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Systemic Transition from a Linear to a Circular Model in the Context of Business Environment Transformation

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Abstract: The study analyses structural changes in global resource use and identifies the key factors shaping the shift toward circularity under current environmental and economic pressures. Drawing on international analytical assessments and global material flow databases, the study analyses long-term trends in resource extraction, domestic material consumption and circularity indicators. The findings reveal a persistent dominance of primary material use and a decline in the global circularity rate, indicating that the expansion of primary extraction continues to outpace the development of secondary material flows. Significant regional disparities in material consumption patterns further demonstrate that the feasibility and pace of the circular transition vary substantially across world regions. The study identifies three systemic barriers constraining the shift to circularity: the underestimated potential of the bioeconomy, continued dependence on fossil fuels and the rapid accumulation of long-lived material stocks. These factors generate structural inertia that reinforces linear pathways and delays future circularity. The article shows that current business models insufficiently integrate repair, reuse, high-quality recycling and service-based value creation, which limits the formation of secondary resource markets and slows reductions in material intensity. The research also develops a structured model of government–business interaction, demonstrating that a successful circular transition requires coherent policy frameworks, international coordination, digital monitoring systems and strong corporate engagement. Key priorities include slowing the growth of material stocks, extending asset lifetimes, expanding regenerative biomass use, strengthening secondary material markets and establishing a global system for resource governance. The findings confirm that only a coordinated transformation of institutional mechanisms, economic incentives and business strategies can ensure a meaningful transition toward a circular economy and support long-term socio-ecological resilience.

Keywords: circular economy; green transition; global material flows; material stocks; secondary resources; sustainable business; resource efficiency; waste management; bioeconomy; digitalization.

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Introduction

Ensuring human well-being within the ecological limits of the planet has become a central challenge for contemporary societies. Modern economies are expected to support high living standards while protecting and restoring the natural systems. In contrast, the current linear model of extraction, production, consumption and disposal no longer matches the environmental and socio economic realities of the twenty first century. This model accelerates resource depletion, intensifies environmental degradation and increases systemic vulnerability.

The circular economy has emerged as a strategic framework that can reduce material pressures and support long term resilience. Circular practices such as reuse, repair, remanufacturing and high quality recycling allow societies to decrease material throughput while maintaining or even enhancing quality of life. Moreover, these practices can also contribute to climate mitigation, biodiversity conservation and more stable patterns of development. The transition from a linear to a circular system, however, requires coordinated changes in policy, governance, market incentives and business strategies. It involves a comprehensive redesign of how value is created, delivered and maintained within economic systems.

The findings of international analytical reports demonstrate the growing urgency of systemic change. Global extraction of materials has more than tripled during the past five decades and now exceeds 100 billion tonnes each year (Wiedenhofer et al., 2024). Per capita material consumption increased from 8.4 tonnes in 1970 to 12.2 tonnes in 2023, mostly as a result of urbanisation, higher levels of income and expanding infrastructure *(International Resource Panel, 2024a)*. Without significant intervention, material extraction may rise by an additional 60 percent by 2060 (International Resource Panel, 2024a). Material use is responsible for almost two thirds of global greenhouse gas emissions and for more than 90 percent of biodiversity loss and water stress (International Resource Panel, 2024b). In 2023 the scientific community confirmed that humanity had already exceeded six of the nine planetary boundaries, which makes the current trajectory of development incompatible with long term ecological and social stability *(Richardson et al., 2023)*. The importance of a systemic approach to the transformation of business processes in the context of the circular transition is consistent with studies that emphasise the role of hidden (implicit) factors in organisational management and their influence on the effectiveness of business models *(Hushko et al., 2018)*. The shift toward a circular model also requires recognising the strategic role of innovation and the development of renewable energy, which constitute key drivers of sustainable development and form the basis for resource-efficient approaches across various economic sectors *(Lukashevych et al., 2024)*.

It should be noted that reliable indicators and baseline metrics play an essential role in guiding transition to circularity *(Hushko & Bay, 2025)*. At the same time, policymakers and businesses require operational tools that can translate conceptual models into practical action.

Additionally, the transition to a circular model is increasingly shaped by rapid changes within the business environment. Companies operate in conditions characterised by resource price volatility, technological disruption, geopolitical uncertainty and expanding regulatory requirements. Furthermore, investors and consumers increasingly expect transparent, responsible and low impact business practices *(Henriques et al., 2023; Maksymova, 2024)*. Companies are therefore rethinking product design, supply chain management and modes of value *creation (Blomsma et al., 2024; Di Stefano et al., 2023)*. Circular business models are gaining strategic relevance because they reduce exposure to resource risks, increase operational efficiency and support long term competitiveness.

In this context the circular economy should be viewed as a comprehensive transformation of economic systems. It is not limited to waste management or efficiency improvements. It involves a systemic reorganisation of how resources are used and how business sectors respond to ecological constraints. Successful implementation requires evidence based policy, institutional coordination and adaptive business strategies that can support the transition from linearity to circularity under conditions of global change.

Materials and Methods

The research is based on a combination of quantitative and qualitative methods aimed at identifying structural patterns in global material flows and assessing the systemic factors that shape the transition from linear to circular economic models.

Stage 1. Analytical Framework and Data Sources. The empirical analysis relies on open global datasets, including the International Resource Panel Global Material Flows Database, the Circularity Gap Report metrics, as well as regional material consumption indicators published on public statistical platforms (Our World in Data, UNEP resource dashboards). These sources provide harmonized time series on extraction, material use, domestic material consumption per capita, biomass composition, fossil resource dependence and circularity levels. The structure of global material flows is examined through a three-component model distinguishing circular, linear and potentially circular flows. This framework allows evaluation of secondary material supply, primary resource dependence, and the long-term accumulation of material stocks.

Stage 2. Quantitative Methods. Descriptive statistical analysis is applied to identify long-term trends in global extraction volumes, changes in circularity rates and regional differences in domestic material consumption. Comparative analysis is used to assess disparities between world regions and sectors. Structural decomposition of input and output flows enables examination of the balance between primary extraction, secondary materials, biomass and waste generation.

Stage 3. Qualitative Methods. A problem-oriented analytical approach is employed to identify systemic barriers in the circular transition. This includes expert interpretation of the roles of bio-transition, fossil-fuel dependency and stock accumulation based on international scientific assessments. To evaluate the interaction between governments and businesses, a comparative institutional analysis is used. This approach enables the identification of policy gaps, coordination failures and opportunities for scaling circular practices across sectors.

Overall, the combination of multi-source data, structural analysis and integrated methodological approaches provides a comprehensive basis for examining the dynamics of material use, evaluating circularity challenges and identifying strategic directions for business-environment transformation.

Results

The analysis of global material flows shows that the current economic system is unable to secure long term well-being within safe ecological limits. This finding reinforces the growing need for a systemic transition from linear to circular models of production and consumption. The circular economy provides an alternative to established linear practices that no longer align with the requirements of societies or the capacities of natural ecosystems. Over the past seven years the share of secondary materials in total material use has become a widely recognized indicator of progress toward circularity, as reflected in the Circularity Gap Report. This metric offers an important benchmark, although it represents only one component of a much broader material system. Furthermore, domestic material consumption per capita illustrates how different parts of the world continue to rely on highly material intensive development pathways, reflecting structural inequalities in economic models, industrial composition and resource dependency. These differences are particularly relevant in the context of a systemic transition, as the feasibility and pace of moving from linear to circular models vary significantly across regions (Fig. 1).

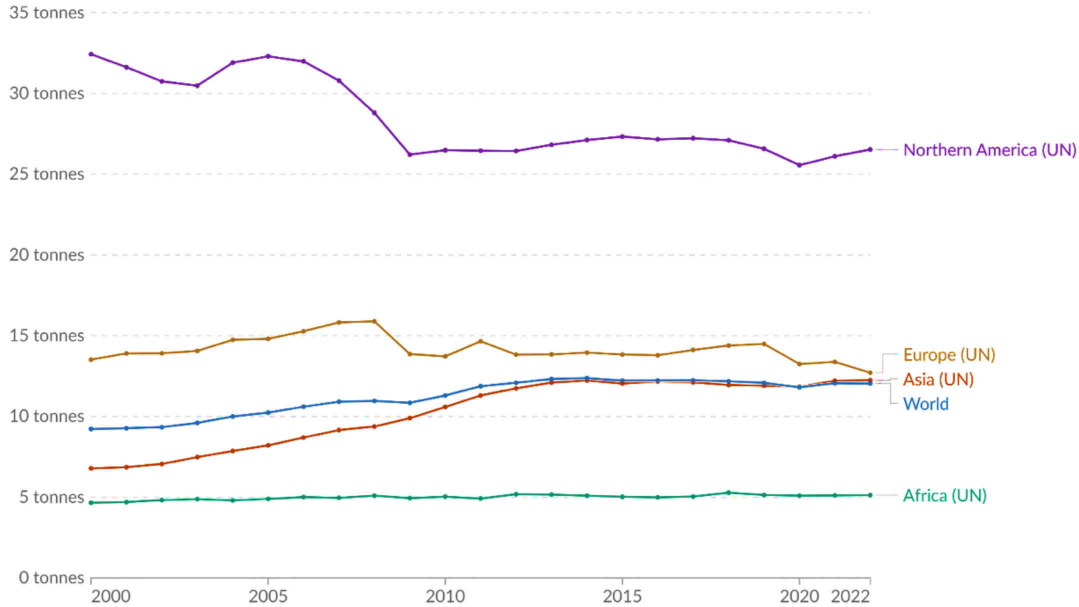


Figure 1. Domestic material consumption per capita across world regions
Source: Compiled in ourworldindata.org dashboard

Material flows that enter, circulate within or leave the global economy can be grouped into three categories. Each category reflects distinct patterns of resource use and reveals specific barriers and opportunities for circular transformation (Fig. 2).

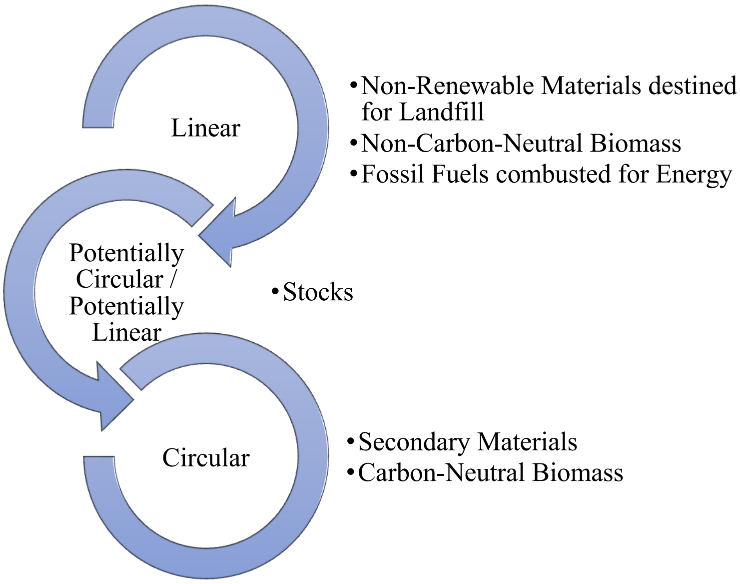


Figure 2. Structure of Material Flows in the Transition from a Linear to a Circular Economy
Source**:** Circularity Gap Report (Circle Economy, 2025)

The diagram distinguishes three categories of material flows. Each category represents a specific role within the broader system of resource use.

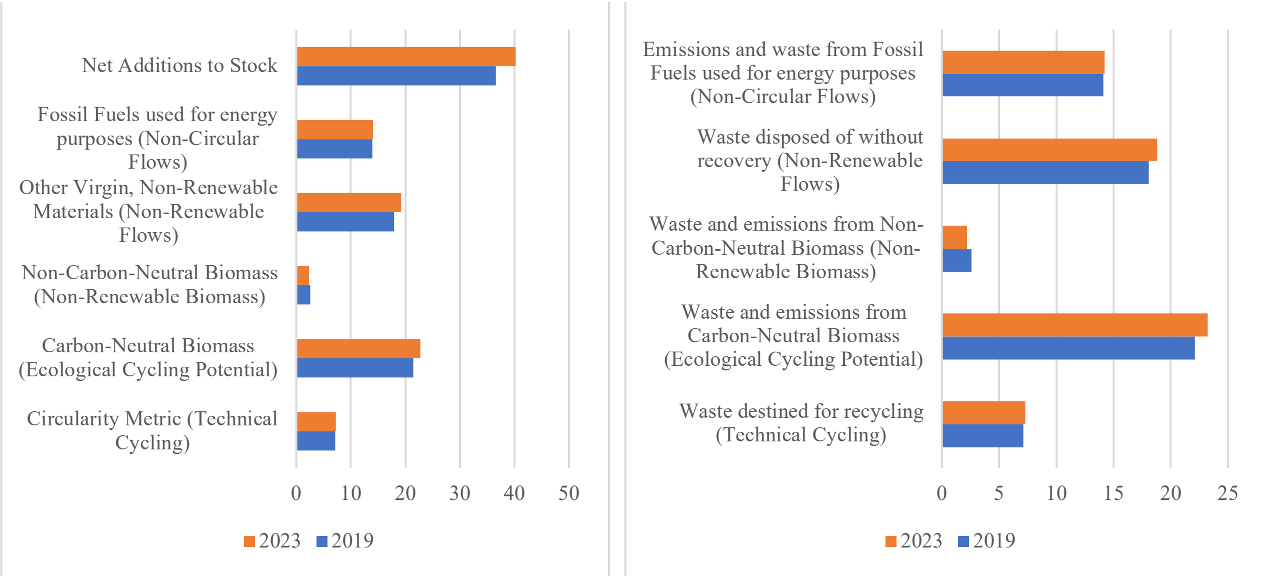
The first category includes circular flows. These consist of two types of materials. The first type includes secondary materials, which originate from recovered or recycled resources that can re-enter production systems. The second type includes carbon neutral biomass, which is derived from biological resources that maintain a balanced carbon cycle through natural regeneration. Both groups contribute to circularity by supporting material efficiency and reducing waste.

The second category includes linear flows. These flows represent materials that do not return to productive use. They include non-renewable materials that are sent to landfill, non-carbon neutral biomass, and fossil fuels used for energy production. These flows reflect the logic of the conventional linear economy. They indicate continued dependence on extraction and disposal. Their presence highlights the persistence of unsustainable resource use patterns.

The third category includes flows that are potentially circular or potentially linear. This group consists of material stocks such as buildings, infrastructure, equipment and machinery. These stocks accumulate over long periods of time. They may become valuable sources of secondary materials if recovered in the future. They may also become large waste streams if recovery systems and technologies remain insufficient. Their trajectory depends on design choices, waste management practices and policy interventions.

The diagram also demonstrates that circularity relies on the expansion of secondary materials and balanced biomass use. Linear flows and material stocks remain critical points of intervention for policymakers and businesses that seek to accelerate the shift from linear to circular models. Potentially circular flows originate from long term material stocks. Some of these stocks may become sources of secondary materials in the future, while others may be lost if recovery systems are not sufficiently developed. Their role depends on design choices, technological progress and policy measures that influence how materials are managed at the end of their service life.

The results indicate that global material cycles remain predominantly linear (Fig. 3).



a) Input flows, billion tonnes *b) Output flows, billion tonnes*

Figure 3. Linear via Circular flows balance
Source: author's development based on database (International Resource Panel, 2024a)

The most recent analysis shows a further decline in the global circularity rate. The majority of materials entering the world economy continue to originate from primary sources, while the share of secondary materials decreased from 7.2 percent to 6.9 percent. This confirms that the use of primary resources is growing much faster than the availability of secondary inputs. The expansion of primary extraction is therefore outpacing the development of circular material flows.

The share of secondary materials is too small to ensure a stable material balance, and large additions to stocks create a delay in future circularity that may last for decades. This structural inertia limits the pace of transition. At the same time, a clear understanding of the relationships among the three categories of material flows makes it possible to identify policy, economic and technological interventions that can accelerate the shift towards a circular economy at the global level. The development of reliable indicators is essential for guiding decisions, monitoring progress and supporting systemic transformation within the business environment and across economic systems.

The persistent increase in total material consumption is a central factor behind the falling circularity rate. Although the absolute volume of secondary materials is rising slowly, it remains too small to balance the rapid growth in primary resource use. Global material extraction has more than tripled over the past fifty years and has recently exceeded one hundred billion tonnes per year. If systemic changes are not introduced, this figure is expected to grow by another sixty percent by 2060 *(Soonsawad et al., 2024)*. These trends indicate that the global economy is still deeply rooted in linear resource use, which limits the potential for a transition towards a circular model and increases long term environmental pressures.

Achieving a genuinely circular model of development requires a substantial reduction in the material intensity of the global economy. This transition demands a deep restructuring of production and consumption systems, which directly affects how businesses create value, manage resources and interact with supply chains. Firms in construction, transport and manufacturing operate within sectors with high material dependency, and their transformation is essential for closing material loops. Without business adoption of circular principles and investment in redesigning operations, the shift from linear to circular models will remain incomplete.

There is also a considerable untapped potential for increasing circularity through the recovery of materials that could technically be returned to productive use but are not yet captured by existing business practices. A large share of primary non renewable resources that end up in landfill reflects not only technological barriers but also gaps in corporate collection systems, reverse logistics and economic incentives. These materials include heavy industrial residues, short lived consumer goods and end of life machinery. If businesses integrated stronger take back schemes, adopted circular procurement and invested in recycling infrastructure, the share of secondary materials could rise to approximately 25 percent *(Mallick et al., 2023)*. This demonstrates the scale of unrealised opportunities within global value chains.

Additional opportunities for higher circularity are associated with improved management of construction and demolition waste and the recovery of smaller material streams such as municipal solid waste. Many companies still face difficulties processing complex waste fractions that include mixed building debris and contaminated soils. These challenges reflect limitations in current business models, which often prioritise low cost disposal over long term resource efficiency. The situation underscores the need for corporate strategies that minimise waste generation at the design stage, extend product lifetimes and support high quality reuse and recycling wherever this is technologically and economically feasible.

In an ideal circular model societies would rely mainly on secondary materials while decreasing the extraction of primary resources and overall material demand. Achieving such a system requires businesses to embrace principles of material efficiency and sufficiency, prioritise recycled inputs and integrate circular design across product development cycles. Long lived stocks such as buildings and infrastructure would be managed as material reservoirs, enabling future recovery through industrial symbiosis, digital tracking and circular business platforms. At the national level governments would strengthen systems of collection, recycling and waste treatment, while businesses would play a central role in reducing resource losses along supply chains from extraction to end of life.

These systemic trends have direct implications for the business environment. Companies operate under increasing pressure from regulators, investors and consumers to reduce environmental impacts, improve transparency and adopt circular practices. Circular strategies allow firms to enhance resilience, increase operational efficiency and create new forms of value through services, reuse, refurbishment and remanufacturing.

At the same time businesses encounter persistent barriers such as:

- high upfront costs,
- technological uncertainty,
- limited market demand for secondary materials,
- fragmented regulatory frameworks.

These challenges shape the pace of the linear to circular transition and highlight the need to identify the most pressing problems faced by companies in the contemporary business environment.

Consequently, key problems in the “Linear to Circular Transition” should be delineated.

Problem 1. Limited understanding of the role of the bio-transition in business environment and global economy as a whole.

An important aspect is that biomass represents a substantial share of global material flows, with 21.5 percent classified as carbon neutral and 2.2 percent as non carbon neutral *(Vitunskienė et al., 2022)*. Yet its contribution to the circular transition remains significantly underestimated. Formal carbon neutrality does not reflect the wider environmental impacts associated with biomass extraction, including soil degradation, biodiversity loss, ecosystem disruption and imbalances in nutrient cycles. It also remains uncertain whether nutrients are returned to the biosphere at the required scale and speed to ensure ecological regeneration.

Although the share of non carbon neutral biomass is relatively small, it still accounts for almost one tenth of total biomass use and remains essential to minimise. Biomass extraction has more than doubled over the past fifty years, driving land use change, agricultural expansion and additional global emissions. A sustainable circular transition will require a profound transformation of food systems and business models across agriculture, food processing and retail. Reduced dependence on intensive agriculture and greater adoption of regenerative and plant based solutions will be necessary. These changes imply significant shifts in corporate supply chains, product design, sourcing strategies and investment priorities.

Problem 2. Persistent dependence on fossil fuels and weak incentives for phase out by national economies and business.

Despite a relative decline in the share of fossil resources within total extraction, their absolute volumes continue to rise. Global fossil fuel extraction increased from 6.1 billion tonnes in 1970 to 15.8 billion tonnes in 2022, while fossil resources account for 13.3 percent of the materials entering the global economy and remain a central driver of the climate crisis (Boehm et al., 2023). Energy sector generates 73 percent of global greenhouse gas emissions, excluding land use and land use change. Fossil fuels still provide 82 percent of the world's primary energy supply and convergence of this processes remains unstable *(Krysovatyy et al., 2024)*.

The demand for fossil energy has historically been coupled with economic growth, and this dynamic continues to shape business behaviour. Fossil fuel use is supported by artificially low prices and large public subsidies that reached an estimated 1.2-1.5 trillion USD in 2025. Moreover, associated environmental externalities are estimated at USD 10.5–22.6 trillion per year, highlighting the true *hidden costs* of fossil fuel use *(Reyes-García et al., 2025)*. These conditions create strong disincentives for companies to transition toward low carbon energy systems.

A shift to net zero energy opens the possibility of reducing fossil fuel dependence, but it requires a deep transformation of transport, energy and industrial infrastructure. This transition will be material intensive. However, thoughtful design and strategic decisions by businesses can significantly reduce long term material needs. Practices that prioritise durability, repairability and high quality recycling will be essential for minimising the environmental impact of new infrastructure and technologies. Unlike the current model that relies on continuous expansion of fossil extraction, circular principles allow businesses to reduce both present and future pressures on natural systems.

Problem 3. Excessive accumulation of material stocks as a major driver of resource extraction.

The rapid growth of material stocks such as buildings, infrastructure, vehicles and machinery has become one of the strongest factors driving global resource extraction. Today 38 percent of all materials entering the world economy are primary resources added to long term stocks (*Wiedenhofer et al., 2024)*. These stocks largely consist of non metallic minerals and metals that support urban development and industrial systems. While material stocks are not inherently negative, their formation is highly material intensive.

The total mass of global material stocks increased twenty three times over the twentieth century and continues to rise alongside urbanisation and economic growth. By 2050 urban populations will expand by an additional 2.5 billion people, primarily in low and middle income countries *(Plank et al., 2022)*. This shift will require significant new material inputs. For these countries there is a critical opportunity to embed circular principles at an early stage of development and to avoid inefficiencies that characterised the expansion of advanced economies. For high income countries with already extensive material stocks the priority shifts toward minimising new material inputs, extending asset lifetimes, modernising existing structures and promoting reuse, renovation and repair.

These trends have direct implications for business. Companies involved in construction, manufacturing, logistics and infrastructure provision must redesign their operations to manage material stocks more efficiently. They need to invest in circular design, digital material passports, modular construction and reverse logistics systems. By treating material stocks as future resource reservoirs businesses can create new value streams while reducing extraction pressures and improving resilience.

The analysis of these three systemic problems demonstrates that the global economy remains structurally dependent on linear patterns of resource use. Material stocks continue to expand, fossil fuels still dominate energy systems and the potential of the bioeconomy remains insufficiently explored. These dynamics increase long term environmental pressures and slow the shift towards a circular model. At the same time they reveal clear points of intervention where targeted actions by governments and businesses can accelerate the transition. Based on the evidence presented above, several strategic directions can guide more effective decision making.

First, it is essential to limit the growth rate of material stocks. Governments and businesses need clear global and national targets that define acceptable levels and growth dynamics in construction and infrastructure. Without such targets it is difficult to manage material intensity or address ecological risks in a timely manner.

Second, priority should be given to extending the lifetimes of existing assets. Repair, refurbishment, retrofitting and modernisation should become standard practices. These measures reduce the demand for new materials and lower the overall pressure on resource systems.

Third, material stocks should be designed for durability and circularity. Buildings and infrastructure must be created in ways that enable easy repair, disassembly and high quality recycling at the end of their service life. Such design choices support long term availability of secondary materials.

Fourth, the use of renewable and low impact materials should be expanded. Stocks should increasingly incorporate sustainable timber, biocement and biocomposites, provided that their production and use comply with circularity principles.

Fifth, operations should be localised where possible in order to reduce energy consumption. Local production and construction processes minimise transport distances, lower logistical emissions and improve the overall efficiency of material flows.

Sixth, both existing and new material flows must be optimised through circular design. Integrating circular principles at the earliest design stages helps prevent unnecessary stock growth and ensures that materials are used efficiently across multiple life cycles.

A successful transition from a linear to a circular economic model requires coordinated action from both governments and businesses. Each actor plays a distinct yet interdependent role in shaping the enabling conditions, implementing circular practices and scaling system level changes (Table 1).

Table 1. Role of Business and Government in the Systemic Transition to a Circular Economy

Actor	Strategic Role	Key Actions
Governments	Leadership for circular transition	National circularity vision; multilateral cooperation; tax shift to circular models; redirecting subsidies; public funding for innovation
	International coordination	Managing global material flows; participation in international agreements; establishing international resource governance
	Monitoring and accountability	Circularity indicators; national targets; data-based policy adjustment
Business	Operational and supply chain circularity	Material recovery; local supply chains; service-based business models; measuring circularity
	Resilience and risk reduction	Reducing exposure to resource scarcity and geopolitical instability; lowering dependence on volatile global markets
	New markets and competitiveness	Service-based revenue models; proactive adaptation to regulation; leadership in digital and low-carbon technologies
	Sector-wide scaling	Transparency; industrial symbiosis; collaboration with governments

Source: constructed by the author

Governments hold a critical opportunity to lead the global transition toward a circular economy by establishing coherent policy frameworks and enabling transparent multilateral cooperation. Clear long term visions, consistent support for circular initiatives and fair market conditions are essential for creating an environment in which circularity can expand. Key actions include shifting the tax burden from linear to circular models, redirecting subsidies away from resource intensive sectors and allocating public financial flows to circular projects and innovation. These measures influence not only national development strategies but also the broader business environment in which companies operate.

However, yet no country can address resource overuse in isolation. Effective transition requires strong international coordination and, where possible, joint action to manage global material flows. Despite increasing awareness of planetary limits, the current global landscape lacks clear targets and does not possess a governance structure capable of systematically tracking resource use worldwide. This institutional gap limits the ability of both governments and businesses to align their actions with long term sustainability goals.

An international institution dedicated to resource governance could provide science based assessments, policy recommendations and reliable benchmarks. Emerging negotiations on a global agreement on plastic pollution illustrate the relevance of such mechanisms. At the national level governments should select and monitor robust indicators similar to those discussed in this report, ensure transparency and adjust policy based on new data. Reliable monitoring systems strengthen accountability and create predictable conditions for businesses planning circular investments.

Business plays an equally important role in the transition. Companies that adopt circular strategies, such as material recovery, closed loop production models and localised supply chains, can reduce exposure to volatile global markets and lower operational risks. To maximise the effectiveness of these actions firms must consider not only their internal operations but also the broader context of circularity reflected in global indicators. Transparent reporting on progress can accelerate the spread of circular practices across sectors.

Collaboration among companies is essential. Knowledge exchange, industrial symbiosis, the development of service based business models and close cooperation with governments help overcome systemic barriers and support the creation of circular markets. Firms that already implement circular practices can gain a competitive edge by securing new revenue streams, improving resilience to resource scarcity and reducing vulnerability to geopolitical disruptions. In an increasingly unstable global economy companies that anticipate regulatory shifts and lead the transition can not only adapt to emerging conditions but also contribute to shaping large scale circular systems.

Conclusions

Despite intensive proclamation of the green course, the global economic landscape remains structurally linear, as demonstrated by the persistent dominance of primary resource extraction and the decline in the global circularity rate from 7.2% to 6.9%. This indicates that the growth of primary material use continues to outpace the development of secondary material flows, undermining progress toward climate neutrality and long-term resource efficiency. The analysis of domestic material consumption per capita across world regions reveals pronounced inequalities in material-intensive development pathways. High levels of resource use in North America and Europe, combined with rapidly increasing DMC in Asian economies, indicate that the feasibility and pace of circular transition remain highly uneven across global regions and require differentiated policy approaches.

Additionally, the structure of global material flows illustrates the strong predominance of linear flows and the limited contribution of circular flows to the global material balance. Potentially circular flows (long-term material stocks in buildings, infrastructure and machinery) represent the largest share of accumulated materials and may become future waste streams if recovery systems and circular design principles are not strengthened. The balance of linear versus circular flows confirms that more than 90% of materials entering the global economy are either added to long-lived stocks or lost as waste. Such structural inertia creates a “circularity delay,” whereby decisions made today in construction, infrastructure and industrial systems will determine the availability of secondary materials for decades.

The limited integration of secondary materials into business operations constrains opportunities for circularity. Despite the technical potential to raise recycling rates to approximately 25%, insufficient collection systems, weak market incentives and a lack of circular product design maintain high dependence on primary resources.

The rapid accumulation of material stocks has become one of the principal drivers of resource extraction. With 38% of all extracted materials annually added to long-term stocks, circular transition strategies must prioritise lifetime extension, renovation, modularity and repurposing, especially in highly urbanised economies with saturated infrastructure systems.

A successful circular transition also requires a deeper transformation of the bioeconomy. Although biomass accounts for a significant share of global material flows, its circular potential remains underutilised. Regenerative agricultural practices, circular food systems and resource-efficient biomass management must become core elements of business strategies to reduce land degradation, biodiversity loss and nutrient imbalances.

The conducted research highlights that the transition to a circular economy is feasible only through coordinated action between governments and businesses. Governments provide the institutional framework (such as circularity indicators, tax reforms, subsidy alignment, international coordination and data-driven policymaking) while businesses operationalise circularity through material recovery, service-oriented models, localised supply chains and industrial symbiosis.

Circular practices significantly enhance business resilience by reducing exposure to resource price volatility, geopolitical disruptions and supply chain instability. Firms that transition to reuse, repair, remanufacturing and service-based value creation gain long-term competitive advantages, while those dependent on primary extraction increase their operational and strategic risks.

The systemic transition from a linear to a circular model requires the establishment of an international governance mechanism for global material flows. The absence of a global authority setting resource targets, monitoring extraction and consumption, and harmonising policy efforts creates fragmentation and slows corporate investments in circularity. A coherent international resource governance system is therefore a critical precondition for large-scale business environment transformation.

Conflicts of interest

The author declares that there is no conflict of interest.

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