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Enhancing Circular Economy Outcomes through Strategic Collaboration: Management Approaches for Policymakers, Business and Consumers

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Abstract

This chapter examines the transition to a circular economy through strategic collaboration among key actors: policymakers, businesses, and consumers. The circular economy is defined as a system that replaces the traditional linear "take-make-dispose" model with practices of reduction, reuse, recycling, and resource regeneration, aiming for sustainable development at micro, meso, and macro levels. The study provides a comprehensive review of governmental instruments, business activities, and consumer behavior relevant to circular practices. Governments create institutional and regulatory conditions through policies, financial incentives, public procurement, extended producer responsibility schemes, and public–private partnerships, enabling the transformation of business models. Businesses integrate circular principles through circular business model design, knowledge management, industrial symbiosis, and closed-loop supply chains, supported by digital technologies

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and innovation. Consumers, through conscious consumption, education, and the application of "R" strategies, further reinforce the circular economy. The aim of this study, based on this theoretical analysis, is to propose a conceptual framework that captures the dynamic interaction among policymakers, businesses, and consumers, illustrating how strategic collaboration can enhance circular outcomes. The framework will emphasize that circular cconomy performance emerges from interconnected regulatory, organizational, and behavioral mechanisms rather than from isolated interventions. The interaction among these three actors leads to resource optimization, increased reuse, improved value chain management, and the creation of economic and environmental value, highlighting the importance of continuous collaboration and dynamic feedback mechanisms for effective circular cconomy implementation.

5.1 Introduction

The circular economy describes an economic system based on business models that replace the concept of "end-of-life" with reduction, alternative reuse, recycling, and restoration of materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks), and macro level (city, region, nation, and beyond), aiming to achieve sustainable development, which involves creating environmental quality, economic prosperity, and social equity for the benefit of present and future generations (Geissdoerfer, 2020).

The circular economy emphasizes business models for reuse, repair, and recycling, and such a business model is expected to help shift the flow of products into a closed-loop system to reduce the high dependence on new natural resources (Nikolaou et al, 2021).

5.2 Literature Review

The transition from a linear to a circular economy represents a complex and systemic process that requires strong institutional support, regulatory interventions, and the active involvement of all relevant stakeholders. The literature clearly indicates that government policies, regulations, and legal frameworks play a crucial role in encouraging and implementing the principles of the circular economy. According to Kazancoglu et al., governments can influence corporate behavior by establishing environmental standards and legally binding obligations across industries, thereby creating a favorable environment for the adoption of circular practices (Kazancoglu

et al., 2021). Lewandowski, in turn, identifies the integration of the circular economy into existing environmental regulatory systems—together with financial instruments, technical support, and transparent monitoring mechanisms—as a necessary prerequisite for a successful transition (Lewandowski, 2016).

Zhang et al., in their study "Circular Economy Policies in China and Europe: A Systematic Literature Review", note that in the European context, the focus is placed on sustainable product policies, such as eco-design and Extended Producer Responsibility (EPR), implemented through a bottom-up approach involving multiple stakeholders (Zhang et al., 2025). Nevertheless, research highlights significant challenges related to the development of comprehensive, sector-specific, and regionally adapted policies. According to Wasserbaur et al., the transformation of business models, supported by appropriate government regulations, is considered one of the key instruments for accelerating the circular transition (Wasserbaur et al., 2022).

As part of governmental regulatory measures, Orazlin and Baydaleto emphasize Extended Producer Responsibility as an important mechanism for internalizing environmental costs throughout the entire product life cycle (Orazlin and Baydaleto, 2020). Contemporary approaches to EPR stress the need to redesign compensation schemes so that they incorporate all costs required to achieve circular economy objectives, including the gradual reduction of primary raw material use (Vermeulen et al., 2022). In this context, supply chain management emerges as a critical area for implementing circular principles, as policies promoting circular supply chains enable a shift from linear to closed-loop systems (Tong et al., 2024).

At the micro level, circular business models play a central role in integrating circular economy principles into corporate strategies. Thakuri et al., in their study *"*Digital Technologies Enabling Component Reuse in Circular Value Chains: Using Digital Twin, Internet of Things and Robots in Construction and Manufacturing Sectors*"*, indicate that business model innovations supported by digital technologies such as the Internet of Things, digital twins, and analytical tools enable improved resource management, component reuse, and optimization of value chains (Thakuri et al., 2024). Governance practices, corporate social responsibility, and transparent reporting further contribute to aligning economic and environmental objectives (Gorski and Badea, 2025).

Finally, the literature emphasizes that consumers play a fundamental role in the transition to a circular economy. According to Jourdain et al., circular behavior encompasses activities both before and after purchase, including the selection of eco-designed or refurbished products, as well as

their reuse, repair, and recycling (Jourdain et al., 2024). However, numerous barriers persist, such as insufficient awareness, price sensitivity, and cultural resistance to secondary products (Kirchherr et al., 2018; Camacho-Otero et al., 2019). Green attitudes, trust, and identification with circular products significantly influence purchase intentions, with Yang et al. and Duarte et al. highlighting education and awareness as key drivers of sustainable behavior (Yang et al., 2024; Duarte et al., 2024). In this context, Rejeb et al. note that neuromarketing has emerged as an innovative approach for better understanding the psychological and emotional aspects of sustainable consumption (Rejeb et al., 2020).

5.3 Policymakers: Circular Economy Governance and Policy Instruments

In the transition from a linear to a circular economy, government policies, regulations, and legal frameworks play an important role. Government actions are needed to develop circular economy practices, as the government can encourage companies to adopt circular economy policies by establishing environmental regulations for each industry (Kazancoglu et al, 2021). Therefore, the government should integrate circular economy legal arrangements into its existing environmental regulatory and legislative system. These regulations and support systems should include financial initiatives, technical assistance, incentive policies, collaboration platforms, and guidelines for monitoring and auditing within a transparent structure across the supply chain (Lewandowski, 2016). Governments can also promote circularity-based public procurement to foster related laws and implement circular business activities (Yuan et al, 2008).

Decision-making required to achieve government objectives in the field of the circular economy demands broader stakeholder involvement in the transition. This also includes redesigning the compensation structure within Extended Producer Responsibility (EPR) schemes, incorporating all costs necessary to meet circular economy goals, particularly the gradual phase-out of primary raw material use. This will result in higher and modulated financial incentives, depending on the distance from targets established by national and/or European circular economy policies (Vermeulen et al, 2022).

Europe places greater emphasis on "sustainable product" policies, such as eco-design and extended producer responsibility, relying more on multi-stakeholder collaboration through a bottom-up approach (Zhang et al, 2025). Challenges in Europe relate to difficulties in policy development, formulating sector and region-specific policies, as well as developing

comprehensive policies (Zhang et al, 2025). A key instrument for a successful transition to a circular economy is the transformation of business models and the formulation of supportive government regulations (Wasserbaur et al, 2022).

Local authorities facilitate the adoption of the circular economy by acting as a key intermediary between stakeholders, i.e., business actors, society, and other levels of government representatives (Anttiroiko, 2023; Nylén et al, 2024; Rincón-Moreno et al, 2022). They also provide financial incentives, infrastructure development, and technical assistance (Rincón-Moreno et al, 2022).

Extended Producer Responsibility (EPR) is a policy approach that holds producers accountable for the environmental impacts of their products throughout their lifecycle (Orazlin and Baydaleto, 2020). Supply Chain Management (SCM) is a critical area where businesses can integrate circular economy principles (Munonye, 2025). Policies promoting circular supply chains are crucial for encouraging businesses to redesign their value chains, transitioning from a linear "take-make-dispose" approach to a closed-loop system (Tong et al, 2024). Policies that provide financial incentives, such as tax relief or subsidies for companies using recycled materials, can help mitigate the higher costs associated with implementing circular supply chains (Hartley et al, 2020).

The circular economy requires changes in infrastructure, policies, and behaviors, all of which demand coordinated efforts from both the public and private sectors. Public-private partnerships (PPPs) serve as a strategic mechanism to bridge the gap between the financial and technical capacities of the private sector and the regulatory and policy frameworks of the public sector (Laplane, 2020). For PPPs to be effective, public and private entities must be able to work seamlessly together, sharing data, technologies, and processes that enable the smooth functioning of collaborative projects. The importance of interoperability lies in its ability to synchronize the goals and activities of both sectors, ensuring that innovations are deployed in a manner consistent with regulatory frameworks, policy priorities, and societal needs (Tanver et al, 2025).

Governmental synergy refers to a dimension in which industrial enterprises interact with state institutions at all levels—from national to local. In each industrial zone, there are numerous opportunities and challenges beyond the control of individual enterprises; for example, efficient transport infrastructure provided by the public sector can enhance competitiveness, while infrastructural constraints can reduce it. Therefore, a favourable government environment directly impacts the competitive potential of enterprises,

with efficient and effective public governance functions creating synergistic relationships between industries, policymakers, and shared infrastructure (Oughton et al, 2022).

Governments can include green economic incentives in their policies to encourage enterprises to increase their commitment to environmental sustainability (Clemens, 2006). These incentives can be financial or non-financial, aiming to ensure that the transition to a circular economy is more focused and sustainable (Koval et al, 2022). Furthermore, governments can implement prosocial and pro-environmental incentives as a strategic effort to promote environmental protection (Authelet, 2021). Conversely, such incentives can motivate enterprises to share knowledge and communicate about environmental issues (Guofeng, 2020).

Public procurement (PP) is a key economic activity of governments (Walker, 2012) and refers to the acquisition of goods and services by governments or public sector organizations through public contracts. It enables public sector organizations to carry out their functions and deliver their services (Kiver, 2014). During collaboration between procurement processes and circular economy business models, companies can gain experience in defining product or service specifications to close loops and optimize resource use at the product or service level (Mont, 2002). Such collaboration can provide experience for further partnerships between suppliers and procurers. This framework focuses on waste reduction, and consequently raw material reduction, by shifting from a product-focused approach to a product-service system where cycles are closed through refurbishment (Witjes, 2016). In this process, value generation shifts from a unit price to a service price (per functional unit). The successful outcome of the process depends on the collaboration between the procurer and supplier to determine both technical and non-technical specifications. Collaboration begins during the tender preparation phase rather than during the procurement phase (Witjes, 2016).

5.4 Circular Business Modes and Collaboration Mechanisms

Management and strategy play a crucial role in ensuring the effective implementation of circular initiatives and in enhancing corporate performance aligned with sustainability goals. In the process of developing and executing circular strategies that reduce negative environmental impacts and support long-term economic objectives, companies need to adopt effective managerial practices that align their goals with corporate sustainability principles (Gorski and Badea, 2025). Through the implementation of Corporate Social

Responsibility (CSR) frameworks and sustainability reporting, which integrate environmental, social, and governance factors, management can provide transparency regarding organizational initiatives, activities, and performance in both financial and non-financial domains (Gorski and Badea, 2025).

The key role of the business model is to embed circular economy principles into the design or redesign of business activities and partnerships, creating a cost and revenue structure compatible with both sustainability and profitability (Zuchella, 2018). Circular business model innovation can be defined as the conceptualization and implementation of circular business models, encompassing the creation of circular start-ups, diversification into circular business models, acquisition of circular business models, or transformation of an existing business model into a circular one (Geissdoerfer, 2020). End-of-life models enable the reduction of environmental impact for other companies by promoting circularity in the economy. Strategically, these models focus on reducing resource consumption and reusing materials, supported by digitalization and data management, appropriate technical infrastructure, and efficient inventory management. Revenue models are often service-based, linked to analytics and data (analytics-as-a-service and data-as-a-service), while the ultimate impact is reflected in material savings, increased reuse, and significant reductions in CO_2 emissions (Jonker, 2022).

Within the ecosystem, knowledge is exchanged and collaboration occurs among its actors, enabling a joint approach to important societal challenges. Knowledge, as an intangible resource, is crucial in creating organizational value (Krawczyk, 2022). Knowledge management can be applied in the ecosystem to incorporate sustainability dimensions and circularity principles from the early stages of product design (Weina and Yanling, 2022). This includes the creation, organization, accumulation, and sharing of knowledge among multiple stakeholders, encompassing actors from both the macro-environment and within the ecosystem itself. Knowledge content can originate both internally and externally, highlighting the holistic nature of knowledge management (Trzcielińska and Kaps, 2023).

Within the concept of the circular economy, Industrial Symbiosis (IS) represents a concrete and practical approach to operationalizing circularity at a larger scale. Industrial symbiosis involves the exchange of materials, energy, water, and by-products between spatially proximate or functionally linked industries, aiming to reduce waste and increase resource efficiency (Munonye, 2025). However, industrial symbiosis is not solely a technical solution; its success depends on complex inter-organizational coordination, trust-building, and appropriate institutional support. Industrial symbiosis is based on strategic collaboration among industries, where waste or by-products

from one process become valuable input resources for another, enabling the optimization of resource flows within interconnected networks (Munonye, 2025). Supportive industry synergy refers to a dimension where enterprises in the supporting industry, providing services within the broader industrial area, are intentionally located close to heavy or "primary" industries. They supply the materials and services needed by the primary industries and collaborate among themselves to deliver them at competitive prices (Oughton, et al, 2022). Supply chain management has been identified as one of the most critical factors for adopting circular economy principles (Govindan and Hasanagic, 2018), as the adoption of circular economy principles through supply chain management provides benefits in achieving more sustainable outcomes (Genovese et al, 2017).

The Closed-Loop Supply Chain (CLSC) involves the application of reverse logistics, where products are returned to the manufacturer to find more sustainable ways to reuse components (Guide and Van Wassenhove, 2006). The CLSC concept is the closest approximation to a Circular Supply Chain (CSC); however, its inherent limitation is that it focuses exclusively on reducing the amount of waste sent to landfills. A circular supply chain starts from the product design phase and includes end-users in adopting recycling and reuse practices (Khanna et al, 2024).

Data-driven modeling and analytics (Digital Twin), data collection and monitoring (Internet of Things [IoT]), and data-informed automation (robots) contribute to improving component reuse practices. These digital technologies enable opportunities to implement component reuse practices through knowledge optimization, planning optimization, and improved operationalization. They further offer benefits for circular system design for reuse, improved physical processes, enhanced management of circular value chains, economic value optimization, and innovation and development (Thakuri et al, 2024).

To fully realize the potential of the circular economy, it is imperative for businesses to adopt a strategic approach, focusing on innovation, collaboration, and continuous improvement. In doing so, they can contribute to global sustainability goals while ensuring their own economic sustainability (Shiva, 2024).

5.5 Circular Behavior and participation in Circular Economy

Consumers play a significant role in the transition to a circular economy. People use and consume products, and reported demand influences what is

produced globally. To achieve emission reductions through circular economy principles, consumption must be reduced and directed toward more sustainable, higher-quality, and longer-lasting products (Ostrowska and Krul, 2024). The forms of individual "R" strategies include refusal, rethinking, reduction, reuse, repair, refurbishment, remanufacturing, and recycling (Potting et al, 2018). Circular consumption behavior can be segmented into two categories: downstream activities and upstream activities (Shams et al, 2025). The downstream phase includes end-of-life activities for e-products. For example, donation, resale, and proper disposal are facilitated through circular R-strategies such as reuse/resale, repurposing, or recycling. These measures minimize e-waste creation, dispersion, and landfilling by closing the loops of e-products and their components. In this way, consumers can act as resource suppliers at the end of the supply chain (Jourdain et al, 2024). On the other hand, upstream activities involve the acquisition of e-products. This includes purchase decisions such as opting for second-hand or refurbished e-products, eco-designed e-products, and refusing to buy non-circular e-products. For this, consumers use R-strategies such as refusal, reduction, reuse, repair, or refurbishment (Jourdain et al, 2024).

In the pre-purchase phase, a lack of consumer awareness (Kirchherr et al, 2018), environmental interest (Ormazabal et al, 2018), and participation in the circular supply chain (Pasqualoto et al, 2023) influence behavior. Consumers' knowledge and awareness regarding refurbishment, as well as their perception of reused components, are limited, making the implementation of circular economy practices more difficult (Govindan, 2018).

In the purchasing phase, price increases are generally not appreciated by consumers (Scarpellini et al, 2019), and green purchasing behavior is uncertain (Masi et al, 2017). Customers prefer new products over reused or remanufactured components (Milios et al, 2019), and cultural barriers exist regarding consumer behavior toward "secondary/circular products" and the lack of acceptance of circular offerings by consumers and users (Camacho-Otero et al., 2019).

According to Morin (2011) and Rejeb (2020), neuromarketing is a new interdisciplinary field linking consumer behavior with neuroscience. As a novel concept in economics, neuromarketing combines multiple disciplines, including neuroscience, marketing, and psychology (Ulman et al, 2015).

Green attitude is the degree to which an individual perceives themselves as part of the natural environment, encompassing personal emotions and judgments toward environmental issues. It is beneficial for the conservation of the environment and natural resources (Jung et al, 2014). Green attitude is considered a key factor influencing consumers' intentions to purchase circular

economy products; it not only shapes their purchase decisions but also affects their consumption behavior, including repeat purchases and spending (Yang et al, 2024).

Awareness and concern for the environment are important antecedents of trust in circular economy products, attitude toward circular economy products, and identification with circular economy products. Both trust and attitude significantly influence commitment to circular economy products. Trust, commitment, and identification with circular economy products are key determinants of the intention to purchase circular economy products (Yang et al, 2024).

For consumers to engage in the circular economy, they must be informed (or educated) about it (Duarte et al, 2024). Consumer knowledge plays a fundamental role in driving behavior change toward circularity (Korsunova et al, 2023). When informed about the benefits of green energy, such as reduced resource depletion, minimized waste generation, and increased product longevity, consumers are more likely to make conscious decisions aligned with circular principles (European Environment Agency, 2022). Understanding consumer awareness and knowledge gaps around circularity can help identify areas for targeted education and awareness campaigns to improve consumer engagement (Duarte et al, 2024).

To enhance organizational sustainability and accelerate the overall transition to a circular economy, neuromarketing tools such as eye tracking and electroencephalography have the potential to analyze multiple aspects of consumer behavior regarding sustainable consumption (Pagan et al, 2020). By leveraging these marketing advancements, circular economy businesses can gain insights into the different emotions, psychological reactions, cognition, and behaviors of consumers (Rejeb et al, 2020).

5.5.1 Proposed conceptual framework for enhancing circular economy outcomes through strategic collaboration among policymakers, businesses, and consumers

This study proposes an integrated conceptual framework that explains how strategic collaboration among policymakers, businesses, and consumers enhances circular economy outcomes. Grounded in systems thinking, the framework conceptualizes the circular economy as a dynamic sociotechnical system in which regulatory structures, organizational practices, and consumer behavior interact to enable resource efficiency, value creation, and sustainable development.

At the core of the framework lies the premise that circular economy performance cannot be achieved through isolated actions, but rather through coordinated, multi-actor engagement across the value chain.

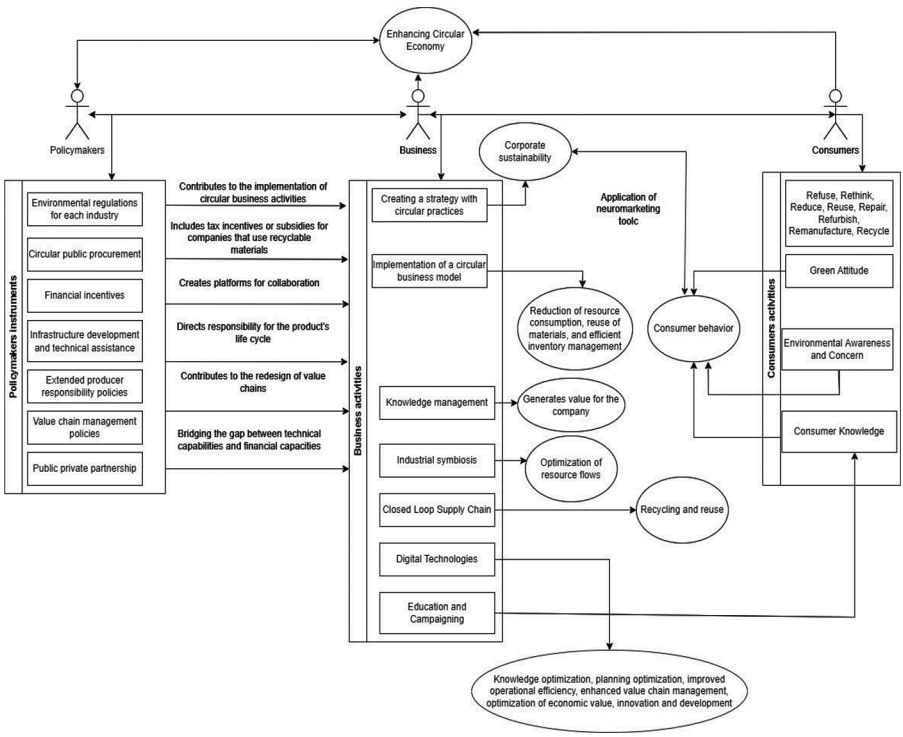

Figure 5.1 Conceptual Framework for enhancing Circular Economy outcomes through strategic collaboration among Policymakers, Businesses, and Consumers. Source: Authors' elaboration.

The proposed framework conceptualizes the circular economy as a dynamic system shaped by the strategic interaction of policymakers, businesses, and consumers, whose coordinated actions collectively contribute to the enhancement of circular outcomes. The model adopts a systems-thinking perspective, emphasizing that circular economy performance emerges from interconnected regulatory, organizational, and behavioral mechanisms rather than from isolated interventions.

Within the framework, policymakers play a foundational enabling role by establishing the institutional and regulatory conditions necessary for the

adoption of circular practices across industries. Policy instruments such as environmental regulations, circular public procurement, financial incentives, infrastructure development, extended producer responsibility schemes, value chain management policies, and public–private partnerships reduce uncertainty and align economic incentives with sustainability objectives. These instruments contribute to the implementation of circular business activities by encouraging the use of recyclable materials, facilitating collaboration platforms, assigning responsibility for product life cycles, and supporting the redesign of value chains. Through these mechanisms, policy interventions act as catalysts for organizational transformation toward circularity.

Businesses occupy a central position in the framework, translating policy signals and consumer expectations into strategic and operational circular practices. The model highlights the importance of integrating circular principles into corporate strategy and implementing circular business models supported by knowledge management, industrial symbiosis, closed-loop supply chains, and digital technologies. These practices enable firms to reduce resource consumption, increase material reuse, and improve inventory and resource flow efficiency. Education and awareness campaigns further support the diffusion of circular practices by shaping stakeholder understanding and engagement. Collectively, these business activities contribute to corporate sustainability by generating economic value, fostering innovation, and improving environmental performance, thereby reinforcing companies' long-term competitiveness within a circular system.

Consumer behavior represents a critical mediating dimension within the framework, influenced by both business-driven interventions and individual-level characteristics. Through education, communication strategies, and the application of neuromarketing tools, businesses shape consumer perceptions and decision-making processes, encouraging pro-environmental consumption patterns. Consumers' green attitudes, environmental awareness, and knowledge play a decisive role in determining engagement in circular practices, including refusal, rethinking, reduction, reuse, repair, refurbishment, remanufacturing, and recycling. Active consumer participation strengthens circular business models by creating demand for sustainable products and services and by supporting recycling and reuse processes that close material loops.

The interaction between business practices and consumer behavior leads to operational outcomes such as reduced resource consumption, optimized resource flows, efficient inventory management, and enhanced recycling and reuse. These outcomes generate value for firms while simultaneously contributing to broader circular economy objectives. At the system

level, the cumulative effects of coordinated policy support, circular business implementation, and responsible consumer behavior result in knowledge optimization, improved planning and operational efficiency, enhanced value chain management, economic value optimization, and increased innovation and development.

The framework further acknowledges the presence of feedback mechanisms, whereby improved circular economy outcomes reinforce policy learning, strategic business adaptation, and consumer awareness. In this way, the model captures the dynamic and iterative nature of the circular economy transition, highlighting the importance of continuous interaction and collaboration among key stakeholders.

By integrating policy instruments, managerial practices, and behavioral factors into a single analytical structure, the framework provides a comprehensive explanation of how strategic collaboration can effectively enhance circular economy performance.

5.6 Conclusion

The transition to a circular economy represents a complex and multidimensional process that requires the coordinated action of policymakers, businesses, and consumers. Governments play a pivotal role in creating a supportive institutional and regulatory environment that encourages the adoption of circular practices across industries. Policy instruments, including environmental regulations, public procurement policies, extended producer responsibility schemes, financial incentives, and public–private partnerships, act as enablers, aligning economic incentives with sustainability objectives while reducing uncertainty for businesses. By integrating these mechanisms into existing governance frameworks, governments can facilitate innovation, promote collaboration, and accelerate the systemic adoption of circular practices.

Businesses are central to operationalizing the circular economy, translating policy directives and market signals into tangible strategies and practices. The adoption of circular business models, supported by knowledge management, industrial symbiosis, closed-loop supply chains, and digital technologies, enables firms to optimize resource flows, reduce material consumption, and increase the efficiency of production and distribution processes. Strategic alignment of business models with sustainability objectives fosters long-term competitiveness while simultaneously contributing to environmental and social goals. Furthermore, collaboration between businesses and other ecosystem actors, including suppliers, research institutions, and

industry associations, strengthens the collective capacity to innovate and implement circular solutions.

Consumers serve as both drivers and enablers of circular practices, with their behavior influencing production, consumption, and end-of-life management of products. Education, awareness campaigns, and the application of neuromarketing and communication tools can shape consumer perceptions and encourage pro-environmental behavior, including reduction, reuse, repair, refurbishment, and recycling. Active consumer participation not only supports the creation of demand for circular products and services but also completes the material loops essential for the functionality of the circular economy.

The interaction among policymakers, businesses, and consumers generates cumulative outcomes that extend beyond individual actors. These include optimized resource utilization, enhanced operational and supply chain efficiency, improved environmental performance, and strengthened economic value creation. Dynamic feedback mechanisms within the system, such as policy learning, strategic business adaptation, and growing consumer awareness, reinforce circular outcomes and ensure the iterative improvement of practices.

Ultimately, achieving the full potential of the circular economy requires a systemic, integrated, and adaptive approach. Continuous collaboration, innovative business strategies, comprehensive policy support, informed consumer engagement, digital transformation, and robust infrastructure are all critical components. By embracing these elements, stakeholders can collectively advance sustainability, reduce environmental pressures, and create resilient economic and social systems that benefit present and future generations.

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