framework and investing in technologies for efficient resource recycling and waste management infrastructure. Furthermore, Iacovidou et al. (2017b) introduced an innovative approach called "Complex Value Optimization for Resource" (CVORR), aimed at assessing how complex value is generated, lost, and distributed in resource recovery from waste systems. Specifically, municipal waste, even though it represents a relatively small portion (7-10% by weight) of the total waste generated in the EU, is one of the most challenging types to manage due to its mixed and dispersed nature (Malinauskaite et al., 2017). Within municipal waste, food waste emerges as a substantial untapped recyclable component, accounting for nearly 88 million tons generated annually. This wastage not only results in the loss of valuable and often scarce resources such as water, soil, and energy but also contributes to climate change. Only a small fraction (6.3%) of food waste worldwide is diverted from landfills and incineration for composting, making up 22% of discarded municipal waste (European Parliament, 2017b). Additionally, in alignment with the Waste Framework Directive (European Parliament, 2018), builds upon the preceding Waste Framework Directive, which was originally Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain directives, there is a target set for EU Member States to recycle and prepare for reuse 50% of municipal waste by 2020.

Material recycling, composting, and digestion are identified as strategic drivers and strengths of the CE policy in Europe by the Directive. Minelgaitė and Liobikienė (2019) emphasized the significance of reducing, reusing, and recycling behaviours as effective tools for addressing the waste issue in the EU. They also stressed that countries aiming to minimize waste generation should focus on promoting efficient consumption and production patterns. However, these actions, while crucial, do not guarantee a complete transition to circularity. Winkler (2011) identified two structural barriers to improving circularity in terms of product reuse. The first barrier involves a significant accumulation of used materials as in-use stocks, while the second concerns the substantial number of unrecycled materials sent to landfills.

Reusing used materials as secondary raw materials is another crucial aspect, as it can enhance the efficiency and resource sustainability of production processes, contributing to market competitiveness. The 3Rs strategy is not only an environmental but also a market-driven manufacturing strategy (Brissaud and Zwolinski, 2017). According to the European Commission's Circular Economy package (European Commission, 2015b), increasing the use of secondary raw materials can open new markets, reduce production costs, boost business competitiveness, drive innovation, create jobs, and stimulate economic growth. To assess the progress toward a circular economy, quantitative indicators are useful but should be integrated into comprehensive sets that consider their combined effects and the intricacies of system dynamics (EASAC, 2016; Geng et al., 2012).

The concept of a "Just Transition" in the context of the Circular Economy in the EU entails a comprehensive and equitable shift from linear economic models to circular ones, ensuring fairness for all stakeholders involved. This concept is often associated with environmental and social justice considerations. The principles of a Just Transition highlight the necessity for an inclusive and fair process that takes into account the impacts on workers,

communities, and regions affected by the transition to a circular economy. This involves addressing social inequalities, supporting workers in high-polluting industries, and ensuring that the transition towards sustainability leaves no one behind.

This chapter adopts a macro-level approach, focusing on a country-level perspective. Consequently, it is oriented towards observing the activities of policy actors and examining the associated outcomes.

22.2 Material and Methods

For this chapter, a total of 35 official reports have been analysed, including documents from the European Commission (2015a, 2015b, 2016a, 2016b, 2016c, 2016d, 2017a, 2017b, 2017c, 2018a, 2018b, 2018c, 2018d, 2019a, 2019b, 2019c, 2019d), the European Parliament (2017a, 2017b, 2018, 2019), the European Environment Agency (2013, 2018), Eurostat (2017a, 2017b, 2019a, 2019b, 2019c), the European Investment Bank (2017), the European Circular Economy Stakeholder Platform (2018, 2019), the European Economic Area (2019), OECD (2016, 2017), and the United Nations Environment (2019). Moreover, an extensive literature review has been conducted to delve into the subject matter, aiming to furnish a comprehensive overview of the current state and advancements in CE and the concept of a Just Transition to Circular Economy (JUST2CE) within the EU. The scrutiny involved the analysis of approximately 70 scholarly articles. It is worth noting that not all articles have been explicitly cited in this context, as some solely focused on specific facets of certain countries, and, on occasion, did not provide pertinent information for the scope of this review.

In addition to scholarly articles, a meticulous examination of official documentation has been undertaken. Every national website pertaining to the subject has been scrutinized, contributing to a holistic understanding of the initiatives, policies, and strategies adopted by each EU member state in the realms of CE and the Just Transition. This multifaceted approach ensures a nuanced and well-rounded exploration of the landscape, taking into account both academic perspectives and the practical implementations and commitments of individual nations within the EU.

22.3 European Circular Economy

To assess the awareness of the CE in the European context, it is imperative to gain insights into how countries are currently implementing and should further enhance their efforts to drive the transition towards the CE. All these reports share a common objective: to expedite the transition of European nations toward the Circular Economy. I have collated and analysed this information to develop a comprehensive framework that both summarizes the progress achieved thus far and identifies potential avenues for enhancement.

In the context of the European Union's policies within the just transition framework, there is a strong emphasis on respecting social aspects, integrated in the just transition European framework. The Just Transition Framework aims to ensure that the transition to a greener and more sustainable economy is fair and inclusive, considering the social dimensions of change. The alignment of social aspects and their adherence to the principles of the Just Transition Framework is a crucial consideration within the context of this discussion. Several key policies and principles contribute to achieving this goal by means of the following:

- Social Dialogue: Encouraging and facilitating social dialogue is crucial. This involves engaging with workers, employers, and other stakeholders to ensure that the transition is well-managed, and the concerns and needs of all parties are taken into consideration.
- Skills Development: Investing in education and skills development is essential to equip the workforce with the capabilities needed in the evolving economic landscape. This helps workers adapt to new technologies and industries, reducing the risk of job displacement.
- Labor Market Policies: Implementing supportive labour market policies, such as active employment measures and social protection programs, helps mitigate the negative impacts of the transition on vulnerable groups. This includes measures like reskilling programs and unemployment benefits.
- Regional Development: Focusing on regional development ensures that the benefits of the transition are distributed evenly. This involves targeted investments in regions heavily dependent on industries undergoing significant changes, fostering economic diversification and job creation.
- Gender Equality: Promoting gender equality is integral to a just transition. Policies should address potential gender disparities in the workforce and create equal opportunities for men and women in emerging sectors.
- Inclusive Decision-Making: Ensuring that decision-making processes are inclusive and transparent is key. All relevant stakeholders, including local communities, should have a voice in shaping policies related to the transition.
- Social Impact Assessments: Conducting thorough social impact assessments before implementing major changes helps identify potential challenges and allows for the development of tailored solutions to address them.

The transition to CE in EU countries is a multifaceted process involving various initiatives, policies, and collaborative efforts. Listed below are the main programs and initiatives in the European framework:

- EU Circular Economy Action Plan: The European Commission has been a driving force behind the circular economy transition in the EU. The EU Circular Economy Action Plan, introduced in 2020, outlines key initiatives and strategies to advance the circular economy, including sustainable product policies, waste reduction targets, and measures to promote circularity in key sectors.
- Legislation and Regulations: EU member states have been incorporating circular economy principles into their legislation and policies. This includes measures to address single-use plastics, promote recycling, and encourage sustainable product design. Extended Producer Responsibility (EPR) schemes, which make producers responsible for the entire life cycle of their products, have been implemented to incentivize circular practices.
- Waste Management and Recycling: EU countries have set ambitious targets for waste reduction and recycling. The Circular Economy Package includes specific targets for municipal waste recycling, landfill diversion, and reduction of marine litter. Countries are investing in improved waste management infrastructure and practices to achieve these goals.
- Circular Design and Innovation: The EU supports research and innovation in circular design and sustainable technologies. Funding programs, such as Horizon 2020 and its successor Horizon Europe,

provide financial support for projects that contribute to the circular economy, including innovations in materials, manufacturing, and waste management.

- Collaboration and Partnerships: The circular economy transition requires collaboration among governments, businesses, academia, and civil society. EU countries participate in collaborative initiatives and partnerships to share best practices, exchange knowledge, and jointly address challenges related to circularity.
- Consumer Awareness and Education: Raising awareness among consumers about the principles of the circular economy is a key aspect. EU countries are involved in educational initiatives and campaigns to inform the public about sustainable consumption, reuse, and recycling.
- Circular Economy Hubs: Some EU countries have established circular economy hubs or platforms to facilitate networking and knowledge exchange. These hubs bring together stakeholders from various sectors to promote circular practices and innovation. By incorporating these policies and principles into the just transition framework, the EU aims to create an inclusive and socially responsible pathway toward a sustainable and low-carbon economy.

Furthermore, after the Covid-19 crisis, the European Council reached an agreement on July 21st regarding the recovery plan, known as Next Generation EU, in conjunction with the Multiannual Financial Framework (MFF) for 2021-2027. The historic agreement, finalized on December 11th, encompasses a financial package totalling €1.8 trillion. This includes approximately €1.07 trillion allocated to the multiannual financial framework and an additional €750 billion designated for the Next Generation EU (NGEU) recovery instrument. Notably, the NGEU introduces the principle of debt mutualisation, where the European Commission borrows funds on capital markets to finance the recovery instrument.

The agreement places a strong emphasis on environmental sustainability, with a commitment to allocate 30% of MFF and NGEU funds for climate investment. While specific CE objectives are not explicitly outlined, the agreement includes provisions such as a levy on non-recycled plastic packaging waste as a means of generating new own resources. The Recovery and Resilience Facility (RRF) will play a key role, with member states required to present national plans for approval. These plans, evaluated by the European Commission, must align with growth potential, job creation, economic resilience, and the green and digital transition, including a minimum 30% allocation to climate action.

The 'green' transition within these plans encompasses climate and environmental perspectives, necessitating contributions toward achieving 2030 climate and energy targets and the 2050 climate neutrality objective. CE goals are embedded within environmental objectives, urging member states to demonstrate how their plans contribute to sustainable water use, waste prevention, recycling, pollution control, and the greening of urban areas.

Investments will need to adhere to EU Taxonomy Regulation criteria, and to the “do no significant harm principle “must underpin all actions.

The assessment of these plans involves a quantitative approach, specifying the degree of impact on climate and environmental objectives. Member states are expected to provide additional assessments of the direct and indirect impacts of proposed reforms or investments. The methodology draws inspiration from the Rio Markers system developed by the OECD. While the European Commission's application of the OECD system has faced criticism, particularly regarding the EU budget, these evaluation methods will influence the distribution of funds under the recovery measures package.

In addition to Next Generation EU, the Multiannual Financial Framework includes InvestEU, designed to allocate funds to specific programmes and measures, emphasizing sustainable investments. The EIB's role in redirecting private investment toward sustainability could significantly contribute to promoting circular economy solutions. Furthermore, initiatives like ReactEU and the extension of the Just Transition Fund will follow established regulations. Next follows a brief overview that will explain all the 27 countries and their contribution to CE transition in their policies and programs.

Austria

Austria boasts a robust CE profile, with a primary focus on environmental innovation, often referred to as "Green Tech" or "Clean Tech." The nation has been making considerable efforts to enhance municipal waste recycling and has shown a commitment to initiatives that facilitate this transition, such as RepaNet. However, for Austria's Circular Economy Strategy to be truly effective, it should incorporate specific objectives aimed at reducing both raw material consumption and waste production. This is especially crucial because Austria ranks among the top waste producers in the region. While the country's National CE plan emphasizes environmental concerns, it tends to overlook the substantial economic opportunities that the CE can provide. Supporting small and medium-sized enterprises (SMEs) and capitalizing on the fact that the service sector contributes significantly to the national GDP, accounting for 63%, could be further strategic actions to be considered in this endeavour. The Austrian government aims to transform the country's economy and society into a sustainable circular economy by 2050, aligning with ecological goals such as achieving climate neutrality by 2040. The circular economy strategy, outlined in the federal program, focuses on interdisciplinary approaches, involving various sectors, regions, and citizens. Given the dynamic and complex nature of the transformation, the strategy emphasizes adaptability and a flexible approach rather than detailed long-term plans. Despite initial successes, Austria acknowledges the need for comprehensive changes in technology, economics, and societal attitudes for the transition to a climate-neutral circular economy. The strategy provides guiding principles, goals, and intervention areas to facilitate concrete measures and activities. The goal is for Austria to become a leading country in this field, and industry participation is crucial for success.

Belgium

Belgium has crafted a comprehensive framework to bolster the CE within the country. Here, numerous initiatives have been set in motion to facilitate a smoother transition. The government has offered subsidies to reduce landfill usage, imposed incineration taxes targeting the reduction of household and small-to-medium enterprise waste, and made substantial investments in robust infrastructure for separate waste collection. These actions underscore the concerted efforts of the government to promote the CE. However, despite these significant steps, Belgium continues to grapple with challenges, including the high operational costs associated with selective waste collection and the need for higher environmental taxation. On March 25, 2016, the Government of Flanders approved Vision 2050, a comprehensive long-term strategy for the region. This strategy envisions Flanders as an open, social, resilient, and international region that combines prosperity and well-being through smart, innovative, and sustainable approaches, ensuring inclusivity. To implement Vision 2050, Circular Flanders (Vlaanderen Circulair) was established in 2017 as a hub and source of inspiration for the CE. Operating as a partnership between

the government, private sector, civil organizations, and knowledge institutions, Circular Flanders aims to make Flanders a European circular economy trendsetter by 2030. The government has committed to decoupling the material footprint of Flemish consumption from economic growth and reducing it by 30% by 2030. In 2021, Circular Flanders revamped its governance structure to enhance coordination between the Ministers of Environment and the Economy and Innovation. A Steering Group, comprising 20 core partners representing government, private industry, civil society, knowledge institutes, and the financial world, was established. The Circular Construction Strategic Agenda, led by the Confederation of the Construction Industry and OVAM, outlines six ambitions for 2061 through a co-creation process. The choice of 2061 reflects the typical lifespan of contemporary buildings, lasting for 40 years.To address challenges, stakeholders have identified 10 working paths translated into concrete actions. Some of these actions are already in progress, while others are still being developed.

Bulgaria

Bulgaria currently lags in its adoption of the CE. While the country boasts a low per capita waste production rate, it faces substantial challenges in reducing waste generated by SMEs. Moreover, there is a notable scarcity of available funding for enterprises operating in Bulgaria. To enhance the CE's prospects, it is imperative to concentrate on reducing raw material usage and waste production while also implementing tax incentives to encourage new CE investments. The European Commission has advocated for the promotion of 3Rs practices across all economic activities and the implementation of waste prevention measures. Bulgaria has crafted a draft Strategy and Action Plan for transitioning to a circular economy, set for formal adoption in autumn 2022. The cross-sectoral document leverages measures from various strategies and programs related to the economy, environmental protection, and regional development. The primary aim is to boost resource efficiency by implementing the waste management hierarchy, emphasizing waste prevention, promoting material reuse through recycling, minimizing landfill use, and reducing the environmental and health impact of waste. The draft strategy focuses on three key objectives: fostering a green and competitive economy, reducing waste and optimizing resource use, and creating a consumer-benefiting economy. To achieve these goals, specific measures are outlined in the Strategy and translated into actionable activities in the Action Plan. Implementation of the Plan will address imbalances and overcome obstacles to align with the circular economy strategy. The National Development Programme BULGARIA 2030 is a top-tier strategic framework among national programming documents. It establishes the vision and general goals for development policies across government sectors, including territorial dimensions. The document outlines three strategic goals, grouping government intentions into five development areas and setting 13 national priorities. A first three-year Action Plan for implementing the Programme is currently in preparation.

Croatia

Croatia demonstrates a low per capita waste production, yet faces challenges in recycling municipal waste, risking not meeting European recycling targets. The national Circular Economy plan primarily emphasizes waste management and sustainable tourism. To improve, Croatia should prioritize promoting awareness of Circular Economy transition policies and implementing tax incentives. The European Commission strongly advises both

the private and public sectors to incorporate 3Rs practices in their operations and prioritize waste management prevention for enhanced recycling, incineration, and landfill use.

Cyprus

Cyprus, while having below-average per capita waste production, ranks among the top waste producers among the 28 EU Member States. Its national Circular Economy plan predominantly centres around renewable energy sources such as wind and solar power. The country has made substantial investments in resource usage efficiency and energy network infrastructures under the latest framework program (2014-2020). However, its unique geographical location limits multinational corporations' innovative investments, hindering technological advancement. To advance its transition towards a Circular Economy, Cyprus should implement 3R policies aimed at reducing raw material use, municipal waste, and plastics production. Furthermore, investing in research and innovation is crucial to stimulate progress. In 2021, Cyprus adopted its National Action Plan for the Circular Economy 2021-2027. The plan targets key materials and sectors, encompassing the primary, industrial, and service sectors, with waste policy serving as a fundamental and cross-cutting component. It outlines policy measures to facilitate the shift towards a circular economy, aiming to cultivate a circular mindset among industries, businesses, and consumers. The plan also incentivizes businesses to invest in the circular economy, improve circularity, enhance resource efficiency, foster synergies, and create favourable market conditions for circular products and services, ensuring sustainable production and consumption. Specifically, the Action Plan includes programs highlighting business opportunities in the circular economy, financing the development of new circular products and services, boosting investment in circular practices for businesses and the tourism sector, establishing online material sharing platforms, and promoting the development of standards and certifications for systems, products, and services contributing to a circular economy. Additionally, several measures focus on managing waste as a resource, emphasizing increased separate collection of municipal waste to enhance recycling quality.

Czech Republic

The Czech Republic has actively pursued the transition to a Circular Economy and boasts a strong profile in recycling packaging waste compared to the EU28 member states. The country has also received significant EU funding, primarily dedicated to enhancing environmentally friendly innovative technologies and running awareness campaigns aimed at reducing plastic usage. Efforts are underway to address packaging waste issues through the enactment of appropriate legislation. Several initiatives, including the national Waste Management Plan 2015-2024 with a long-term focus on the Circular Economy (Circular Czechia 2040), have been introduced. The country does face challenges in municipal waste management due to the presence of numerous landfills. Additionally, the implementation of EU waste management and plastics regulations has been relatively slow. To further support this transition, it is essential to provide tax incentives for Circular Economy activities, particularly for SMEs. The European Commission strongly recommends both the public and private sectors enhance their 3R actions and incorporate waste prevention practices in their operations. In December 2021, the Czech Republic adopted Circular Czechia 2040, a dedicated national CE strategy. The vision for 2040 is for the circular economy to bring significant environmental, economic, and social benefits to the country, systematically supporting it as a model for improving

environmental protection, strengthening competitiveness and technological sophistication, creating jobs, enhancing raw material security, and developing citizens' competencies. The main goal is "Less waste and more value for the Czech Republic," with 10 strategic objectives. These objectives include improving the state of the environment, reducing waste production, enhancing waste management, strengthening competitiveness, creating new jobs, increasing raw material security, improving technological sophistication and innovation, supporting innovative forms of consumption, acquiring new competencies, knowledge, and skills, creating a non-toxic environment, and expanding the circular economy at regional and municipal levels. Circular Czechia 2040 identifies 10 priority areas for the circular economy in the Czech Republic, defining individual goals and measures within each priority. These areas encompass products and design, industry, raw materials, construction, energy, bioeconomics and food, consumption and consumers, waste management, water, research, development and innovation, education and knowledge, economic instruments, and circular cities and infrastructure.

Denmark

Denmark has been a proactive advocate for the transition to a CE from the very beginning. The country holds a leading position in household waste management and has made significant strides in reducing landfills. However, it should be noted that Denmark ranks among the highest per capita producers of municipal waste and has yet to effectively curtail waste production by Small and Medium-sized Enterprises. Denmark has undertaken several initiatives, including the Danish Strategy for Circular Economy, which focuses on providing economic support to activities that aim to recycle materials, reduce waste, and foster environmental innovation. To facilitate this transition, it is essential to improve the coordination of actions at both the national and local levels to ensure consistency and alignment with the EU's waste hierarchy. This can help avoid discrepancies at the municipal level that may not penalize private companies failing to adhere to the established waste management principles. Additionally, the transition can be further accelerated by introducing tax incentives that promote repair services, the circulation of goods, and transactions with clearly defined social objectives. The Action Plan for Circular Economy (July 2021) serves as Denmark's dedicated national strategy and roadmap for the Circular Economy (CE). It also acts as the national plan for waste prevention and management from 2020 to 2032. The plan outlines Danish targets, indicators, policies, and initiatives across the entire circular value chain, spanning from design and consumption to waste, where natural resources are recycled into new products and materials. While addressing various initiatives along the value chain, the Action Plan particularly focuses on three areas with significant environmental and climate impact: biomass, construction, and plastics. It encompasses 129 national initiatives, many of which are currently in implementation. Most of these initiatives are also part of the broader Strategy for Circular Economy (2018), the Action Plan on Plastics (2018), the Climate Plan for a Green Waste Sector and a Circular Economy (2020), the Strategy for Green Public Procurement (2020), and the National Strategy for a Sustainable Built Environment (2021).

Estonia

Estonia is a country with a strong inclination towards the transition to a Circular Economy. The nation has a notably low per capita waste production and has initiated numerous measures to encourage material reuse. It has successfully implemented a deposit-refund system for beverage packaging, leading to the efficient collection of

almost the entire quantity of such waste. Estonia's commitment to the CE is exemplified by its establishment of the Institute of Circular Economy and Technology, the first of its kind in the country. This institute, located at TKK University, is dedicated to imparting specific skills essential for supporting the CE transition. Moreover, Estonia has been successful in creating effective national networks that bring together both private and public stakeholders involved in the CE system. These networks facilitate information sharing and constructive dialogues aimed at formulating a national CE strategy. Key players in this endeavour include the Circular Economy Forum, the Estonian Association for Environmental Management, and the Ministry of Environmental Affairs. However, Estonia faces several challenges in its transition policy, such as low resource efficiency, limited engagement of national SMEs in waste reduction practices, and an inefficient system for municipal waste and packaging recycling. Estonia is currently in the process of developing a dedicated circular economy strategy, with plans to release a CE white paper in September 2022, followed by an action catalogue by the end of the same year. The draft of the white paper outlines Estonia's vision for a functioning circular system of production and consumption, positioning the country as a smart leader in the transition to a circular economy by 2030. The goal is to establish a circular and competitive business model through sustainable production, smart technologies, and digital solutions. To realize this vision, Estonia emphasizes the importance of creating a favourable social-economic environment and applying guiding principles, including environmental awareness, cooperation, smart solutions, a systemic approach, and an up-to-date legal environment. The draft document outlines key principles for stakeholders, such as needs-based production and consumption, circular design, employing the best available approaches and technologies, following the materials' hierarchy, and promoting sustainable choices among consumers.

Finland

Finland stands out as one of the European leaders in the transition to a Circular Economy. The country has strategically planned a robust national financing system to drive innovation in the CE through initiatives like the Finnish Innovation Fund Sitra. It has also established programs such as RAKI for the recycling of nutrients and has undertaken various projects focused on plastic reduction and CE, including notable efforts like CIRCWASTE. Finland hosted the World Circular Economy Forum conference, which played a pivotal role in promoting the adoption of best practices and setting essential transition guidelines. The CE transition in Finland has been further catalysed by the widespread awareness within the national community about the opportunities that a CE can offer to both traditional and emerging businesses. Additionally, the government has introduced incentive taxes to encourage recycling and reuse activities. To further strengthen the country's eco-innovation efforts, a particular focus should be placed on harmonizing its legislative framework with the criteria for sustainable forestry outlined by the European Parliament, as well as safeguarding the biological cycle. Finland has two primary Circular Economy strategies: "The Critical Move – Finland's Roadmap to the Circular Economy 2.0" (an updated version of the 2016 roadmap) and the more recent "Strategic Programme to Promote a Circular Economy". The Strategic Programme aims to transform the economy into a circular one based on its principles by 2035. It seeks to strengthen Finland's leadership in the circular economy and contribute to the government's goal of carbon neutrality by 2035. The vision for the CE Programme in 2035 is a carbon-neutral circular society, where sustainable products and services form the economic foundation, the sharing economy is ingrained in daily life, choices bolster a fair welfare society, natural resource use is sustainable, and materials circulate longer and more securely. The breakthrough in circular economy adoption relies on innovation, digital solutions, smart regulation, and responsible

involvement from investors, businesses, and consumers. Finland envisions being a global leader and sustainable solutions provider on the international market through the circular economy. To realize this vision, the CE Programme sets objectives, including a decrease in the consumption of non-renewable natural resources, with sustainable use of renewable resources limited to ensure total consumption of primary raw materials in Finland by 2035 does not exceed 2015 levels (excluding resources used for export products).

France

The CE transition in France has led to notable improvements in waste reduction and increased recycling. The country unveiled a national CE roadmap in 2018, featuring effective objectives designed to support this transition. This success can be attributed to the collaborative efforts of the Ministry for an Ecological and Inclusive Transition, the Ministry for the Economy and Finance, and the Institut National de l'Économie Circulaire (INEC). Furthermore, France has implemented a robust legal framework to promote 3R (Reduce, Reuse, Recycle) activities. It has imposed legal sanctions for non-compliance with rules related to collection, recycling, and packaging, especially in the context of plastics. The country has also raised taxes on waste disposal in landfills while reducing taxes on recycling operations. Additionally, social enterprises involved in the collection and sale of used goods receive incentives, including VAT exemptions. Nevertheless, small and medium-sized enterprises would benefit from additional support. Implementing a national program to encourage circular design training could help reduce raw material usage, minimize waste production, and promote practices like reuse, repair, and sharing. In 2018, France adopted a Circular Economy Roadmap, comprising 50 measures categorized into four main priorities: improving consumption, production, waste management, and mobilizing stakeholders. Key objectives include a 30% reduction in natural resource use relative to GDP by 2030, a 50% reduction in non-hazardous waste landfilled by 2025, and aiming for 100% plastic recycling by 2025. The goal is to avoid 8 million tonnes of carbon dioxide emissions annually through plastic recycling and create up to 300,000 additional jobs.In 2020, the Law Against Waste and for the Circular Economy was enacted to implement these measures, along with additional ones. Measures already in force include the establishment of new extended producer responsibility (EPR) schemes, a repairability index for electronic products, a ban on destroying unsold products, mandatory circular public procurement objectives, restrictions on plastic packaging, and requirements for informing consumers about the environmental characteristics of products. Other measures involve banning single-use plastic products by public authorities, providing information on the carbon footprint of data consumption, and setting minimum availability periods for spare parts for certain products.

Germany

Germany stands at the forefront of the transition towards the Circular Economy and excels in efficiently managing its municipal waste recycling system. The country has implemented a series of well-coordinated CE initiatives, showcasing a strong national-level coordination to enhance resource efficiency and achieve recycling targets. One of Germany's key strengths in the CE realm lies in its promotion of incentives for reuse and design for recycling. This includes measures such as fiscal incentives and a favourable legislative framework. To further encourage recycling practices, Germany introduced a new Packaging Act, complete with a National Packaging Registry. The German CE plan benefits from a robust national policy framework and a population that is highly aware and

receptive to sustainability issues. However, the country faces a significant challenge due to its high per capita waste production, which remains a pressing concern in this context. While not initially designed as a Circular Economy (CE) strategy, the second update of the German Resource Efficiency Programme (ProgRess III), released in June 2020, can be considered as such. The primary objective of ProgRess III is to enhance the sustainability of natural resource extraction and usage, ensuring the long-term preservation of vital natural foundations for future generations. The program outlines measures across the value chain, from raw material extraction to product design, production, consumption, and waste management, focusing on resource efficiency. ProgRess III, with nearly 120 measures and overarching strategies, aligns with all 10 R-strategies of a Circular Economy. Notably, the program concentrates on the material use of abiotic and biotic raw materials, excluding other resources like water, land, soil, and ecosystem services, which are addressed by specific policies and strategies. Similarly, the utilization of fossil and biotic resources for energy generation is covered in various strategies related to Germany's energy transition. ProgRess III aims to close material cycles and underscores the crucial role of product design in achieving these goals.

Greece

The country's performance in both the private and public sectors is notably deficient. The main weaknesses in 3R actions stem from the challenges posed by the linear economy, resulting in a slow response to the proposals put forth by the EU Commission. Despite some efforts to introduce new legislation and allocate funds for educational and organizational purposes, the goals of these measures have been twofold. They seek to enhance knowledge about the Circular Economy while simultaneously improving governance structures through the establishment of a dedicated operational organization aimed at facilitating the transition. It's worth mentioning that these recent efforts align with recommendations from the European Commission. However, they are clearly insufficient to drive a transition from a linear to a circular economy. The European Commission has strongly urged both the private and public sectors to actively promote 3R actions in their activities, enforce waste management prevention practices, implement the National Action Plan on Circular Economy, advocate for transparency laws and regulations, simplify administrative procedures, and embrace Circular Procurement. The Greek Governmental Economic Policy Council approved the National Circular Economy Strategy in December 2018, accompanied by a two-year action plan. The strategy aims to stimulate growth towards a circular economy in alignment with the country's development strategy, focusing on sustainable resource management, support for circular entrepreneurship, and circular consumption. However, due to a lack of tangible results from the initial two-year action plan and considering recent EU developments, including the European Green Deal and the 2020 EU Circular Economy Action Plan, the Hellenic Ministry of Environment and Energy has drafted a new National Circular Economy Action Plan (National CEAP) for the 2021-2025 period. This plan, officially adopted by the Minister's Council Act No 12 on April 29, 2022, aligns with revised national legislation implementing the 2018 EU Circular Economy legislative package. It ensures strong synergies with the 2030 National Waste Management Plan (NWMP) and the recently adopted 2030 National Waste Prevention Programme (NWPP).

Hungary

The shift from a linear to a circular economy in this Member State has been characterized by a sluggish and intermittent progress. Various barriers hinder this transition, notably the absence of widespread resource-efficient and strategic thinking that could facilitate the process. These challenges are pervasive in both the public and private sectors. Within the private sector, both SMEs and large corporations remain firmly entrenched in the linear economy paradigm. In the agricultural and public sectors, no effective plans or actions have been set in motion to support the transition. The European Commission has underscored the significance of taking specific actions to address these challenges. This includes implementing a Hungarian Circular Economy Roadmap, reducing the consumption of raw materials and waste production, increasing activities related to reuse, repair, and sharing (often referred to as 3Rs), safeguarding the environment, and promoting domestic economic growth. In October 2019, the Energy Efficiency Operational Programmes of the Ministry for Innovation and Technology successfully secured EUR 500,000 in funding from the European Commission for the "Introducing Circular Economy and Addressing Waste Management Challenges" project under the Structural Reform Support Programme. Hungary, in collaboration with the Organisation for Economic Co-operation and Development (OECD) as the lead contractor and relevant policy and economic actors, is currently developing a national Circular Economy strategy with a vision statement for 2040. The project, expected to be completed by the end of 2022, focuses on three priority areas with the highest circular potential for Hungary: food/biomass, construction, and plastics. The envisioned statement and objectives are as follows: By 2040, Hungary aims to become a more competitive and sustainable economy, embracing a comprehensive approach to the CE transition that extends beyond waste management to include the industrial, agricultural, and service sectors. All stakeholders will collaborate to achieve the following targets by 2040, compared to 2019 levels: reduce material consumption, close the loop of materials used in the economy, and generate economic value in material-related activities.

Ireland

The Member State has established a robust network for re-use and repair, complemented by various government support programs.
Ireland's CAP Strategic Plan for 2023-2027 is designed to benefit consumers, farm families, and rural communities by supporting the production of safe, sustainable food and contributing to climate and environmental goals.
The CAP is divided into two pillars. Pillar 1 includes direct support through agri-environment schemes and market measures to provide income support and stabilize markets in the face of challenges. This pillar ensures farmers receive support for their land management efforts, maintains farming activities adapted to local conditions, and aligns production with consumer demands. Pillar 2 focuses on rural development, co-financed by EU member states, to modernize farms, enhance competitiveness, protect the environment, and support rural communities. Measures include promoting technology uptake, addressing climate change, encouraging generational renewal in farming, and boosting rural areas through investments. Ireland, as a member state, works closely with the European Commission and the EU Court of Auditors to implement its CAP Strategic Plan, aiming to protect farm incomes, recognize the efforts of farm families, and contribute meaningfully to climate goals. The plan emphasizes sustainable agriculture, viability, and the vitality of rural communities. Nevertheless, the impact of these initiatives

has been more pronounced within the public sector, with less substantial results observed in the private sector. Notably, small, and medium-sized enterprises and large corporations have struggled to enhance the efficiency of the 3R strategy. The European Commission emphasizes the significance of executing a Green Deal Circular Procurement and the advancement of an Irish Circular Economy Roadmap. Ireland has undergone significant policy and legislative initiatives to transition to a circular economy, as highlighted in the OECD's 2022 report on The Circular Economy in Ireland. The country is deemed to be at a crucial turning point in this transition. Several key developments include the publication of a new waste policy, "A Waste Action Plan for a Circular Economy," in September 2020. In December 2021, Ireland introduced its first national Whole of Government Circular Economy Strategy. Subsequently, the Circular Economy and Miscellaneous Provisions Act 2022, known as the Circular Economy Act 2022, was published in July 2022. The National Waste Prevention Programme has been transformed into a national Circular Economy Programme, published in December 2021, and the new National Waste Management Plan is being drafted with a focus on a Circular Economy. The National Hazardous Waste Management Plan 2021–2027 has also been realigned to support and deliver a circular economy. The Waste Action Plan for a Circular Economy shifts the focus from waste disposal to preserving resources through circular economic practices, outlining aims, targets, and corresponding measures for the State. The Whole of Government Circular Economy Strategy 2022–2023 is Ireland's inaugural national strategy for the circular economy, emphasizing an overarching policy vision and approach.

Italy has undertaken a comprehensive approach to embrace a CE, positioning it as a cornerstone in its strategic development. The National CE Strategy serves as a guiding framework, steering the country's shift from a linear to a circular economic model. This overarching strategy encompasses measures designed to enhance resource efficiency, reduce waste, and promote sustainable production and consumption practices. In parallel, Italy has enacted legislative measures and policies geared towards propelling the circular economy forward. A pivotal aspect of Italy's CE endeavours is its concerted focus on waste management. The nation has implemented initiatives to revamp waste collection systems, elevate recycling infrastructure, and champion waste-to-energy projects. The overarching goal is to minimize reliance on landfills and facilitate the recovery of materials from waste streams. In tandem with these efforts, Italy is channelling investments into research and innovation, funding is directed towards projects exploring sustainable technologies, circular design principles, and innovations in waste management methodologies. Businesses in key sectors, such as fashion and manufacturing, are actively embracing circular economy principles in Italy. Initiatives within these sectors focus on waste reduction, material reuse, and the implementation of sustainable production methods. The Ministry of Ecological Transition adopted the National Circular Economy Strategy in June 2022 as part of Italy's Recovery and Resilience Plan. The strategy, under Mission 2, Component 1, focuses on key milestones tied to loan payments, including a new digital waste traceability system, tax incentives for recycling and secondary raw material use, revised environmental taxation on waste, the right to reuse and repair, and reforms to extended producer responsibility (EPR) and Consortia systems. It also supports existing regulatory tools like end-of-waste legislation, minimum environmental criteria for green public procurement (GPP) in construction, textiles, plastics, and waste electrical and electronic equipment (WEEE), along with backing industrial symbiosis projects. The overarching targets for 2035 include developing secondary markets for raw materials, reforming EPR and Consortia systems, creating a favourable fiscal system for a circular economy, strengthening upstream circularity strategies like eco-design and product lifespan extension, adopting methodologies to quantify environmental impacts, and integrating circular economy issues into school curricula and professional training.

Latvia

Latvia's progress in the CE field has been rather unsatisfactory, primarily due to issues in waste management. The main challenges relate to the inadequate collection and sorting of materials, as well as the limited economic value generated from recycling efforts. Furthermore, there is a noticeable lack of awareness among stakeholders regarding the necessity of transitioning to a circular economy. Recommendations from the European Commission revolve around the 3R strategy, which encompasses waste reduction, material reuse, and recycling. Specifically, these suggestions emphasize the utilization of EU funding to enhance waste management infrastructure while promoting consistent regulations at both national and local levels. Additionally, they propose the adoption of the Green Deal for Circular Procurement, targeting both the public and private sectors, along with the inclusion of a free training program. Latvia introduced a CE strategy, the Action Plan for the transition to a circular economy 2020–2027, in 2020. The plan aims to establish a policy framework fostering Latvia's transition to a CE while aligning with the European Green Deal and UN Sustainable Development Goals. The Action Plan focuses on prudent implementation of the CE in Latvia, promoting thoughtful resource planning, utilization, and sustainable production and consumption across sectors.

Lithuania

Lithuania has made significant progress within the private sector, where both SMEs and larger companies have undertaken strategic initiatives aimed at aligning with the circular economy's principles. Their actions are geared towards meeting market demands and addressing environmental concerns, thereby facilitating the transition. However, the situation is quite distinct within the public sector. Here, there is a pressing need for more substantial efforts, marked by the absence of effective policy measures promoting the transition and limited government engagement at both the national and local levels. These challenges continue to impede CE advancements. The European Commission has put forth several recommendations to address these issues. These suggestions encompass the following actions: redirecting investment cash flows from incineration towards more sustainable options, implementing taxes on landfill usage, and enforcing EU regulations on waste management and plastics within the next two years. Furthermore, the EU Commission has advised pursuing additional EU funding to establish a national support program for promoting economic growth within the public sector. This program should focus on targeted activities designed to foster the creation of a CE hub. Lithuania is increasingly prioritizing the transition to a CE to achieve climate neutrality and sustainable development goals while ensuring economic growth and environmental safety. A working group has been established to formulate the National Action Plan for the Circular Economy covering 2023–2035, with the draft set for completion in October 2022. This plan will address circularity in various sectors, including industry, bioeconomy, transport, construction, consumption, and new business models. The shift to a CE necessitates a new approach to raw material use and product consumption, emphasizing the widespread adoption of eco-design to create high-quality, easily repairable, and recyclable products. Despite these efforts, Lithuania's circular material use rate is currently low at around 4.4%, significantly below the EU average of nearly 13%. Lithuania's key objectives for the waste sector include expanding the separate collection of biowaste, textile waste, and furniture waste, providing financial support for innovation and recycling, implementing recycling taxologies, and increasing the use of secondary raw materials to align with the EU average.

The completed roadmap for Lithuania's industrial transition to a circular economy will serve as the foundation for the upcoming National Action Plan.

Luxemburg

Luxembourg adopted a national Circular Economy (CE) strategy in February 2021, and it has been made available on the CE portal. This strategy serves as a practical guide for public authorities to implement circular practices within specific sectors falling under their jurisdiction, including construction, education and training, finance, food and biomaterials, industry, and retail. The strategy outlines general tools for public authorities to activate and align within their respective sectors, encompassing regulation and standards, financial aspects, and knowledge creation and management. A co-creation approach is employed, encouraging collaboration with relevant public and private stakeholders. To ensure tangible impacts, roadmaps will be developed for each sector, setting meaningful objectives and indicators. The strategy's key goals involve aligning national initiatives and establishing an information and coordination platform. This platform involves collaboration among five national ministries: energy and spatial planning, economy, environment, climate and sustainable development, finance, and labour, employment, and the social and solidarity economy. The implementation of concrete projects is delegated to various national agencies, working in partnership with industry or municipalities.

Malta

Malta has experienced an exceptionally sluggish pace of progress, primarily attributable to a range of natural barriers. These obstacles include a heavy reliance on external energy sources, limited access to natural resources, and delays in the innovation process within the private sector. To address these challenges, the European Commission has offered a series of systemic actions as recommendations. These proposed actions encompass the implementation of EU regulations concerning waste management and plastics within the next two years. Additionally, the Commission suggests initiating a Green Deal focused on Circular Procurement, which is intended to encompass both the public and private sectors. Complementing these measures is the introduction of a free training program aimed at facilitating the transition towards a circular economy. Malta has introduced a Circular Economy Strategic Vision, titled "Towards a Circular Economy 2020–2030." This vision aligns with the government's commitment to constructing the nation's inaugural waste-to-energy facility and its ongoing initiatives to diminish landfill use. The goal is to cultivate an environment conducive to a sustainable, low-carbon, resource-efficient, and competitive economy, aligning with the EU Commission's Circular Economy Strategy. The initial emphasis has been on implementing Action 3, with plans for commencement soon. The overarching regulatory framework is primarily governed by S.L. 549.134 Beverage Containers Recycling Regulations. These regulations aim to boost the circular economy by establishing a beverage-container refund scheme, enhancing the collection and recycling of beverage containers, increasing national recycling endeavours, and reducing litter. It's noteworthy that these regulations do not exempt producers placing beverages in containers on the market from their obligations under S.L. 549.43 Waste Management (Packaging and Packaging Waste) Regulations for any beverages, beverage containers, or other packaging not covered by these specific regulations.

The Netherlands

This Member State stands out as a pioneering force in Europe's transition towards a CE. The systemic actions and initiatives the country has undertaken have solidified its position as a leader in driving this transition. The Netherlands has introduced an array of comprehensive roadmaps, strategies, and programs involving both the private and public sectors. This approach has engaged all relevant stakeholders in a collective effort to promote the transition. Despite its impressive progress, the European Commission has recommended further measures to support the CE's continued growth within the country. These recommendations include establishing a long-term budget dedicated to sustaining the Circular Economy, primarily funded by domestic resources. The Commission also encourages fostering cross-sectoral collaboration and nurturing the development of new circular value chains. The primary objectives encompass achieving a 50% reduction in raw material consumption by 2030 and establishing a circular economy in the Netherlands by 2050. The comprehensive government program, "A Circular Economy in the Netherlands by 2050," was introduced to the House of Representatives on September 14, 2016. This program outlines the necessary steps to utilize raw materials, products, and services more efficiently and intelligently, aiming to realize the circular ambition by 2050. By 2030, the consumption of primary abiotic raw materials should be halved, and the Dutch government has articulated three key goals to expedite the circular transition of the economy: Enhancing the efficiency of production processes to reduce the need for raw materials. Utilizing sustainably produced renewable raw materials, such as biomass, to diminish dependence on fossil fuels and benefit the environment. Developing new production methods and designing products with circularity in mind. These national goals align with international commitments, including EU circular economy policy, the UN 2030 Sustainable Development Goals (SDGs), and the Paris Agreement on climate. The Dutch government's circular economy webpage includes a timeline for the transition towards 2050 and relevant policy documents published until the end of 2021. Implemented initiatives include the 2017 Raw Materials Agreement, involving over 400 parties from government and industry, outlining steps for the Dutch economy to run on renewable resources. In 2018, five transition agendas were formulated for sectors like plastics, consumer goods, manufacturing, construction, and biomass and food, focusing on achieving circularity by 2050. The webpage "Accelerating the transition to a circular economy" describes these transition agendas.
In 2019, the Dutch government presented the Circular Economy Implementation Programme, translating the five transition agendas into concrete actions and projects to be implemented between 2019 and 2023.

Poland

Poland is a Member State that currently has a relatively low focus on the CE. Several factors contribute to this situation, primarily stemming from the public sector's limited responsiveness to the transition. Additionally, the agricultural and manufacturing sectors face significant technological gaps in their adoption of circular practices. Considering these challenges, the European Commission has proposed a set of recommendations designed to propel Poland's CE efforts forward. These suggestions include implementing the Polish CE roadmap, reducing raw material consumption, curbing waste production through the principles of the 3Rs (reduce, reuse, recycle), optimizing resource utilization, and ultimately achieving full circularity within the next decade. These actions are aimed at promoting and accelerating the country's transition to a CE. In 2019, the Council of Ministers approved the Circular Economy Roadmap developed by the Ministry of Economic Development and Technology. The

roadmap focuses on various tools, not limited to legislation, to facilitate the transition to a circular economic model in Poland. It encompasses activities related to sustainable industrial production, consumption, bioeconomy, new business models, and the implementation and monitoring of the circular economy. The roadmap, spanning until 2023, involves over 40 tasks assigned to specific ministries. The Ministry of Economic Development and Technology, for instance, is engaged in activities such as conducting a feasibility study on a platform for secondary raw materials, developing a government information platform on circular economy, conceptualizing a support ecosystem for enterprises based on circular economy business models, establishing the National Smart Specialisation for the circular economy, and implementing the This-is-CE (oto-GOZ) project, which aims to assess the progress and impact of the circular economy in Poland. The roadmap serves the overall development of the circular economy, with tangible benefits reported by the responsible ministries.

Portugal

Portugal has demonstrated a commendable commitment to a CE agenda within the public sector. This focus is evident in efforts aimed at reducing and reusing materials to enhance service delivery. Notably, these principles have been extended to include immaterial resources, such as the reuse of software within public administrations. However, while the public sector exhibits strength in these areas, the private sector presents a different picture. Within the private sector, both small and large companies have made progress in improving their CE performance. Nevertheless, numerous challenges persist. Local waste recycling and material reuse practices within the private sector remain notably inefficient, and the 3R strategy's implementation is rather weak. Recognizing these challenges, the European Commission has provided specific short-term recommendations. These recommendations emphasize the need for intensified measures to protect the environment and the establishment of a legislative framework to ensure compliance. These actions are strategically aimed at supporting the economic growth of local companies and facilitating the transition from a linear to a circular economy. The Portuguese National Action Plan for the Circular Economy (PAEC), adopted in December 2017 and implemented from 2018 to 2020, is currently undergoing revision to address new circular economy challenges. The PAEC aims to propel Portugal towards its 2050 ambition, focusing on carbon neutrality, resource efficiency, knowledge advancement, inclusive economic prosperity, and a flourishing society. The plan operates at national, sectoral, and regional levels, aligning with EU Circular Economy Action Plan pillars and targeting specific areas such as design, market, education, food waste, and research and innovation. Sectoral focus includes resource-intensive industries like construction, textiles, tourism, and consumer goods. Regional agendas for the circular economy have been developed to adapt national objectives to regional contexts, fostering collaboration and coordination.

Romania

Romania faces considerable challenges in its pursuit of improved CE performance. The country lags other Member States in both the private and public sectors at both the national and local levels. This delay is evident at all levels and is exacerbated by the fragmented and uncoordinated nature of the measures taken thus far. To drive improvements, a shift towards a 3R approach is essential. This approach should involve the development of new products crafted from reused or recycled materials, as well as the promotion of reusable products. In this context, the European Commission has put forth specific recommendations for both the private and public sectors. These

recommendations are focused on actions that address environmental concerns and the establishment of a comprehensive legislative framework to guide and support CE initiatives. Romania recently approved the National Strategy for the CE through Government Decision no. 1172/21 September 2022. Developed in collaboration with key ministries, this strategy aims to guide the transition from a linear to a circular economic model. It focuses on 14 economic sectors, highlighting seven with the highest circularity potential: agriculture, automotive, construction, consumer goods (food and beverages, packaging, textiles), and electrical and electronic equipment. The primary objective is to establish a framework for circular economy transition through an Action Plan. The success metric is the decoupling of economic development from natural resource use and environmental degradation. Aligned with UN Sustainable Development Goals, global climate objectives, and the EU Circular Economy Action Plan, this strategy integrates with Romania's National Strategy for Sustainable Development 2030 and the National Recovery and Resilience Plan. A joint inter-ministerial coordination process, led by the Head of the Chancellery of the Prime Minister, will adapt the strategy to national specifics and global trends. This collaborative approach involves key stakeholders for effective implementation. The timeline foresees the adoption of the Circular Economy Strategy and Action Plan by 2023, with an Action Plan in place by the third quarter of 2023, ensuring Romania's transition by 2030.

Slovakia

Despite increased efforts, Slovakia has made minimal progress in its transition towards a CE. Inefficient municipal waste management practices, coupled with delays in implementing CE principles, have contributed to these limited results. To expedite the CE transition, the European Commission has recommended several key actions. First, the launch of a Green Deal Circular Procurement initiative is crucial for both the public and private sectors. Additionally, the initiation of free training programs can help build necessary skills and knowledge. Ensuring compliance with EU regulations on waste management and plastics within the next two years is also imperative. One strategic objective to achieve is a reduction in per capita municipal waste production in both the public and private sectors. These measures are essential for supporting the transition from a linear to a circular economy. Slovakia has undertaken a project aligned with the Organisation for Economic Co-operation and Development (OECD) and the European Commission Roadmap for Circular Economy in the Slovak Republic. The roadmap concentrates on three primary focus areas: promoting sustainable consumption and production, particularly through economic instruments; exploring circular economy potential within the construction sector; and working towards circularity in the food and bio-waste value chain. The policy measures identified in these areas aim to boost the utilization of secondary raw materials, encourage eco-design and eco-innovation, promote circular consumption patterns, and enhance waste management, reuse, and recycling.

Slovenia

Slovenia has undertaken numerous initiatives with the aim of achieving circularity, but many of them have not been successful. This is primarily due to the lack of improvements in waste management and a production system that remains rooted in the linear economy. In response to these challenges, the European Commission has provided critical recommendations. They emphasize the strategic importance of implementing a Green Deal on Circular Procurement for both the public and private sectors, accompanied by the establishment of a free training program.

Furthermore, the EU Commission advises reducing the use of raw materials and minimizing waste production. To address these recommendations effectively, Slovenia must put in more effort to promote the use of secondary raw materials and establish a suitable materials accounting system. These actions are essential for achieving circularity objectives within ten years, in compliance with EU recommendations. In 2018, the Slovenian government introduced the Roadmap toward a Circular Economy as an ongoing process rather than a conclusive document. This strategic initiative aims to provide guidelines for Slovenia, ensuring a systematic and controlled transition to a CE. While primarily directed at the Slovenian government, the roadmap also extends its focus to all stakeholders who have played crucial roles in its development. These stakeholders, as co-creators, bring valuable insights and examples of good practices that may otherwise go unnoticed or unsupported. The roadmap seeks to achieve several goals: Outline the potential for Slovenia to lead the transition to a CE in Central and Eastern Europe. Engage stakeholders in identifying and connecting circular practices. Provide recommendations to the government to facilitate a more efficient transition. Identify circular opportunities that enhance Slovenia's international economic competitiveness and improve the quality of life for its citizens.
Recognized priority areas within the roadmap include the food system, forest-based value chains, manufacturing industry, and mobility.

Spain

Spain is making significant strides in the transition to a CE in both the private and public sectors. Notably, the private sector, encompassing SMEs and large corporations, is demonstrating substantial progress in promoting employment development and resource efficiency through the advancement of the reuse process. However, there are still areas that require attention, such as increasing the recycling of municipal waste and fostering greater stakeholder engagement. In response to these challenges and opportunities, the European Commission has put forth essential recommendations. These recommendations include the swift implementation of the new EU regulations concerning waste management and plastics within the next two years. Furthermore, Spain should enhance its Circular Economy Roadmap and focus on reducing raw materials use and waste production to further bolster its CE initiatives.
In June 2020, Spain approved the Circular Economy Strategy (España Circular 2030), aiming to establish a new production and consumption model. This strategy focuses on maintaining the value of products, materials, and resources within the economy for as long as possible, minimizing waste, and maximizing reuse. España Circular 2030 aligns with EU Circular Economy Action Plans, the European Green Deal, and the UN 2030 Agenda for Sustainable Development. The strategy outlines goals for 2030, including reducing material consumption, waste, and greenhouse gas emissions, promoting reuse, and improving water use efficiency. The Circular Economy Action Plan I, adopted in 2021, allocates a budget of EUR 1,529.47 million for 116 measures. These measures, grouped into five axes and three action lines, address production, consumption, waste management, secondary raw materials, and water purification and reuse. Specific initiatives include promoting eco-design, enhancing product labeling, improving waste hierarchy practices, supporting water purification and reuse, and fostering research, innovation, and competitiveness. The Action Plan aims to achieve the outlined objectives by 2030, with mid-term assessments underway for the 116 measures.

Sweden

Sweden has showcased an impressive commitment to implementing a CE. The country has deployed numerous strategies to effectively realize CE objectives. Particularly within the private sector, both SMEs and large corporations have adopted proactive behaviours to swiftly achieve the goals outlined by the national government and the European Union. It is noteworthy, however, that this proactive attitude in the private sector is not mirrored in the public sector. While specific objectives have been achieved in the public sector, both at the local and central levels, a systemic transformation in public administration has yet to materialize. A few examples of commendable practices within the private sector include the application of a reduced VAT rate and income tax reductions for certain repair services. Following the recommendations of the European Commission, these actions have the potential to cultivate a collective ambition to shift from a linear economy to a circular one. Sweden adopted a National Strategy for CE in July 2020, followed by a CE action plan and an Action Plan for Plastics. Aligned with environmental, climate, and Sustainable Development Goals, the vision is an efficient, non-toxic circular flow of resources. Four focus areas include better product design, sustainable consumption, non-toxic material cycles, and incentives for circular transition. Six prioritized material streams are plastic, textiles, food, renewable materials, construction, and critical metals. The Action Plan, linked to the CE strategy, comprises over 100 measures targeting production, consumption, hazardous substances, and innovation. Notable actions include establishing a national platform for sustainable fashion, coordinating efforts for sustainable plastic use, enhancing non-toxic product design, and funding research for circular business models. A separate Action Plan for Plastics has been published. National Waste Management Plan and Waste Prevention Programme are also in place. Sweden's Action Plan for Sustainable Regional Development (2022–2024) focuses on smart specialization and fostering a competitive, circular, and bio-based economy. It emphasizes regional cooperation, knowledge sharing, and supporting small and medium-sized enterprises in their circular transformation.

22.4 Discussion

EU countries share several similarities in their approaches to circular economy initiatives. While individual countries may have unique strategies, there are common themes and practices that reflect the collaborative and integrated nature of EU policies. Here are some key similarities/commonalities:

- EU Circular Economy Action Plan: EU countries align with the EU Circular Economy Action Plan, which provides a comprehensive framework for promoting a circular economy. The plan includes initiatives to improve resource efficiency, reduce waste, and foster sustainable production and consumption practices. Waste Management and Recycling Targets: EU member states adhere to common waste management and recycling targets set by the EU. These targets aim to reduce landfilling, increase recycling rates, and promote the sustainable management of waste streams.
- Product Design and Extended Producer Responsibility: Countries in the EU focus on promoting eco-design principles to enhance the recyclability and durability of products. Many countries also implement Extended Producer Responsibility schemes, holding manufacturers accountable for the entire life cycle of their products.

- Plastic Waste Reduction: There is a shared commitment to reducing plastic waste. EU countries are working towards the implementation of measures such as single-use plastic bags, promoting alternatives, and increasing recycling of plastic materials.
- Circular Procurement: EU countries emphasize circular procurement practices to encourage the purchase of goods and services with a lower environmental impact. This involves considering the life cycle of products in public procurement decisions.
- Innovation and Research: A common focus on research and innovation to support the CE is evident. Countries collaborate on projects and share best practices to accelerate the development and adoption of innovative technologies and processes.
- Awareness and Education: EU countries recognize the importance of raising public awareness and promoting education about the principles of the CE. Initiatives include campaigns to inform citizens about waste reduction, recycling, and sustainable consumption.
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- Collaboration and Knowledge Exchange: Collaboration and knowledge exchange between EU countries play a crucial role. Platforms, networks, and forums facilitate the sharing of experiences, challenges, and successful strategies in implementing circular economy initiatives.
- Legislation and Policy Alignment: The regulatory frameworks of EU countries are often aligned to comply with overarching EU legislation related to the circular economy. This ensures a consistent and harmonized approach across member states.
- Circular Economy Stakeholder Engagement: Governments, businesses, NGOs, and other stakeholders actively engage in dialogues and partnerships to promote the circular economy. This collaborative approach helps address challenges and create synergies for sustainable development.

While each EU country tailors its CE initiatives to its specific context, these commonalities reflect the shared commitment to advancing a CE agenda across the European Union. Considering the prevailing social and economic conditions in EU countries and the state of our natural environment, the transition to a Circular Economy appears not only essential but imperative. With a growing global population, the availability of raw materials worldwide is becoming increasingly limited, emphasizing the urgency of shifting our focus towards recycling and proactively preventing waste generation. The European Union holds a pivotal role in propagating the CE concept. It has released numerous CE-related documents and mandated its member states to engage in the processes necessary for transitioning their economies toward a CE model. Essential for the successful implementation of CE are the measurement and evaluation of the actions taken. This includes monitoring the progress of the transformation towards a CE, as well as assessing the effectiveness of CE objectives at multiple levels, such as macro, meso, and micro levels.

The varying levels of progress among individual countries in their transition to the CE can be attributed to several factors. These include the adoption of different development strategies aimed at shifting their economies toward a circular model, as recommended by EU ministers at the Environment Council in June 2016. Furthermore, disparities in social and economic development, notably between the EU-15 and the EU-13 countries, play a significant role. Regrettably, the outcomes achieved thus far suggest that only a limited number of these development strategies can be deemed effective in aligning with the circular economy standards set by the European Union and in some countries.

In summary, the European Union's progress towards adopting a circular economy has been remarkably sluggish. From 2015 to 2021, the collective circularity rate of all 27 EU member countries only increased by a meagre 0.4 percentage points. Disconcertingly, seven countries, namely Lithuania, Sweden, Romania, Denmark, Luxembourg, Finland, and Poland, regressed during this period. Consequently, auditors have cast doubt on the EU's ambition to double its proportion of recycled materials integrated back into the economy by 2030, deeming it a formidable challenge.

A circular economy aims to maximize the value of products, materials, and resources by minimizing waste. To facilitate this transition, the European Commission introduced two Circular Economy Action Plans. The initial plan, launched in 2015, included 54 specific actions, while the second plan, released in 2020, added 35 new actions and set the target of doubling the "circularity rate" by 2030 – the proportion of materials recycled and reintegrated into the EU economy. These plans are not legally binding but were designed to assist member states in boosting circular economy initiatives in recent years. By June 2022, nearly all EU countries had either adopted a national circular economy strategy or were in the process of developing one. To support the transition, the EU allocated over €10 billion between 2016 and 2020 for green innovation and aiding businesses in embracing the circular economy concept. However, member states predominantly spent this funding on waste management rather than preventing waste through circular design, a strategy that likely would have had a more substantial impact. While the latter strategy could potentially yield a more significant impact, it is not the primary emphasis within the framework of the just transition in the CE. While the EU action plans did incorporate several initiatives aimed at promoting innovation and investment, there is still a substantial distance to cover in this regard.

22.5 Conclusions

The CE model represents a departure from the prevalent linear economic model, characterized by the "take, make, consume, dispose" approach. It advocates for closing the loop, replacing the "dispose" stage with "reuse." The principles of the CE are applicable throughout a product's lifecycle, spanning design, production, consumption, and waste management. Various legislative acts, guidelines, and financing programs support the implementation of CE principles. The transition to a CE can occur at macro, meso, and micro levels, necessitating considerable time and investment. The European Union plays a pivotal role in promoting CE principles, as evident in documents from the European Commission mandating member states to undergo processes for transforming their economies. These documents emphasize monitoring CE progress through a designated framework, enabling comparisons between member states and facilitating the sharing of best practices. The analysis reveals that older EU member states (EU-14), particularly Germany, Belgium, the Netherlands, Spain, France, Italy, are more advanced in CE. Conversely, Malta, Cyprus, Croatia, Latvia, Ireland, and Greece exhibit lower CE advancement. Belgium and the Netherlands show significant upward trends in encouraging CE. Germany emerged as the most advanced in CE transformation, while the least advanced included Cyprus, Czechia, Malta, Lithuania, Latvia, Hungary, Ireland, Slovakia, Romania, Estonia, Croatia, and Bulgaria.

The varied CE progress across countries stems from differences in adopted development strategies, socio-economic disparities between EU-14 and EU-13 countries, and the effectiveness of implemented strategies. The study acknowledges certain limitations, including the existence of websites in multiple languages and variations in the articles found concerning advancements in the field of the circular economy. These factors contribute to the complexity of the analysis and may introduce nuances in the interpretation of the progress observed. As already

said, the European Union plays a pivotal role in disseminating the CE concept, publishing numerous CE-related documents and obliging its member states to undergo processes associated with transitioning their economies to a circular model. Effectively measuring and assessing activities undertaken to implement CE is crucial for its proper execution. Monitoring should extend to the progress of transformation towards CE and the efficiency of achieving CE goals at various levels, including macro, meso, and micro levels. The European Commission, in its commitment to advancing the Circular Economy, has devised a monitoring framework that undergoes continuous refinement. European countries, in a broader context, assume a pivotal role in this sector's development. However, it is imperative to acknowledge that there is still progresses to be made, particularly concerning aspects related to the concept of a just transition. Achieving a more comprehensive and inclusive circular economy requires further steps, with an emphasis on addressing social and economic justice considerations within the overarching framework of sustainable development.

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