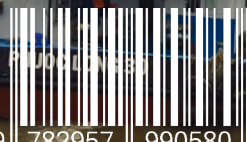


INTERSECTING

VOLUME 08/2022

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“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.”

—Alvin Toffler (1980)

That our world is growingly complex is hardly a radical revelation. The challenge is to act accordingly. To widen our knowledge, we specialize and consequently isolate ourselves in various silos.

In face of overwhelming evidence of our interrelatedness and interdependencies, from our bodies to our environment and our actions within it, we have no other choice than to work at the edges and at the crossroads.

INTERSECTING cuts through strategic policy areas from high-income and low-income countries. It builds upon multi-sectoral, multi-disciplinary, and multi-stakeholder approaches.

INTERSECTING is distributed by the Global Solutions Initiative. It is geared towards think tanks, civil organizations, international institutions, in particular the G20/T20. It addresses established and future generations of leaders in public and private spheres.

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Bending the Linear Economy
On Value Chains

#capital #development #agenda 2030

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VOLUME 08/2022

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Image Source: Ships on the Sai Gon River near Thao Dien, Ho Chi Minh City, Vietnam. While the river continues to serve as an important logistical artery, its banks in the city center are being rapidly transformed, particularly through investment in dense high-rise housing developments. More man-made areas lead to a higher risk of flooding, while rising sea levels pose another threat in addition to land subsidence. October 2016. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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‘The other half’: Accelerating the circular economy transition is a response to disruptions in global supply chains and the fulfillment of environmental goals

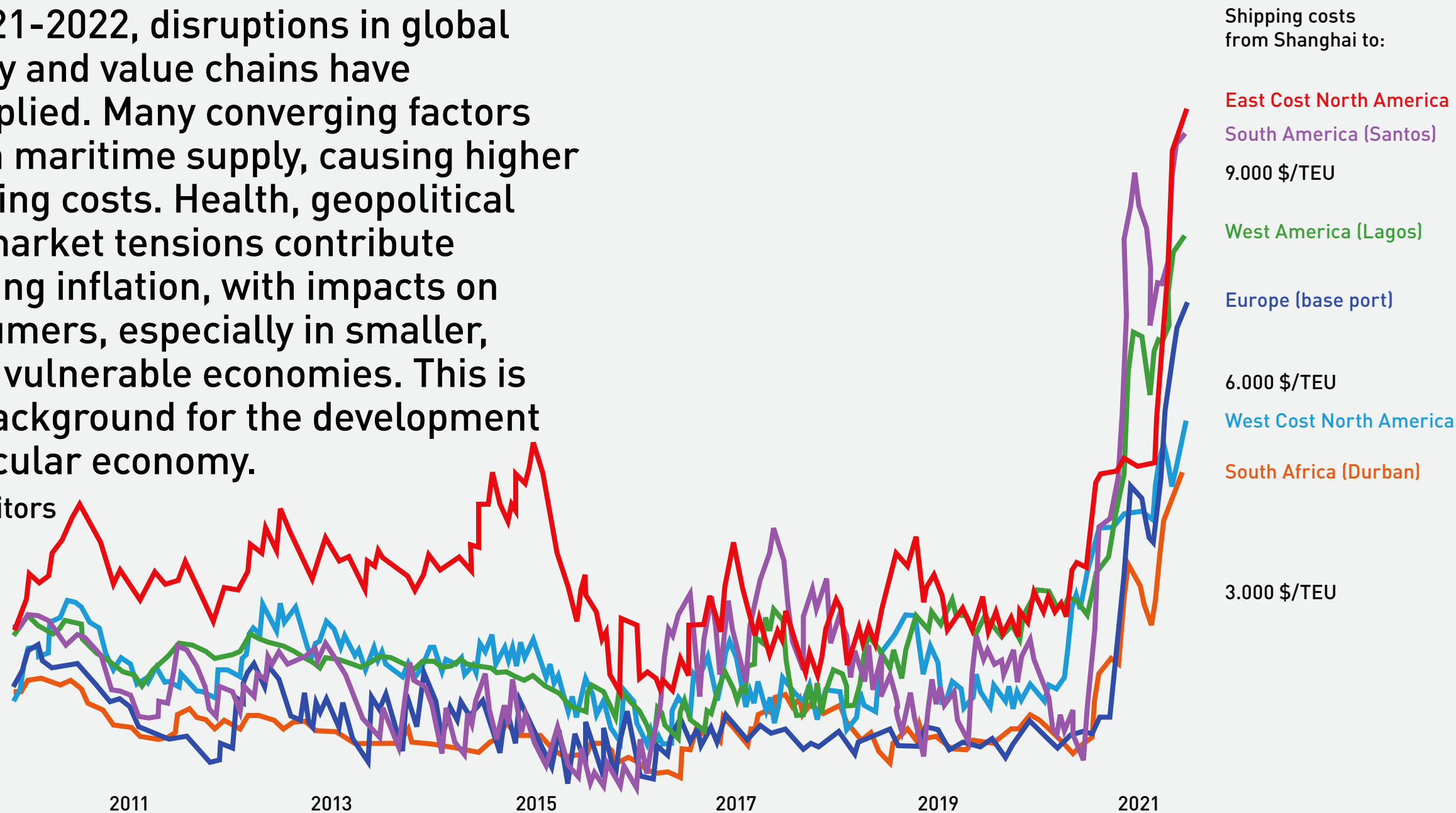
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In 2021-2022, disruptions in global supply and value chains have multiplied. Many converging factors strain maritime supply, causing higher shipping costs. Health, geopolitical and market tensions contribute to rising inflation, with impacts on consumers, especially in smaller, more vulnerable economies. This is the background for the development of circular economy.

-the editors



Evolution of shipping costs during the past decade as per the Shanghai Containerized Freight Index (SCFI) weekly spot rates, 18 December 2009 to 23 July 2021 on selected routes. Source: UNCTAD, based on data provided by Clarksons Research Services, <https://unctad.org/fr/node/34144> (own representation).

preface

Volume 8 of INTERSECTING is devoted to the theme of “Circular Economy and Global Value Chains”. It comes at a time when economic disruptions in global trade are multiplying, as geopolitical tensions are rising and scarcity of basic commodities is driving inflation. This volume is exceptionally rich, with over 30 articles and 50 authors from across the globe. Intersecting perspectives are articulated in three sections: 1) #capital #transitions #people, 2) #development #finance #due diligence and 3) #regions #agenda 2030 #leadership.

The relevance and importance of these issues were also echoed at this year’s Global Solutions Summit (March 29 and 30, 2022). Circular economy was a central issue in many discussions and an impetus for continuous dialogue between the G20 and the G7 communities. Regardless of the socio-economic impacts of the enduring COVID-19 pandemic and the sluggish GDP growth prospects, exacerbated in particular by the war in Ukraine, consumption of resources is growing ceaselessly and waste production is increasing exponentially. It would seem that we are likely to experience the worst, as predicted by the 1972 Club of Rome report ‘The limits to growth’.

We argue that the present times of multiple crises challenge established public and private decision making, putting even more strain on citizens and the galaxy of MSME’s across the globe. This is especially true for those who are aspiring to contribute to, or lead the way towards, new and inclusive business models. Tackling the issue of the global supply

and value chains transformation today means taking a systems-change perspective as many issues require long-term transformations which look beyond immediate challenges. The latest report by the International Panel on Climate Change (IPCC) issued in Spring 2022 reported that the mitigation of climate change can only be achieved with large scale system transformations to limit global warming and tackle CO2 emissions; however, it shied away from making bold statements on the role of value chains to curb resource consumption.

Multilateral environmental diplomacy made a significant breakthrough in February 2022 when the General Assembly of the U.N. Environmental Program gathered in Nairobi. They agreed to prepare a legally binding international treaty on plastics by 2024. This amplifies the findings and proposals curated in the 7th volume of INTERSECTING on Plastics, published in January 2022. We believe the nexus of circular economy, global supply and value chains will attract even more global attention in the coming months and years. Reflecting on the adoption of the Agenda 2030 in 2015, we see that awareness has been rising quickly in many sectors. For instance, rapid transformations are taking place in the fashion and garment industries. There has been an increasing focus on technical solutions to make certain harmful substances and processes superfluous, to replace undesirable ingredients and to also reduce resource consumption. But change has been rather uneven on a regional level while policy frameworks often remain weak and fragile. In particular,

financial models developed in higher-income countries rarely address the issues of informality adequately.

Major players in the industry do not hesitate to talk about 'degenerative linear supply chains' to call for global upscaling of the circular economy. This current INTERSECTING volume showcases the diverse yet complementary inputs needed to transform global supply and value chains effectively. The role of the civil society - from non-governmental activists to consumers - is key. However, the development of ecological and social due diligence as well as the extension of producers' responsibility demand more sustainable investment strategies. More robust regional, national, local, and multilevel frameworks are also needed.

There may never be sufficient cooperation and dialogue to foster capacity building to cope with the magnitude of change that is demanded to reduce CO2 emissions or curb consumption and plundering of raw material. Yet, one main lesson we can draw from this volume is that circular economy is not about managing waste but about managing resources. Chemical processes, energy issues, investing in natural capital as well as land and soil management are part of the wide spectrum of perspectives on bending the linear economy. The circular economy is a regenerative system in which resource use is minimized by closing material loops through durable construction, maintenance, repair, reuse, remanufacturing and/or refurbishing. Thus, given the linearity of most value chains, transitioning into a circular economy is to

be considered constructively disruptive. In the long term, it promises to change the equilibrium established for centuries between actors and world regions by redefining where raw materials are extracted, where they are processed into products, and finally, where they are refined and consumed. In parallel, in the medium to long term, the circular economy will disrupt well-established, organizationally perfected, and legalized linear supply chains.

What once started as an ecological imperative, requiring technological solutions to circularize linear processes, is evolving into a multi-faceted and complex process of reorganizing economic relations, with significant geopolitical, social, and financial implications. Circular production and consumption chains so far account for less than ten per cent of the total global economy, and it is still in its early stages of implementation - the concept is gradually transforming into widespread practice. This present volume of INTERSECTING is an outcome of the Circular Economy Solutions Dialogue series, co-organized by the Global Solutions Initiative (GSI) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). These sessions were held between September 2021 to January 2022. As in previous exchanges since 2020 and the beginning of the editorial project, we have witnessed the extent to which multinational firms and knowledge institutions located in the Global North are still setting up the scene, with suppliers and producers in the Global South servicing consumers globally. But this image is fading and eroding as regional value chains and circular networks

are developing, such as in Africa. Globalization is changing and local economic loops are gaining traction and recognition. In fact, circular economy production processes present a huge opportunity for those eager to innovate and challenge standardized and easily replicable models, which in turn raises new questions about the economic and social inclusion potential of the circular economy. The co-development of public and private regulation as well as the promotion of low-tech should always remain within our scope. It is critical to interconnect circular economy, resources and global trade so as not to lose sight of cross-sectoral priorities, be it human rights, environmental protection, or welfare and job creation. What would be the point of celebrating carbon neutral, recycled, and sophisticated objects only made available to a happy few?

Ultimately, changing consumer and cultural mindsets around (over)consumption is another priority as we need to account for the contributions of our natural capital to our economic ecosystem and society. We aim at not only shining light to the opportunities of revising the organization of global value chains but to also bring related issues and corresponding debates to the fore. Hence, we trust that the present volume will help decision makers, in particular leaders in the G20, understand that prioritizing resources efficiency should infuse the development of regional, cross-border and global trade.



capital

Image Source: In the outskirts of Shanghai on a sunny autumn day during the time of the World Expo 'Better Cities, Better Life' (2010), years before the pandemic outbreak and the severe lockdown of spring 2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.

BENDING THE LINEAR ECONOMY

ON VALUE CHAINS

capital transitions people

1.1. Making circular economy work in a globalized world

Fabian APONTE, Moana SIMAS, and Kirsten WIEBE
SINTEF, Norway

1.2. Beyond global value chain: Towards a model of intersecting circular and creative economy

Milindo CHAKRABARTI, Jindal Global University, India

1.3. Stakeholder platforms as tools for a transition to circular economy in global value chains

Jan Vincent JORDAN, Institut für Textiltechnik of RWTH Aachen University (ITA), Germany
Magnus BENGTSSON, Hot or Cold Institute, Japan
Cristian MATTI, EIT Climate-KIC, Belgium

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Vesna LAVTIZAR, Kitakyushu Urban Centre, Institute for Global Environmental Strategies, Japan
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Sherien ELAGROUDY, Ain Shams University, Egypt

capital
transitions
people

“The EU Circular Economy Action Plan stresses the need for international collaboration, pointing to the integration of circular and sustainable standards in trade agreements, and the necessity for political cooperation. However, it is not clear how the trade-offs from circular measures will be mitigated and what the global magnitude of these effects would be.”

-Fabian APONTE, Moana SIMAS, Kirsten WIEBE

Image Source: Virginijus Sinkevičius, E.U Commissioner for Environment (middle), Thierry Breton, E.U Commissioner for Internal Market (right) and Frans Timmermans, Executive Vice President of the E.U. Commission (left), at a joint press conference on the E.U Green deal and the implementation of the EU Circular Economy Action Plan (CEAP, 2020) regarding sustainable products and consumers protection. E.U. Commission, Brussels. March 30, 2022. Photo Credit: <https://twitter.com/ThierryBreton/status/1509140023295320071>

BENDING THE LINEAR ECONOMY

ON VALUE CHAINS



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has become increasingly globalized. Our societies are linked through mobility of production inputs, such as capital, labor, and technologies, and through supply chains with multiple production stages distributed across the globe (i.e. global value chains). Therefore, local and regional strategies that affect production, distribution, and use of products (such as CE policies) have impacts in different parts of the world through the changes they create in global value chains.

Circular economy measures should be seen as part of a just transition: the transition to a more sustainable development, in which three main pillars, economic, social, and environmental, should be equally safeguarded.² Thus, to understand the implications of circular economy measures, analyzing the effects of policies and strategies should not be limited to local and national levels, but also consider cross-country spillovers that occur through global value chains on the social, economic, and environmental dimensions. Much focus has been given to, for example, consumption-based carbon emissions from imported products, but CE strategies affect jobs, livelihoods, material demand, and many other dimensions as well.³ Those impacts are not always well understood or considered in CE policies.

As part of the European Green Deal, the EU Circular Economy Action Plan (CEAP)⁴ seeks to promote circular economy processes in the European industry, incentivize responsible consumption, and extend the use of materials and resources in the economy. The CEAP focuses on six

Making circular economy work in a globalized world

Circular economy (CE) strategies have gained momentum in the policy making agenda in recent years to reach the Sustainable Development Goals (SDG) and to fight climate change.¹ Throughout the last decades, the world economy

value chains with great potential for circularity: electronics and ICT; batteries and vehicles; packaging; plastics; textiles; construction and buildings. Strategies in the CEAP include the need to extend the useful life of products, better recycling processes, minimization of waste residuals, reduction of greenhouse emissions, and reduction in the demand of virgin materials. These strategies can bring positive effects at the EU level, such as increasing resilience of material supply for strategic industries. Additionally, the increase in labor-intensive activities such as recycling and research and development, which are directly addressed in the plan, result in higher GDP and job creation.

The priority industries in the CEAP are embedded in global supply chains so actions taken to transform them will inevitably have consequences in other parts of the world. For instance, in the textiles sector, 60% of textile value consumed in the EU is produced elsewhere.⁵ Circular economy measures, such as extending lifetime of textiles and/or increasing reuse, will create trade-offs in global value chains. While this transformation is necessary due to the high and increasing volume of resources and waste associated with fast fashion, reducing the demand for textiles will ultimately affect workers, often vulnerable, from low-income countries. Globally, it is estimated that the textile industry employs 300 million people, most of them women.⁶ Thus, while CE strategies may create positive impacts such as the reduction of emissions and waste from textiles, negative effects may occur along the value chain. Lower

economic activity in production countries (e.g. Bangladesh and Viet Nam) may be accompanied by higher unemployment in women which, in turn, widens the poverty and gender gaps in the developing world.

The CEAP stresses the need for international collaboration, pointing to the integration of circular and sustainable standards in trade agreements, and the necessity for political cooperation. However, it is not clear how the trade-offs from circular measures will be mitigated and what the global magnitude of these effects would be. Measuring the effects of CE strategies in global value chains is essential to guarantee that positive environmental outcomes in the Western developed countries contribute to a just transition in developing countries, and not be built on increased inequalities and lower standards for low-income countries. In Norway, the national plan for a green circular economy⁷ closely follows the same guidelines as the CEAP, although there is an increased focus on reducing waste from consumer goods and extending the lifetime of products. The Norwegian economy is unique as most of their manufactured consumer goods are imported. In addition, due to high income and cultural preferences of Norwegian households, consumption of products in Norway is 25% higher than the European average,⁸ providing big opportunities for the country to adopt CE measures focused on consumers.

It has been estimated that circular economy measures in some of the priority industries can bring positive effects in

employment and value-added creation in Norway.⁹ This potential comes from a more intense and longer use of goods, which increases the need for more workers for the maintenance, repair, and recycling of consumer goods such as electronics and textiles. Also, there could be significant reductions in greenhouse gases emissions because of circular practices in the buildings and construction sector. The study also found that circular economy measures significantly decrease the imports of manufactured goods, basic metals, and raw materials as those imports can be replaced by recovered secondary materials as well as sharing and repairing of consumer goods. Consequently, the reduction in imports can bring negative socio-economic consequences in the industries and countries along the global value chains. While a reduction in environmental pressures is generally positive, it is important to identify in which countries potential job losses may occur, so that policies can be put in place to minimize negative socioeconomic impacts in affected countries.

To reach an inclusive and just transition, circular economy strategies need to be contextualized in the global market. Quantitative assessments of the effects of circular economy policies along value chains are central to guarantee that the route towards improvement of environment-related SDGs in some countries do not lead to the deterioration of socioeconomy-related SDGs in other countries. Potential benefits and trade-offs should be identified to provide input for new policies and international collaboration so as to

mitigate the risks and better distribute the gains from sustainable processes worldwide.

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“A typical smile curve indicates that the greatest value is captured by upstream and downstream firms, located mostly in the developed countries. Concerns about tendencies of inequities have to be carefully integrated within circular economy and global value chain proposals.”

-Milindo CHAKRABARTI

Image Source: Wikimedia Commons. July 10, 2013. Photo from the Fourth Global Review of Aid for Trade, 8-10 July 2013. Photo Credit: © WTO/Studio Casagrande. [https://commons.wikimedia.org/wiki/File:Fourth_Global_Review_of_Aid_for_Trade_“Connecting_to_value_chains”_8-10_July_2013_\(9253014843\).jpg](https://commons.wikimedia.org/wiki/File:Fourth_Global_Review_of_Aid_for_Trade_“Connecting_to_value_chains”_8-10_July_2013_(9253014843).jpg)



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Beyond global value chain: Towards a model of intersecting circular and creative economy

Humanity is facing a double-edged sword. On the one hand, primary resources – most of them non-renewable – provided by nature is getting depleted at a rapid rate, causing concerns about their availability in the coming days. Studies show that global material extraction has grown to more than three times of what it was four decades ago (Schaffartzik et al., 2014), and shows little sign of slowing down (Wiedmann et al., 2015). It is further observed that the world generates 2.01 billion tones of municipal solid waste annually, with at least 33 percent of that not managed in an environmentally safe manner (Kaza et al. 2018). On the other hand, aspiration for an increasing quality of life over time is in a quest for opportunities to produce and consume goods and services in larger quantities, if not of better quality, simultaneously.

Call for moving away from the traditional idea of take-make-use-dispose and engaging in circular economic production

practices is a step in the right direction as it would not only entail reduction in use of material resources, but also help reduce waste generated. The centrality of global value chain in the present global architecture of manufacturing, on the other hand, has opened opportunities to increased productivity by making use of efficiency that can be achieved through international division of labor. A meaningful complementarity that might be generated by superimposing these two ideas apparently can blunt both the edges of the sword hanging over the existential guarantee of human beings. The circular economy model would help reduce the use of material resources, recycle a large a part of it and also arrest the associated risk of waste generation. The reduction in resource use would be complemented by more efficient use of resources through the application of global value chains.

The seemingly win-win solution, however, is fraught with concerns. While the circular economy solutions identified are mostly technocratic in character, available evidences are not robust enough to adequately address the creation and dissipation of systemic and multidimensional value that spans the social, environmental and economic domains (Iacovidou et al., 2017). Simultaneously, global value chains are also alleged to contribute to growing inequality across the globe (Lopez et al. 2015). Investments to upgrade the skillsets of the low-skilled labor by promoting further tertiary education is a necessary condition to arrest the iniquitous tendencies of the global value chain. Moreover, at a country level, “Gains from GVC participation are not automatic. Benefits of GVCs

can also vary considerably depending on whether a country operates at the high or at the low end of the value chain” (OECD, WTO and World Bank Group (2014). Baldwin et al. (2014) observes a paradoxical pair of concerns between developed and developing countries, as have been shown by the idea of the smile curve conceptualized by Shih (1996). Stripped of its methodological details, a smile curve in global value chain identifies a propensity of relatively lower share of the global value created in developing countries that participate in the production network, compared to their developed country partners. A typical smile curve indicates that the greatest value is captured by upstream and downstream firms (located mostly in the developed countries), and the lowest value is captured in the middle of the value chain (located in developing countries) (Shin, et al. 2012).

The proposal to create a synergy between ideas of circular economy and global value chain has to be carefully integrated with concerns raised about the associated tendency of inequities. Investments – both physical and social – required to pursue a circular economy environment in the effective sense of the term may not be affordable to many developing countries with their own resources. Interest bearing assistance to meet the resource shortfall may lead to a threat of unsustainable state of indebtedness. A possible clue may be taken from the simultaneous efforts at developing creative economy that is evolving at a considerable pace. A creative economy lies at the interface between human creativity, ideas, culture, knowledge and technology. An UNCTAD

document records that the sector was one of the fastest growing in every region of the world (UNCTAD 2018). Being not enslaved to the quest for increasing returns to scale, the knowledge and culture intensive creative economic efforts will open up a competitive space for micro-small and medium scale enterprises to participate in the globalized mode of value creation, piggybacking on the emerging digital infrastructure that has the potential to considerably reduce the costs of transactions in a scale-free manner. It will also be easier to integrate the norms of circular economy in a more effective manner with a creative economy architecture without much of social, cultural and economic costs and pave the way for non-linearization of the existing system of manufacturing. We are all keen to achieve the Agenda 2030 that specifies the goal of “leaving no one behind”. Integration of circular and creative economy can take us to the goal faster.

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“The Global Alliance on Circular Economy and Resource Efficiency was initiated in 2021 by the European Commission and UNEP. Bringing about fundamental changes in different sectors associated with a circular economy are being promoted under the emerging concept of Transformative Innovation Policy.”

- Jan Vincent JORDAN, Magnus BENGSSON, Cristian MATTI

Image Source: Selling spare parts for the construction industry in a street of Makati, Manila Metro area, in the Philippines. The transformation towards circular economy is not just about global supply and value chains but about managing transformations that apply to different economic development cycles. Image by Nicolas J.A. Buchoud, all rights reserved ©.

BENDING THE LINEAR ECONOMY

ON VALUE CHAINS



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Stakeholder platforms as tools for a transition to circular economy in global value chains

How much time is left for sustainable innovation initiatives to be efficiently implemented? Not enough to reinvent the wheel. We need to improve the sharing of experiences and

lessons learned. As stated in the CGRI's Circularity Gap Report 2021, the fulfillment of climate pledges is closely linked with improved circularity. In order to succeed, it will be necessary to “almost double circularity to close the Emissions Gap by 2032”.¹

Reflecting on the relevance of circularity for slowing climate change and achieving the SDGs, the Global Alliance on Circular Economy and Resource Efficiency (GACERE) was initiated in 2021 by the European Commission (EC) and UNEP, in coordination with UNIDO and with the Ellen McArthur Foundation, the Platform for Accelerating the Circular Economy (PACE – covering Latin America & the Caribbean as well as Africa); the World Circular Economy Forum (WCEF, hosted by Canada) and the Finnish Innovation Fund (Sitra) are strategic partners.² Hence, on the level of policy advisory and policy making, a global exchange of information, knowledge and best practices seems to be achievable. Nevertheless, engagement, capacity and skills building as well as awareness raising among other stakeholder groups, such as consumers and the industries, are still a massive challenge.

Regarding cross-regional and cross-value chain transformation, discussions on how to bring about fundamental changes in different sectors associated with a circular economy are being promoted under the emerging concept of “Transformative Innovation Policy”.³ A building block of this burgeoning policy paradigm rests on the understanding that a portfolio of policy interventions is required to initiate

and advance transformations and that a mix of supply-push and demand-pull instruments are required to address all stages of the innovation cycle. To that end, the EIT KIC and its partners carried out a system and policy mapping exercise in the Western Balkans as part of a co-creation process to get a clear picture of what the current ecosystem looks like (i.e. where, how and who is involved in specific value chains) so as to enable regional innovation portfolio discussions.⁴

To address existing challenges, the European Circular Economy Stakeholder Platform (ECESP) was established in 2017. It provides an overview of best practices, position papers and potential partners in Europe. However, there is a rapidly growing body of experiences and lessons from other world regions, as the 120 projects in the database of the SWITCH-Asia SCP Facility⁵ highlight. Hence, mechanisms to facilitate knowledge sharing at the regional level would be of great value. Responding to this need, Latin America and the Caribbean launched a Circular Economy Coalition in 2021;⁶ in Africa, there is both a Circular Economy Network and a broader Circular Economy Alliance. ASEAN's Circular Economy Stakeholder Platform is currently being established.

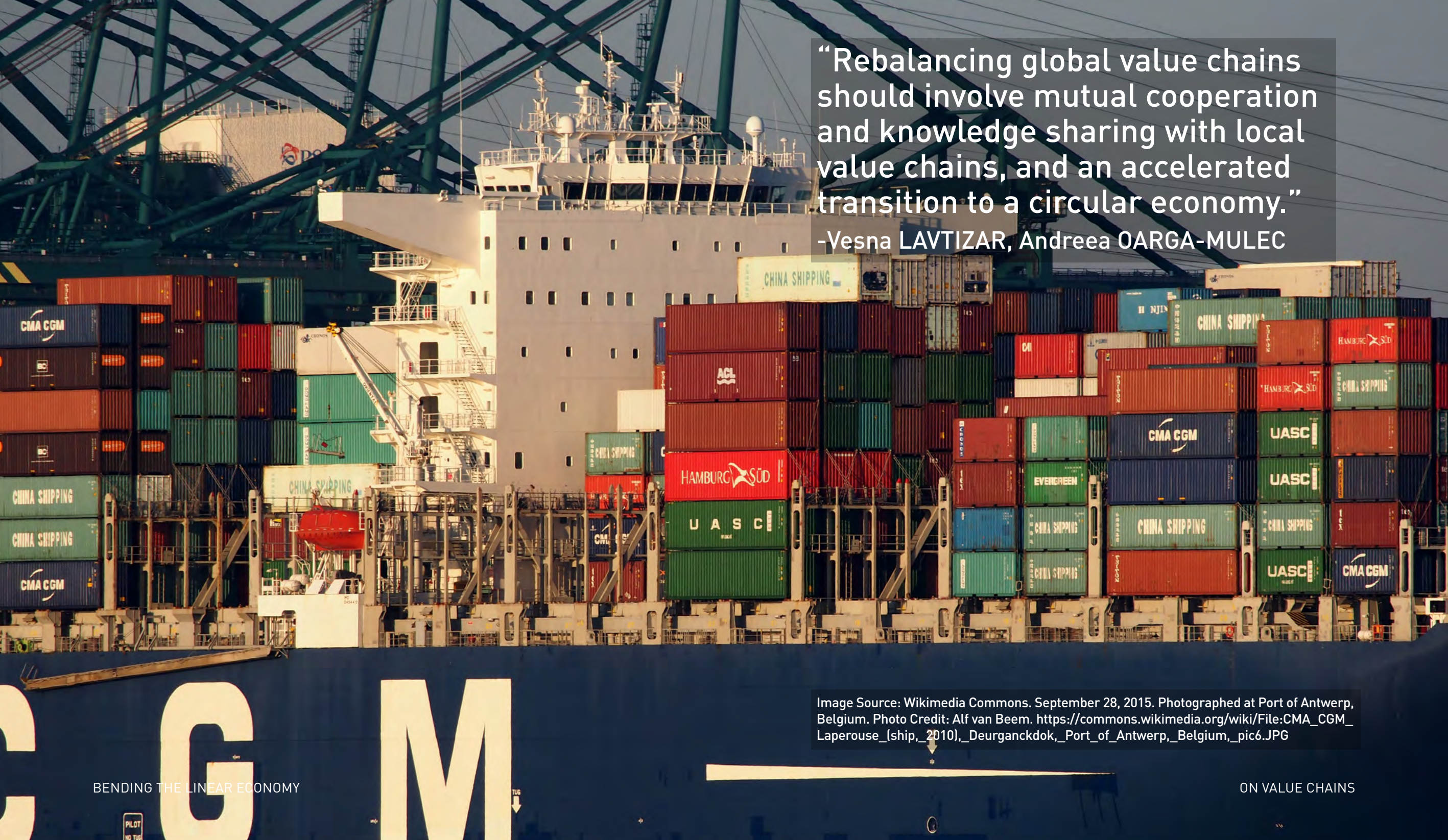
A concrete example of good practices is the emerging initiative on systems and stakeholders mapping for policy engagement. This initiative has contributed significantly by introducing innovation portfolios as a framework to support development policies. It also positions existing circular economy challenge owners in a systems viewpoint as part of the

co-creation process. Innovation portfolio management can provide a framework to transform preliminary ideas and prototypes into real investment opportunities by revealing potential synergies within the current targeted system⁷ (OPSI OECD, 2021).

Knowledge sharing and exchange of best practices by providing dedicated connections between the existing alliances, initiatives and stakeholder platforms and networks world-wide is highly encouraged.

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“Rebalancing global value chains should involve mutual cooperation and knowledge sharing with local value chains, and an accelerated transition to a circular economy.”

-Vesna LAVTIZAR, Andreea OARGA-MULEC

Image Source: Wikimedia Commons. September 28, 2015. Photographed at Port of Antwerp, Belgium. Photo Credit: Alf van Beem. [https://commons.wikimedia.org/wiki/File:CMA_CGM_Laperouse_\(ship,_2010\),_Deurganckdok,_Port_of_Antwerp,_Belgium,_pic6.JPG](https://commons.wikimedia.org/wiki/File:CMA_CGM_Laperouse_(ship,_2010),_Deurganckdok,_Port_of_Antwerp,_Belgium,_pic6.JPG)



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Establishing a new balance: A fair marriage between global and local value chains

The COVID-19 pandemic was the most recent global wake-up call that challenged the resilience of various systems and disruptions along supply and value chains. Car producers, for example, experienced significant profit declines when the pandemic disrupted the procurement of semi-conductors and other auto parts.¹ Instances such as this exemplify the dilemma facing companies and policymakers about whether the benefits associated with maintaining globally distributed value chains outweighs the threats of force majeure that could disrupt supply, production, and

marketing chains. Geopolitical instabilities as well as the increased likelihood of natural disasters in some of the partner countries are other credible concerns that are leading some players to shift from globalization to localization of their overall business activities. This paradigm shift has been greatly aided by the concept of sustainability, which rightly questions whether a product (including a Design for Environment or DfE product) produced and sold through a cascade of several distant partner countries can be considered sustainable. As a result, some also see this period as a unique opportunity to go green, with shortening supply and value chains being an important strategy under the philosophy of “building back better.”

Long, linear supply chains have their own risks and can be fragile, which is why some argue that global value chains need to be rebalanced, and risk mitigation strategies be put in place. Key recognizable global supply chain vulnerabilities include insufficient manufacturing capacity, limited international coordination, inconsistencies in industrial policies among allies and partners, and geographic concentration in global sourcing. For example, certain key supply chains have become geographically concentrated due to the search for low-cost production, as in the case of China, which accounts for over 70% of global lithium-ion battery production capacity,² or Taiwan’s 92% of state-of-the-art semiconductor production.³

Global value chains can improve their efficiency by linking with local and regional value chains and the circular economy. The environment, economy, society, and businesses can benefit greatly from local and circular value chains - from reduced emissions, sustainable growth and new jobs, to security of supply resilience, proper waste management, and legal compliance.

Recycling and local use of renewable energy, for example, can reduce our dependence on imports of virgin materials and fossil fuels from distant countries.⁴ To shorten supply and value chains, new local connections must be created where possible. One example is industrial symbiosis, where linkages between partners are often created in smaller geographic areas where they can accelerate circular transitions.⁵

As increasing globalization may bring additional adaptation pressures on local levels, it must be recognized that the globalization process is complex in nature and should take place in connection with local or regional places, avoiding demeaning attributions such as 'weak' or 'small' for regional, and 'strong' for global.⁶ Regardless of whether value chains are global or local, they must be imbued with circular economy principles. Global value chains that exemplify the principles of circular economy can be an immense asset in promoting circularity, putting it on the global agenda, and accelerating the closure of global and local circularity gaps.

Rebalancing global value chains should therefore involve mutual cooperation and knowledge sharing with local value chains, and an accelerated transition to a circular economy. For this, vulnerabilities that could disrupt global value chains' continuity, such as business fragmentation, geographic separation, lack of technological resilience, and relationship exploitation, need to be identified and mitigated.⁷ Learning from nature, where biodiversity plays an important role in the resilience of the biosphere and of ecosystem services, we should consider applying diversity conservation to the Anthropocene biosphere (the biosphere shaped by human activities). This would imply considering the fragmentation and length of value chains, whether they provide any (e-)learning and innovation opportunities, their geographical operation area, their contribution to local economic growth and respect for local culture, as well as their environmental impacts. Relationships and behaviors may ultimately be the most important factor in determining the resilience of value chains.

Past and recent (natural, economic, political) crises have taught us valuable lessons, including the importance of resilience, the need to invest in innovation, rethink our production, monitor potential supply chain disruptions and, above all, to value markets that support sustainability. All that remains is to act at all levels, in a global effort.

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“An unintended benefit from the disruption of global supply chains by the COVID-19 pandemic is the compulsion to discover economies through the ‘scope’ of diversity within systems, rather than economies from ‘scale’.”

-Arun MAIRA

Image Source: A typical urban retail street scene in Ben Thanh district in central Ho Chi Minh City, Vietnam (2019). Image by Nicolas J.A. Buchoud, all rights reserved ©.



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Designing in circles: Global supply chains to locally circular economies

Expansion of global supply chains has been a principal driver of globalization. Production, marketing and financial systems have spread across nations' boundaries. The concept of "circular economies" is becoming attractive to manage ravages of unsustainable exploitation of the Earth's resources. Globalization has increased economic outputs as well as the concentration of wealth. Increasing inequality in incomes and wealth within and between countries is alarming. Wealth is being sucked up faster to the top of economies while the trickle down to the masses is slow. Circulation of wealth through the economy has reduced. Therefore, concepts of faster circulation within systems must be applied not only to materials and energy, but to wealth creation too.

"The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking,"

said Albert Einstein. Changing the design of economies from the paradigm of linear supply chains to a paradigm of circular systems requires changes in ways of thinking about designs of enterprises and economies.

Optimizing sub-systems in isolation of each other reduces sustainability of the entire system

Global supply chains are linear chains of raw materials, moving from producers to consumers. The growth of global transportation systems, along with lowering of international trade barriers, has enabled local producers of organic food to sell their produce to 'woke' consumers on other continents. However, the benefits of natural production are offset by large amounts of carbon emissions in the transportation of food. Moreover, with the expansion of its market, the local enterprise must scale up. It must use more land for the product in demand by clearing out other flora and fauna. Consequently, the environmental health of the local system deteriorates.

Scaling up produces economies of scale but reduces sustainability, which requires economies derived from the "scope" of systems. The latter requires diverse processes of production and consumption to interact with each other, so as to sustain each other. An unintended benefit from rising trade barriers due to the geo-political tensions, as well as the disruptions of global supply chains caused by the COVID-19 pandemic, is the compulsion to discover econo-

mies through the scope of diversity within systems, rather than economies from scale.

Locally circular supply chains are necessary for environmental sustainability. For systems' sustainability, the circle of production and consumption must be close and tight so that consumers become sensitive to the impact of their decisions on the condition of the wider system within which they are embedded.

Financial wealth extracted from social and environmental systems must now return faster to sustain them

There are similarities in the structures of the circular material economy and the circular financial economy. In the circular material economy, solid waste is generated from the production-consumption system, and it accumulates elsewhere, choking up landfills, rivers, and oceans. In the circular financial economy, financial capital is generated outside of the production system and accumulates within the financial sector. The financial sector has grown greatly within the global economy in the past three decades. Financial resources from banking are being invested in financial funds (e.g. hedge funds, derivatives, etc.) There, they create more financial wealth for investors; they do not immediately return into the production sector. Thus, the economic system is choked up by the accumulation of a virtual resource, i.e., money, in the financial sector, just as the environmental system is choked with plastic and other solid waste.

Business corporations are searching for profits at the bottom of the pyramid. They create innovative products and services affordable for people with low incomes, thereby expanding their markets. The profits flow to investors, wherever they may be in the world, and not the producers on the ground. Investors accumulate wealth from profits at the bottom of the pyramid, not the people.

The issue is: Who owns the enterprise? The people at the bottom, or only a few at the top? Until people become owners of their own enterprises, they cannot make profits from them nor accumulate wealth. Those who have wealth will make more wealth by investing their wealth in more enterprises for profits. Those with little wealth, or none, are left further behind. Therefore, more enterprises run and owned by the people are required to reduce wealth disparities. This was Mahatma Gandhi's model of locally circular economies. His spinning wheel was a symbol of the circular economy.

Local systems solutions are essential for solving systemic global problems

Slow growth of incomes at the bottom of the pyramid has begun to alarm politicians and economists. Investors are also concerned. If people do not earn adequate incomes who will buy the products and services from their capital-intensive, automated, enterprises? Implementing a "universal basic income" is an idea fancied by some

economists, who want to douse the fires though it will not address the root cause of the problem. People continue to have inadequate opportunities to earn a good income. Wealth at the bottom of the pyramid must be increased with more enterprises owned and run by the people - people who work and create value. With more wealth, they will have more freedom.

The material economy must become locally circular for environmental sustainability. The money economy must become more locally circular too for reducing economic disparities. The two economies are intertwined. The world needs local systems solutions to solve global economic and environmental problems.

Mahatma Gandhi had a message for wealthy capitalists. During our brief time on Earth, we think the wealth we acquire has become our property to do as we wish with it. However, we are only trustees of whatever wealth the system provides us. He had no issue with entrepreneurs operating their businesses more efficiently to produce more wealth. In fact, they should so that nothing is wasted. However, whatever wealth is produced must be invested back to improve the system from which it was obtained, and not wasted on extravagant consumption. Wealth must be used in service of society - from society it has come; to society it must return.



“Leasing is already an established practice for traders and refining companies in the precious metals sectors. In an advanced circular economy, a range of mined minerals and/or manufactured metals could be leased to companies by producer countries, with the country of origin retaining ownership.”

- Jack BARRIE, Patrick SCHRÖDER, Tim BENTON

Image Source: Wikimedia Commons. April 13, 2017. Leaving her family for a 10/4 work/rest days far from home in a small town at 200 km from Abidjan, an Ivorian woman in a mining company should be celebrated for her courage and sacrifice to help her family. Miss Ekepe Lydie is an operator at the process plant. Every day, she is in charge of the grade control and the cyanide concentration. Being in contact with chemicals could be dangerous but she knows very well how to respect the safety rules. Photo Credit: Aamlorievi. https://commons.wikimedia.org/wiki/File:Ivorian_Women_in_Mining_Industry%CB%90_the_busy_and_strong_process_operator.jpg



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Achieving a just net zero transition via a circular economy

Achieving a global net zero transition will require the deployment of a range of materially intensive technologies and infrastructure. Many of these, such as electricity grids, solar panels, wind turbines, battery storage systems and

electric vehicles, require a wider range of material inputs in comparison to more conventional energy production methods. These range from iron, steel and copper through to lithium, cobalt, gold and rare earth metals.¹ According to the International Energy Agency, to achieve net zero globally by 2050, demand for mineral inputs will increase on average by 600% by 2040 with demand for some (such as cobalt and lithium) increasing by more than 2,000-4,000%, if the linear economy production and consumption approach to energy continues.²

Circular material mining practices to meet this surge in demand is predicted to result in significant environmental and social impacts. In terms of environmental impact, minerals such as gold, iron ore and copper are commonly mined within or near forests and other critical ecosystems that play an important role in regulating climate and are home to globally significant biodiversity.³ Mining activities have been demonstrated to cause significant environmental harm to these ecosystems. As such, rapid scaling up of mining for minerals to produce renewable energy technologies, if done unsustainably, would likely have an adverse impact on climate and biodiversity goals. Mining for minerals such as cobalt and nickel, which are essential for electric vehicles, also has high social risks. Since 2010, 304 human rights abuse allegations against 115 different mining companies have been recorded globally. No doubt, many more cases go unreported.⁴

An increase in mining of minerals is essential to supply sufficient materials at the pace and scale necessary to meet the global net zero target. Yet, the associated environmental and social impacts of extraction, processing, consumption, and waste disposal do not typically feature in net zero strategies.

There is significant potential to achieve net zero in a less material-intensive and environmentally harmful ways by applying circular economy principles to achieve energy and material demand reduction.

Achieving circular net zero transition

A circular economy aims to decouple economic activity from environmental impact through designing out waste and pollution. Circular design encompasses everything, from the micro-level of material choices and product design, as well as redesigning business models and value chains, all the way to the systems level. This systems approach allows for slowing, narrowing, and looping of material flows and the regeneration of natural ecosystems. The overall objective is to enable decoupling, where circularity directly reduces the demand for virgin materials needed to achieve net zero.

Examples of circular solutions for net zero include designing renewable technologies to be more durable and more

easily repaired, remanufactured, and recycled to recapture critical valuable materials and circle them back into the economy. This reduces the demand for virgin materials. For example, wind turbines can be fitted with real time monitoring of components to ensure they are maintained and repaired timely, to maximize their lifetime. Furthermore, 85-90% of the total mass of a wind turbine can already be recycled into new wind turbines.⁵

Circular solutions are particularly valuable in changing consumption patterns in energy intensive sectors and areas of the economy where limited energy efficiency improvements can be made. The built environment is one such area. Designing neighborhoods to be much denser significantly reduces the material and energy footprint. Buildings that are multi-functional, energy efficient and easy to deconstruct – and therefore easy for materials to be reused – means that the energy demand throughout the entire lifecycle of buildings can be dramatically reduced.

Mobility is a second area in which circular solutions can dramatically reduce energy and material demand. Examples of circular mobility solutions include shifting to a sharing economy model where mobility is offered as service through rental models or through active travel, such as cycling. Both are more materially and energy efficient. The reuse and refurbishment of electric vehicle batteries as energy storage devices in homes, offices, and factories, thereby displacing new batteries, is another example.

A recent study conducted by the Centre for Research into Energy Demand Solutions (CREDS) suggests that if the UK implemented widespread energy demand reduction measures, it could more than halve its energy demand by 2050.³

Simultaneously, as we begin to reduce our consumption of energy and products through circularity, we need to continue to mitigate the adverse economic and social impacts our - unavoidable - extraction of minerals will have on low-and-middle income CRM producing countries.

The concept and political agenda of a 'just transition' has gained significant traction in national and international debates on climate change and energy transitions, but this needs to be extended to the circular economy.⁶

To that end, new approaches to ensuring equitable material ownership needs to be explored. For example, new models of leasing mineral and materials could be explored. Leasing is already an established practice for traders and refining companies in the precious metals (e.g. gold, silver, platinum group) sectors. In an advanced circular economy, one at a level required for achieving net zero, a range of mined minerals and/or manufactured metals could be leased, rather than sold, to companies by producer countries, with the country of origin retaining ownership. The idea is that the resource, in whichever form, is leased for a certain period of time and then 'returned'. It would also provide high

incentives for recycling and improving designs of high-tech equipment, electronics, and batteries to ensure easier recovery of CRMs.

Realizing the goal of net zero should not come at the expense of creating other environmental and social impacts. Embedding the circular economy within net zero strategies is critical to reducing our overall demand for energy and materials. We need to keep our eyes on the overarching goal: ensuring our consumption of natural resources fits within all the planetary boundaries and not just climate.

Case Study: Anglo American's Future Smart Mining™
<https://www.angloamerican.com/futuresmart/futuresmart-mining>

Key highlights:
Intelligent Mine: integrating IoT sensors, UAV drones and other SMART connectivity devices into mining operations to capture big data for predictive analytics and AI that drives self-learning operations.

Concentrated Mining: improving mining efficiency by reducing the ratio of metal to ore and minimizing environmental footprints as well as energy consumption, operating, and capital costs.

Water-less Mine: on-site closed loop water recycling and drier tailings

Modern Mine: robotic drilling equipment to reduce blast mining while increasing the recovery of low-grade ores and complex minerology.

Sustainable Mining Plan: planning for and catalyzing sustainable development in host communities to ensure economic viability far beyond the life of the mine.

These principles have already been embraced by the African Circular Economy Alliance with the goal of improving mining practices while integrating artisanal and small-scale mining operations.

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“Natural capital, the world’s stock of natural assets, provides a stream of benefits to humans. For a sustainable global value chain, we need to account for the contributions of our natural capital to our economic ecosystem and society.”

-Sherien ELAGROUDY

Image Source: Green hedges in rural agricultural areas contribute to biodiversity and water resources preservation, a key asset in times of mounting drought episodes. Although they bring significant environmental services, they are too often in competition with intensive agricultural practices. Replanting them when they have disappeared gives an idea of the magnitude of the hidden value of natural capital. On the photography, replantation of green hedges in Normandy (Orne District, community of Le pays ferlois et le bocage carrougien), an investment of circa €10K /km (or €100K for 10 km), and the result of long preliminary land management negotiations. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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A perspective on accounting for natural capital in the global value

Every part of the total global value chain depends on natural capital such as forests, rivers, minerals, oceans, air, and land. Humanity is now witnessing its dominant impact on the operation of the biosphere and its natural capital. It is essential to account for natural capital within the global value chain to transform actions, technologies, and developments towards a circular economy.

Up until the industrialization era, humans did not account for their impact on the ecosystem. Today, we are experiencing the undeniable impacts of climate change and biodiversity loss; we have realized that human activities are damaging the biosphere. For example, over the last century, water engineering and irrigation systems that control river discharge to oceans have modified the hydrological behavior of water resources and have caused irreversible losses (UN-Water 2009). Moreover, the global population

has already consumed approximately 50% of all renewable freshwater sources, which has led to considerable ecological disturbances such as the vanishing of 50% of the biosphere's wetlands (Gleick and Palaniappan 2010).

Ecological economists have introduced the concept of natural capital with a focus on 1) evaluating the magnitude of human activities and ensuring that they are ecologically sustainable, and 2) efficient and fair distribution of resources between the current and future generation ("Investing in Natural Capital" 2013). Natural capital comprises non-renewable resources such as oil, coal and minerals. Renewable resources include ecosystem services which make human life possible, ranging from the air we breathe, to the water we drink, the food we eat, and even the inspirations we gain from the beauty of nature and wildlife.

In short, natural capital can be described as the world's stock of natural assets that provides a stream of benefits to humans and their economic ecosystem. Degradation of this natural capital therefore poses risks for the economic system, including for the financial institutions that invest in these businesses.

The last decade has seen increasing investments in natural capital to preserve natural ecosystems. Efforts have also been made to quantify natural capital to make it perceptible within the economic system. Altogether, this has spurred further investments. For example, natural capital

accounts for 30-50% of the total wealth of African countries but it is being depleted in several of these countries, negatively affecting their economies and making livelihood improvements of the underprivileged only slightly noticeable (Lange, Wodon and Carey 2017). Some countries like Uganda and Rwanda have adopted the World Bank-led Wealth Accounting and the Valuation of Ecosystem Services (WAVES) program (“About Us | Wealth Accounting” 2016), which aims to measure the contribution of natural capital and ensure that natural resources are represented in national economic accounts, thereby providing these countries with a better understanding of the trade-offs of their investment choices (Lange, Wodon, and Carey 2017).

After implementing WAVES, Rwanda has witnessed improvements in its land accounts. Policymakers were able to study trends in land use and changes over time, thus leading to better land management nationally (“Natural Capital Accounting | Wealth Accounting” 2018). In 2019, Egypt joined the WAVES program and is working towards developing air emission, waste, and coastal ecosystems accounts (“Natural Capital Accounting | Wealth Accounting” 2018).

For the global value chain to function sustainably, we need to consider accounting for our natural capital and its important services to business, economy, and society.

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development

Image Source: A cargo ship in the port of Vladivostok and the first winter snow, a few months before the 2012 APEC summit, which was held on nearby Russky Island. Extensive infrastructure measures were carried out in the run-up to the summit, but these had only a limited impact on local development. Image by Nicolas J.A. Buchoud, all rights reserved ©.

development finance due diligence

2.1. Sustainable and inclusive global value chains as an opportunity for developed and developing countries
Victor STOLZENBURG, World Trade Organization (WTO), Switzerland

Daria TAGLIONI and Deborah WINKLER, The World Bank, United States of America

2.2. How do regulations for due diligence and circularity match up?

Katja KRIEGE, freelance sustainability consultant, Germany
Daniel WEISS, Adelphi, Germany

2.3. New currencies to support sustainable decision making for the transition to circular economy

Lais MUJICA RONCERY, Universidad Pedagógica y Tecnológica de Colombia, Colombia

Laura AMÉZQUITA, Universidad del Rosario, Colombia

2.4. Innovative financing mechanisms to drive a circular economy

Hayoung LEE and Rana KARADSHEH, IFC (World Bank Group), Singapore

2.5. ValuCred: Integrating principles of circularity into global supply chains from a social business perspective

Christina JÄGER, Yunus Environment Hub, Germany

development finance due diligence

**2.6. Building sustainable garment value chains:
Implications for developing countries**
Izumi OHNO, National Graduate Institute for Policy Studies
(GRIPS), Japan

2.7. On (over)consumption in the clothing industry
Taylor BRYDGES, Research Principal at the Institute for
Sustainable Futures at the University of Technology Sydney,
Australia
Mary HANLON, Professor of Sociology at Okanagan
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**2.8. The textile industry – accelerating transformation
through future-oriented policy measures**
Burcu GÖZET, Henning WILTS, and Jan BITTER-KRAHE,
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**2.9. Practical implementation: Design as a precondition to
circular value chains in the fashion industry**
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**2.10. Circular value chains must enable social and
ecological due diligence**
Holger KUHLE, GIZ, Germany
Jorge GÓMEZ-PAREDES, UN-SDSN Andes, Ecuador

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2.11. On the future of furniture manufacturing

Frédéric MORAND, SAINTLUC, Italy

Interview with Martin KOCHAN, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany

2.12. The only sustainable way forward: Circular global value chains

Magdolna MOLNÁR, University of Regensburg, Germany

2.13. Implementation gaps in the enforcement of transboundary extended producer responsibility

Alex GODOY-FAÚNDEZ, UN-SDSN Andes, Chile

Jorge GÓMEZ-PAREDES, UN-SDSN Andes, Ecuador

2.14. Dealing with future complex supply chains and products: Two hypotheses

Siddharth PRAKASH and Clara LÖW, Öko-Institut, Germany

A dark blue Ferrari Century is shown from the rear, parked on a city street at dusk. The car's rear features the word "CENTURY" in large, spaced-out letters. The background shows a city street with traffic lights, a blue road sign with Chinese characters, and other vehicles in the distance. The scene is illuminated by the warm glow of the setting sun.

“According to recent estimates, trade in Global Value Chains (GVCs) accounts today for up to 70% of total trade. The emergence of GVCs has boosted growth across the globe but they also had non-negligible social and environmental costs. The post-pandemic recovery should be an opportunity to accelerate the transformation towards more transparent and sustainable GVCs.”

-Victor STOLZENBURG, Daria TAGLIONI, Deborah WINKLER

Image Source: Car manufacturing industries are among the most integrated supply chains in the world. They have been disrupted by the Covid-19 pandemic as many electronic components produced remotely are not available in assembling plants. The conversion to electric mobility following CO2 reduction targets is another illustration of profound changes. However, such transformations have not yet prevented the number of vehicles in circulation across the globe to continue rising steeply. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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Sustainable and inclusive global value chains as an opportunity for developed and developing countries

The growth of global value chains (GVCs) in the 1990s and 2000s has been one of the central developments in international trade. As coordination and trade costs fell, it became

increasingly attractive for lead firms to offshore certain stages of their production and form regional and global production networks. According to recent estimates, trade in GVCs accounts today for up to 70% of total trade (OECD, 2021).

The emergence of GVCs has significantly boosted growth across the globe. Countries at all levels of development experienced income gains as they deepened engagement in GVCs. Developing countries that became integral to GVCs – Bangladesh, China, Costa Rica, and Vietnam among others – experienced the steepest declines in poverty. The increased degree of specialization in GVCs enhanced efficiency and durable firm-to-firm relationships promoted the diffusion of technology and access to capital and inputs (World Bank, 2019).

GVCs also delivered better jobs by offering more formal, productive and capital-intensive activities. Greater productivity led to an expansion in firm output and thus to increases in employment. Indeed, cross-country evidence and case studies show that GVC participation can on average be growth-enhancing and lead to economic and social upgrading (World Bank, 2019).

But participation in GVCs has also had non-negligible social and environmental costs. The environmental costs of GVCs are directly related to its growth effects: more economic growth led to more consumption and hence en-

vironmental degradation (Sommer and Taglioni, 2022), and more distant trade in intermediate goods has also brought greater maritime pollution, more CO2 emissions, and excess waste.

The initial rise of GVCs occurred in a time when few firms had explicit environmental or social governance (ESG) goals. Rather, efficiency gains and labor cost differentials have been the driving force behind sourcing decisions up to the 2013 Rana Plaza disaster in Bangladesh, a turning point in GVCs. Since then, most lead firms developed serious ESG frameworks. But public and private strategies to counter the opacity of global value chains are still work in progress. This was apparent during the COVID-19 pandemic, which has also demonstrated that untransparent and unsustainable practices along the whole chain lower the resilience of GVCs during crises (WTO, 2021).

The post-pandemic recovery offers an opportunity to accelerate the transformation towards more transparent and sustainable GVCs. This holds especially because the momentum of the pandemic coincides with both a greater adoption of digital tools – necessary to enhance transparency in GVCs – and a growing political impetus to address climate change, as was most recently felt during COP26. Bringing transparency and – in some cases – reconfiguring GVCs plays a vital role in both recovery efforts and in the energy transition.

However, some countries are reluctant to embark on a green transition. This is partly due to the discordant views over the polluter pays principle versus the beneficiary pays principle. They reasonably argue that the countries responsible for the majority of emissions today and over the past decades should carry the primary burden of greening the world economy (Massenberg, 2021). But it is also driven by the concern that investments in greener production standards could hamper the competitiveness of developing economies by eroding their cost advantages.

In recent research, we show that these concerns might be misguided (Stolzenburg, Taglioni and Winkler, 2019). Using empirical tools, we show that countries benefit more from GVC integration if they adhere to social and environmental standards. We show, for instance, that higher levels of air pollution in production reduce GDP gains related to GVCs. In contrast, a higher number of environmental ISO standards increases GDP gains. We obtain similar findings for social and labor indicators such as stronger adherence to ILO conventions or lower wage inequality.

Our research also highlights that the positive role of environmental and social sustainability is stronger when providing inputs rather than buying inputs from abroad. This is consistent with the view that as final consumers have become more sensitive to unsustainable production, implementing fairer and greener production processes may not only be desirable but also beneficial. Instead of eroding

cost competitiveness in developing countries, suppliers complying with sustainable production standards become increasingly attractive to lead firms that wish or are under pressure to fulfill sustainability targets.

Sustainability and competitiveness in GVCs are by no means mutually exclusive, as highlighted by our research. Instead, these two factors can reinforce each other. This should alleviate concerns that a transition to a net-zero emissions economy widens the inequality between developed and developing countries. If lead firms and final consumers are willing to share the burden of greening the economy, suppliers in GVCs may be more likely to consider this transition as a chance to enter new markets with higher profit margins, which in turn will also help accelerate development.

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Who
made
my
clothes?

“Over the course of the last decade, we have witnessed a regulatory push in the Global North, requiring companies to enforce supply chain due diligence.”

-Katja KRIEGE, Daniel WEISS

Image Source: Wikimedia Commons. April 22, 2015. A protestor holds a poster to promote the #WhoMadeMyClothes movement and shows off a clothing tag that displays where the scarf was manufactured. Photo Credit: marissaorton.
https://commons.wikimedia.org/wiki/File:Who_Made_My_Clothes_Poster.jpg



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How do regulations for due diligence and circularity match up?

Over the course of the last decade, we have witnessed a regulatory push in the Global North, requiring companies to enforce supply chain due diligence.

The 2010 Dodd-Frank Act was a landmark with regard to conflict minerals. We have also seen the adoption of the Modern Slavery Act in the United Kingdom in 2015, the Duty of Vigilance Law in France in 2017, and, in 2021 the German Supply Chain Due Diligence Act, to name a few. And this trend continues with more regulations currently being de-

veloped, in particular the EU Due Diligence Directive; the draft law was published in March 2022.

Conducting due diligence is about identifying, preventing, mitigating and accounting for how actual and potential adverse impacts are addressed in a system - within its own operations, its supply chain and through other business relationships.

Practice shows that companies feel particularly motivated to implement thorough due diligence processes when they are subject to regulation. Even though various observers and experts regard the legislation in place as not effective enough, there has been more due diligence practice enforced in the private sector.

Due diligence processes can address both human rights and environmental impacts. A key objective is to cease, prevent or mitigate adverse impacts. Severe adverse impacts can often be found at the beginning of supply chains when primary raw materials are extracted or processed.

There is a variety of possible actions a company can take to address negative impacts. In general, only the combination of several measures over a longer period of time has a major effect. This is why policy makers and companies alike need to explore (further) promising options.

Circularity solutions for sustainable supply chains

Circularity offers to substitute primary raw materials with recycled, secondary raw materials. Thus, it offers the potential to reduce or cease negative impacts related to primary raw materials.

Does this mean we achieve a perfect match? Several potential implications and questions come into mind.

Let's take the example of lithium-ion batteries which are used for electric vehicles. Various minerals, including copper, cobalt and lithium, are used in these batteries. Their extraction is associated with severe negative human rights and environmental risks.

Several of the minerals are also scarce, such as lithium and cobalt. Today, around 32 million electric vehicles exist, of which 8 million are BEV (battery-powered electric vehicles). It is predicted that these numbers will increase by 25% per year until 2030. It goes without saying that this in turn increases the pressure on raw material availability.

The increased demand for these raw materials may also incentivize recycling. Experts suggest that direct recycling is more attractive than a second life of the battery, e.g., for energy storage. An apparent market potential and preparations for a thriving battery recycling market can be observed in the Global North and South alike. For example,

Redwood, a 4-year-old start-up in the US, scored US\$ 700 million risk capital in 2021, the 5th highest amount that was granted that year. Alternatively, take Gravita India, the biggest battery recycler in India which announced its venture into li-ion battery recycling. The company also plans to recycle in different African states, providing a change in the previous process of importing scrap to India for recycling.

Given that implementing human rights and environmental due diligence upstream of value chains can be challenging, it makes more sense to look at circular solutions. Due diligence risk assessments need to be carried out for specific supply chains since the severity and likelihood of negative impacts depend on several factors. This includes, for instance, the geological situation, whether open-pit or underground mining is needed, whether only large-scale or artisanal mining is (also) taking place, whether state-of-the-art technology is in place, (e.g., filters to prevent pollution or best practice safety measures) or whether the mine is located directly in or in the proximity of an area that is highly populated or has a high biodiversity value. The cost of implementing due diligence across the value chain could increase the cost factor of primary raw materials. In turn, this could increase the attractiveness of secondary/recycled raw materials.

To conclude, the case of more circularity for EV li-ion batteries illustrates that several scenarios and dynamics between due diligence and circularity can be sketched out.

The rising demand for batteries will continue to require primary raw materials and thus respective due diligence processes. Like any other processes, battery recycling will also need to be part of due diligence processes to prevent impacts such as labor exploitation or environmental pollution. In the case of li-ion batteries, recycling is currently regulated differently across countries, and the lack of standardization of the battery models makes disassembling and reassembling of batteries a largely manual process.

Thus, a comprehensive set of factors should be considered when setting the frameworks for these recycling markets, and the consequences this may have for the primary raw material markets. Since the li-ion battery recycling market is a new one, it provides us with the opportunity to get things right from the start.

Selected links:

https://www.europarl.europa.eu/doceo/document/TA-9-2021-0073_EN.html

<https://www.oecd.org/investment/due-diligence-guidance-for-responsible-business-conduct.htm>

<https://electricvehicles.in/gravita-india-largest-battery-recycling-firm-enters-into-ev-recycling-business/>

<https://www.forbes.com/sites/alanohnsman/2021/07/28/redwood-materials-raises-700-million-in-race-to-revolutionize-battery-recycling-for-electric-cars/>

<https://www.bcg.com/publications/2020/case-for-circular-economy-in-electric-vehicle-batteries>



“As a mechanism, new currencies should be involved to support decision making, creating a new table of values and incentives around sustainability such as transparency, reputation, carbon neutrality, fair work, etc.”
-Lais MUJICA RONCERY, Laura AMÉZQUITA

Image Source: Waste buyers in the city of Kanchanaburi in Thailand purchase waste that is not suitable for recycling. This is an example of complementarity between formal and semi-formal sectors of the economy and the development of secondary markets that support the circular economy. Polystyrene waste. Photo Credit: Photo from Jinnaritt, 2018, <https://fr.depositphotos.com/stock-photos/kanchanaburi-waste.html?qview=291490110>. Rights by Nicolas J.A. Buchoud.



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New currencies to support sustainable decision making for the transition to circular economy

Circular economy proposes a production model that adds value and extends the lifecycle of resources. In this model, both production and consumption determine how the system functions. Similar to the classic competition economic model, supply and demand establish prices and quantities (produced and demanded). In the frame of the Sustainable Development Goals (SDGs), mutual responsibility lies within both the productive processes and consumption realm. We will focus on the consumption side and the exchange relationships involved.

The exchange of products and services requires a medium that allows them to participate in the market, and to express preferences and needs of the consumers. That medium is money. A currency synthesizes human relations of exchange, for example through giving and receiving, or investing in an idea. Currencies have emerged to play a role as a vehicle in our exchanges. In addition, they act as units of quantification and help to standardize values, known as market prices.

A currency should be neutral, should not disfigure prices, and exchanges should not be vulnerable to misinformation and tendencies. Intangible currencies have to express the implicitly agreed upon value of each production step and each consumption decision.

In order to transition to a circular economy, tangible currencies must be included. As a consumer, one does not know exactly the real value of the product (i.e. human capital, technology, and resources invested) as well as social and environmental impacts generated from its production. All these factors should be reflected in the market price of the product under consideration. However, current pricing mechanisms do not reflect the factors already mentioned. How can we adapt our economic systems before our resources run out?

Classical economic theories inform us about relative prices and currency as a vehicle. We assume that one dollar is one dollar, in the country where it is issued and in the place

where it is accepted. We assume that the price of a merchandise sums up the effort, care, resources, impact and commitment of those who labored to put it in the market.

Nowadays, global markets for primary materials and technology exist. In this context, exchanges are faster and more difficult to trace. Our current system leads to distorted market prices, where consumer choices are not based on real and clear product information. Prices and currencies are biased by lack or absence of information.¹ Trusting the price tag and assuming that money functions as a neutral unit of account is insufficient. Today, relative prices of products and services are inaccurate and volatile. However, the pricing mechanism is not assigning the true value of goods. Therefore, circular economy should go beyond aspects such as recycling, reusing, or sharing. It must transform the economic logic of exchange.

We also observe that prices encourage non-responsible production and consumption. The consumer is accused of preferring single-use plastic to protect themselves from COVID-19, of choosing cheap and disposable clothing to stay warm in the winter, of expending vast amounts of energy in the summer with air conditioning systems, among others. On the other hand, the producer is challenged by the pressure to minimize costs to earn more. Market research exercises have shown that the informed consumer would be willing to pay more if better information is incorporated into the decision-making process.² In that light, many companies have

decided to invest in research and development departments. Consequently, these additional costs are passed onto their consumers.

The consumers, however, have stayed out of this matter. Do they still innocently believe in the price mechanism and nothing else? Another latent problem that must be reminded about the quality of the information. People trust prices because a currency seems tangible, and less susceptible to be perceived subjectively as compared to reputation, honor, traditions, or other values, which are not easily quantifiable.¹

Monetary exchange cannot resolve the complex problems relating to the use of limited resources. Hence, it cannot be established as the single decision-making factor. The polluter pays principle³ was novel at one time, but today it is inadequate.⁴ The regulator imposes a penalty, but does it really help to prevent or repair? Another aggravating circumstance is that penalties are ex-post measures. Perhaps the damage has already been done, and it is irreversible.

Aspects such as fair work, fair trade, carbon neutrality, clean energy, water and air quality, among others, could also be the subject of a vicious monetized pricing mechanism. If we recognize that the same logic used by pricing mechanisms could encourage sustainable practices, it could be more effective than the penalization of vicious conduct - create incentives not only to stop the disaster, but also to encourage responsible behavior.

Costs relating to researching and investing into clean technologies and the risk of assuming a clean process discourages the industry from innovating in this direction. For the consumer, the problem starts from making decisions based on market prices. As a mechanism, new currencies should be involved to support decision making, creating a new table of values and incentives around sustainability such as transparency, reputation, carbon neutrality, fair work, etc. In this way, an ex-ante incentive is created. Both consumers and producers require, in principle, transparency and quality in the information they provide and receive respectively, which could then be expressed in market prices and in new currencies.

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A photograph of a man walking through a vast landfill of plastic waste. He is carrying a large, full bag of waste on his shoulder. The ground is covered in a thick layer of discarded plastic, and the background shows a horizon line under a cloudy sky.

“The paradox is that plastic waste has significant material value that is currently not being fully tapped on when plastics are disposed via landfill or incineration, or are downcycled.”

-Hayoung LEE, Rana KARADSHEHA

Image Source: Wikimedia Commons. December 9, 2012. Thilafushi. Photo Credit: Dying Regime. [https://commons.wikimedia.org/wiki/File:Piles_of_plastic_waste_in_Thilafushi,_2012_\(6\).jpg](https://commons.wikimedia.org/wiki/File:Piles_of_plastic_waste_in_Thilafushi,_2012_(6).jpg)



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Innovative financing mechanisms to drive a circular economy

PET, or polyethylene terephthalate, is the inexpensive, versatile plastic used to make bottles, food containers and other modern conveniences. It is a highly valuable and readily recyclable material. However, there is not enough waste collection and recycling capacity for it in many countries in South and Southeast Asia. PET and other plastics stay in the environment for hundreds of years, and when exposed to sunlight and seawater, they fragment into microplastics that are consumed by marine life. Eventually it makes its way into the food chain resulting in unknown health impacts. More robust global recycling efforts would go a long way

towards integrating the plastics value chain into a circular economy, where waste is managed as a valuable resource and reclaimed, reprocessed and ultimately used as feedstock for new plastic products. This would benefit the environment in multiple ways. It would result in less fossil fuel feedstock used to make virgin plastic, with significant reductions in greenhouse gas emissions. Moreover, less discarded plastic would pile up. Important progress has already been made along those lines, but much more is needed if the world is going to reduce up to 13 million tons of plastic leaking into the oceans every year.

The biggest challenge in this regard is modernizing and rationalizing waste collection and processing systems. Right now, collection and segregation of recyclables is very fragmented and underdeveloped in many emerging economies, where informal waste pickers scour junkyards and landfills for sellable recyclables, often operating outside of municipal solid waste management systems. Estimates vary greatly but globally at least 250 million metric tons of plastic waste is generated annually and only about 14 percent gets recycled.

Even in developed countries like South Korea, collection can be uneven and recycling expensive. South Korea recycles more than 50 percent of its overall waste, which is one of the highest rates in the world; but the country also has the highest rate of plastic consumption per capita. Given the high rate of plastic consumption, the government has set an am-

bitious target of reducing its plastic waste by half, by 2030, while doubling its overall average recycling rate from 34 percent to 70 percent. For PET alone, Korea's consumption was around 300,000 tons in 2019, of which 245,000 tons of used bottles were sorted and collected.

The paradox is that plastic waste has significant material value that is currently not being fully tapped on when plastics are disposed via landfill or incineration, or are downcycled. This represents a lost business opportunity especially for the private sector, since demand for recycled plastic is increasing globally for food and beverage applications. Plastic manufacturers and global brands, spurred by environmentally-conscious consumers and government regulations, are helping to create a new market for recycled materials. Many consumer goods companies, such as Coca-Cola and Danone, and retailers, such as Walmart, have made public commitments to increase recycled plastic content in their packaging or products. In addition, the European Union has mandated a minimum of 25 percent recycled content in PET bottles by 2025 and 30 percent by 2030, thus creating a strong enabling environment for recycled PET. In January, S&P Global Platts Analytics predicted that even though higher grades of recycled PET will cost around \$150 per metric ton more than virgin PET in the medium term, many manufacturers are willing to pay the premium because the alternative is a tax of 800 Euros per metric ton of unrecycled discarded plastic, under a new plastics tax.

The International Finance Corp's strategy is to support companies so that they embrace circular (reduce, reuse and recycle) interventions. They offer flexible financing options to address any project, technology, business model or supply chain risks associated with the circular economy.

With its first ever blue loan exclusively focused on addressing global marine plastic pollution, IFC committed \$225 million to help Indorama Ventures expand its food-grade PET recycling capacity. IFC teamed up with one of the world's biggest producers of virgin PET resins to address ocean pollution and accelerate efforts towards a more circular plastics industry, where reusability and recyclability become commonplace. Blue loans are an innovative financial instrument that is earmarked for ocean conservation projects. Commercially viable solutions, supported by such blue financing solutions, are particularly important given the magnitude of the problem, which cannot be addressed through public investments and socially driven initiatives alone.

The Thai-based multi-national has committed to quadrupling its PET recycling capacity and diverting 750,000 tons of plastic annually from landfills and open dumps; it also commits to help avoid leakage into waterways. To put the effort into context, Indorama will recycle 50 billion PET bottles every year in Brazil, India, Indonesia, the Philippines and Thailand - countries that are particularly vulnerable to ocean pollution because of their dense coastal populations and reliance on fishing and tourism. This effort alone is expected to save

3 million barrels of crude oil and eliminate 1.65 million tons of carbon pollution that would have gone into manufacturing new bottles. The IFC-led loan package, with the participation of the Asian Development Bank and the Deutsche Investitions- und Entwicklungsgesellschaft, complemented by a \$75 million green loan to finance renewable energy and energy efficiency projects - will serve as a prototype to accelerate circular economy models. Simultaneously, it encourages a business case for building bottle-to-bottle capacities so that other recyclers and PET bottle producers can leverage on their partnership with brands. It demonstrates the convening power within the market.

South Korea has already stepped up regulations on single use plastics, including better labeling to facilitate more efficient waste segregation and recovery of clear PET bottles. However, more can be done to create a truly circular economy and a closed-loop recycling process. South Korea can set an example for other countries in Asia by developing appropriate definitions, policies and standards for food-grade PET recycling, with a view to an eventual harmonization across the region. As the Indorama example illustrates, the business case for bottle-to-bottle PET recycling is already viable and the support of innovative financing solutions, such as blue loans, can be used to promote further scaling up by the private sector. The South Korean government recently announced that it would promote the use of recycled PET in making food containers. Introducing such regulations to allow and encourage food grade bottle-to-bottle recycling

using mechanical recycling technology, which is already allowed in other developed markets such as the United States, the European Union and Japan, will support the South Korean government's ambitious targets of reducing plastic waste and driving a transition to a circular economy.

“Informal waste pickers, who carry out most of the collection work at the bottom of waste value chains, hardly benefit from today’s compensation schemes.”

-Christina JÄGER

Image Source: Wikimedia Commons. February 23, 2017. Waste pickers in the Philippines Oceanic Container Lines, Inc. for drainage improvement, slums in Manila Barangays (Capulong Bridge). Photo Credit: Judgefloro. https://commons.wikimedia.org/wiki/File:0458jfc-15_Road_Capulung_Raxabago_Streets_Bridge_Estero_de_Vitas_Tondo,_Manilafvf.jpg



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ValuCred: Integrating principles of circularity into global supply chains from a social business perspective

According to estimations by UNEP, 3.5 billion people don't have access to proper waste management services – this is nearly half of the world population. Especially in low-income countries, the collection of recyclables depends almost entirely on the informal sector. Informal waste workers are amongst society's most marginalized groups with no recognition of their valuable services, often being deprived access to sustainable income sources and basic social services.

How can we make waste management and recycling inclusive, transparent, and sustainable?

Global brands need large amounts of different secondary materials in order to fulfill their ambitious circular economy goals, especially in the recycling of plastic packaging. Systematic improvements of waste collection and treatment services are urgently needed to address gaps in infrastruc-

ture development and provision of adequate remuneration for all workers along the waste value chain. Such improvements require adequate funding sources, most often not available due to the lack of national Extended Producer Responsibility (EPR) schemes.

A credit system based on plastic waste (plastic credits) is a new financial instrument that can help countries establish financially and socially sustainable waste management infrastructure and operations, and companies to increase circularity in their supply chains. For the transparent calculation and valorization of plastic credits, a new and innovative approach is needed. Contrary to other credit systems applied to plastic waste management, which often means transferring the operating principles of CO2 emissions trading (i.e. one tonne in, one tonne out), ValuCred is developing a standardized process model (SPM) taking into account the different costs of waste collection and treatment in the country where the waste was created. The valuation depends on the type of plastic and the country's living wage line. Such a model could be replicated internationally and supported by digital solutions to ensure transparency along the supply chain.

Besides its environmental impact, which is widely known and visible, the plastic waste crisis has a social dimension. Unfortunately, this dimension is mostly sidelined in today's compensation schemes. For example, informal waste pickers who carry out most of the collection work at the bottom of waste value chains, hardly benefit from today's plastic

compensation schemes. Even if they are included in compensation schemes, waste pickers are only compensated for the quantities of waste they collect - their productive working hours are not accounted for. To ensure that benefits of plastic credits are not enjoyed exclusively by production companies, a set of social business recycling companies should be created as intermediaries which sell waste to the production companies at a socially efficient price. This setup would ensure fairer compensations for the pickers.

ValuCred aims to align the interests of global stakeholders and promote collaboration amongst existing initiatives for plastic credit markets. The ValuCred SPM is based on global best industry practices such as ISO and GRI standards. It also incorporates the relevant social metrics of the UN SDGs as well as considers and refers to relevant international regulatory frameworks, such as the Basel Convention and national EPR schemes.

In its most recent report in 2021, ValuCred shared its analysis of different voluntary standards¹. The report was based on extensive market research. It also offered its perspective on innovative impulses in the emerging plastic credit market. Most importantly, the report called for a paradigm shift - the integration of social justice and transparency in the accounting mechanisms of plastic credits, which is commonly agreed upon yet rarely implemented. If done so successfully, plastic credits have the potential to serve as a financial instrument to provide a lasting source of income for low-in-

come groups such as informal waste workers in developing countries. While it is a noble goal to end poverty, our target must be more ambitious and ensure living wages for all.

In 2022, the ValuCred SPM will be piloted through our waste management operations partners in five countries across Asia, Africa and Latin America. The ValuCred SPM will be subsequently adapted according to user feedback. The first version of the ValuCred SPM will be published at the end of the year; further tests and developments are also planned. Interested stakeholders are welcome to express their interest in collaboration.

ValuCred is a consortium led by Yunus Environment Hub, Nehlsen & Rodiek, and BlackForest Solutions for the design and financing of sustainable plastic waste management systems. ValuCred is one of the first projects promoted by PREVENT Waste Alliance, with funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Röchling Stiftung.

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1. You can download the report at <https://yunusenvironmenthub.com/valucred/>



“The garment industry is a typical ‘starter’ industry for low-income countries. There is rising awareness of the need to strengthen social and environmental compliance, in addition to conventional requirements for quality, cost reduction, and on-time delivery.”

-Izumi OHNO

Image Source: Wikimedia Commons. October 11, 2013. A woman worker manufactures a garment in a project beneficiary factory - women constitute a significant portion of the workforce in Pakistan's garment industry. Photo Credit: USAID Pakistan. [https://commons.wikimedia.org/wiki/File:USAID%27s_Firms_Project_\(10587583886\).jpg](https://commons.wikimedia.org/wiki/File:USAID%27s_Firms_Project_(10587583886).jpg)



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Building sustainable garment value chains: Implications for developing countries

The garment industry is a typical “starter” industry for low-income countries that promote export-oriented industrialization. For latecomer countries, apparel production serves as the first entry point into global value chains (GVCs) with its low fixed costs and labor-intensive manufacturing.

Because it is labor-intensive, the garment industry contributes greatly to job creation in low-income countries, especially for young female workers. On the other hand, if it is not properly managed, the industry may generate labor mistreatment and exploitation. There is rising awareness of the need to strengthen social and environmental compliance in the sector, in addition to conventional requirements for quality, cost reduction, and on-time delivery (QCD). More recently, with increasing attention to the Sustainable Development Goals (SDGs) and the ongoing global economic restructuring in response to the COVID-19 pandemic, there

is a strong drive among international investors and buyers to give greater attention to labor conditions, human rights, and environmental standards.

Today, latecomer countries must satisfy twin global standards—economic and industrial upgrading as well as social and environmental upgrading—to successfully participate in the garment GVC. Both requirements are crucial in securing market access and raising productivity. At the same time, we should recognize that complex and proliferating standards set by lead firms, international organizations, and non-governmental organizations (NGOs) are placing a considerable burden on apparel firms in developing countries that face resource and technical constraints. Coping with these mounting demands of both types is crucial for garment producers in developing countries with limited human and financial resources.

The author’s recent paper as part of a joint research between the GRIPS Development Forum and the Ethiopian Policy Studies Institute (PSI) suggests five common issues that should receive attention by latecomer garment producers and governments, as well as foreign buyers, lead firms, and the development community when promoting both economic and social upgrading of garment value chains.

First, the governments and garment factories in developing countries need to take an integrated and balanced approach to acquire and continue to upgrade export capability in the

face of many required standards. Although there is increased attention to the importance of compliance measures in recent years, we should also recognize that social and environmental gains can be sustained only if firms successfully keep upgrading their products and processes in the economic sphere. This is because enhanced standards require investments in human capital, technology, and machinery, such as building safety.

Second, there is a need for harmonization efforts among buyers, the international business and development community for supporting the capacity building of producers in developing countries. Our research finds a problem in “compliance fatigue” associated with the proliferation of standards and compliance measures. This is among the most pestering concerns of garment exporters regardless of nationality or location.

Third, public-private partnerships and the role of industry associations are important. Industry associations of the exporting country play an especially crucial role in developing the capacity of local garment producers to make quality and productivity improvements as well as meet social and environmental compliance standards. In Bangladesh, two large textile and garment industry associations actively support their member firms and in turn entice government incentives and programs for this purpose. In Sri Lanka, a public-private partnership initiated by a leading local firm effectively contributed to formulating the post-Multi-Fiber Agreement

(MFA) strategy with the government.

Fourth, buyers, lead firms, and donors should enhance their external support to upgrade industry associations, local factories, and the policy capacity of their partner governments. The experiences of today’s major apparel exporting countries suggest that knowledge and technology transfer from FDI partners and buyers is critically important in establishing a modern export-oriented garment industry. In the early 2000s, Myanmar started to learn quality control and technical skills of garment production through Japanese cooperation, which provided the basis for subsequent learning of social compliance measures through cooperation with the EU.

Lastly, an integrated and comprehensive approach will be more keenly needed in the post-COVID-19 era, which heightens the need for a human-centered approach and green recovery.

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This article is based on the author’s recent paper, “Pursuit of Product Quality and Ethical Correctness in Developing the Garment Industry” (co-authored with Sayoko Uesu), Chapter 7 in Ethiopia FDI Policy Report 2022, joint research by the Policy Studies Institute (PSI) and the National Graduate Institute for Policy Studies (GRIPS).
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“Changing consumer and cultural mindsets around (over)consumption is a much-needed discussion for the apparel industry, as is the need to embed circular economy principles to close the loop on its linear take-make-waste model.”

-Taylor BRYDGES, Mary HANLON

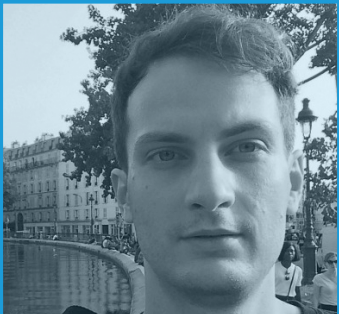
Image Source: The start-up hub of 'Station-F' in the 13th district of Paris, a multi-functional space praised by the start-up community, housed in a former warehouse. It was transformed into a vaccination center during the height of the Covid-19 pandemic that hit France and Europe in the winter of 2021-2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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On (over)consumption in the clothing industry

Martin KOCHAN (MK): The clothing industry has a significant environmental footprint with respect to carbon emissions and water pollution. What can policymakers do to reduce the environmental impact?

Taylor BRYDGES (TB) and Mary HANLON (MH): The global fashion and apparel industry overwhelmingly operates on a model that prioritizes economic growth over environmental and social sustainability concerns. When designing interventions to mitigate environmental challenges related to the global fashion and apparel sectors, policymakers should avoid outsourcing responsibility solely to consumers. Addressing the environmental impact of the fashion industry will require meaningful dialogue between stakeholders across production networks, recognizing both the uneven power dynamics between stakeholders as well as their diverse and often divergent interests. Instead of imposing top-down approaches, policymakers should also consider the social and cultural behaviors of the industrial actors and acknowledge that the very nature of global production networks requires systems-level thinking.

Globally, we are now seeing examples of policymakers taking leadership roles in establishing frameworks to address the environmental impact of the fashion industry. For example, France introduced an Extended Producer Responsibility (EPR) framework for end-of-life textiles which has significantly increased the collection and recycling of post-consumer textiles. In Australia, the Commonwealth Government recently announced a AUD 1,000,000 grant through its National Product Stewardship Investment Fund for an industry-led product stewardship scheme for clothing textiles. In the coming years, there will be increasing opportunities for policymakers to share experiences and

learn best practices. In the meantime, we should be wary of any product stewardship strategy that hopes to address 'waste' without first engaging in meaningful stakeholder dialogue.

MK: COVID-19 has disrupted supply chains globally and heavily impacted the garment industry. What exactly were the effects for the Global South?

TB and MH: Garment sector workers continue to be among of the most affected by the ongoing COVID-19 pandemic, which has only served to exacerbate longstanding worker health and safety concerns in the sector. While COVID-19 has disrupted the sector globally, the effects on garment workers in the Global South have been particularly significant and widespread. There have been several impacts, from factory owners being unable to pay their workers when large fast fashion brands abruptly canceled orders for garments that had already been made, to increased instances of brutal union-busting in Southeast Asia as one response to the economic uncertainty in the sector. Home garment workers - who typically lack formal employment contracts- and migrant workers have also been negatively impacted as they are often excluded from the minimal financial support offered by brands, manufacturers and/or governments.

Since the beginning of the pandemic, the Clean Clothes Campaign has been documenting the impact of COVID-19 on

garment workers around the world through their live blog. As their reporting illustrates, these impacts continue to be felt by garment workers in the Global South.

MK: Textile recyclers complain that the volume of discarded apparel is rising while their quality is decreasing. How can incentives be set to reduce consumption while improving quality?

TB and MH: This is certainly a challenge! Fast and ultra-fast fashion is premised on a low-cost business models that rely on fabric blends that are cheaper to produce. But as we also know, these fabric blends are difficult to recycle. There are some exciting global examples of recycling businesses engaging in a range of technological innovations to improve these processes and separate fibers so that they can be reused.

There are also challenges around developing the necessary infrastructure to collect and recycle clothes, which would, in turn, support the development of textile recycling businesses. Most end-of-life clothing textiles are landfilled or incinerated. Moreover, particularly in the Global North, we have come to over-rely on the charitable sector to manage the growing amounts of end-of-life clothing textiles. Pinpointing what happens to donated clothes largely remains a 'black box' although we are increasingly seeing that only a small percentage of donated clothing stays in our local communities and the majority is sold into the global

second-hand clothing trade, which has significant environmental and economic implications for garment-importing countries such as Kenya, Ghana and Chile.

Changing consumer and cultural mindsets around (over) consumption is a much-needed discussion that the industry has been quite successful in avoiding. As these examples have shown, much of the application of the circular economy to the fashion industry is focused on waste or end-of-life. Also a concern is the notion that strategies to manage end-of-life might fuel an increase in product consumption. A broader conversation is needed about how circular economy principles can be embedded across the industry to truly close the loop on its linear take-make-waste model. This includes designing for circularity, whether by using better quality input materials, that have longer lives and can be repaired, or through design interventions that support garment longevity.

MK: Major fast fashion companies such as H&M have launched take-back schemes where consumers can return used garments in the stores. To which extent are such programs effective in closing the loop and how much is this mere greenwashing?

TB and MH: It is important to be realistic about what take-back schemes can and cannot do. Clothing take-back schemes can help divert clothing from landfills, but it is often misleading when a brand implies that a garment

returned to it through a take-back scheme will find its way back into that store as a new garment. Rather, brands like H&M partner recycling businesses who then find other uses for old garments such as downcycling into insulation or rags or selling the clothing in second-hand markets.

Take-back schemes can therefore contribute to resource recovery but not necessarily to a closed-loop fashion system because very few returned items are turned into new garments. The Ellen MacArthur Foundation has reported that less than 1% of the material used to produce clothing is recycled into new clothing. While take-back schemes could potentially be an important part of closing the loop in the fashion industry, in their current forms, these programs are highly susceptible to greenwashing.

MK: In recent years, new business models, such as fashion rental platforms, have gained popularity. Are these pieces of solving the puzzle of our linear take-make-waste model of consumption?

TB and MH: Fashion rental platforms are part of the story but as we have seen with other circular economy interventions in the industry, the devil is in the details. Fashion rental platforms could be important in providing consumers with an alternative to clothing ownership, particularly for rarely-worn garments such as formal wear, thus improving clothing utilization i.e., the number of times an item is worn or reused, thereby reducing the need for multiple gar-

ments and consequent greenhouse gas emissions. Rental platforms, however, do very little to address the social and environmental sustainability challenges facing the industry at the earlier stages of supply chains (especially take and make). Very few rental platforms are focused on the rental of sustainable clothing brands. Using a rental platform may also allow customers to continue consuming in trend-driven ways, without critical reflection on where their clothing comes from and how it was made.

There are many questions about the environmental impact of fashion rental platforms. Some research has raised concerns about the rebound effect, whereby the savings of using a rental platform are negated by other forms of consumption. Others have raised questions about the environmental impact of rental processes such as emissions from transportation and dry cleaning. The financial viability of the platform model has also been called into question during the pandemic and it remains to be seen how many rental platform businesses survive this crisis.



“The accelerated consumption and the under-utilization of textile products have been two of the resulting phenomena of the textile industry’s development.”

-Burcu GÖZET, Henning WILTS, Jan BITTER-KRAHE

Image Source: Wikimedia Commons. April 16, 2008. Asta Hombre is an Arab designer in Egypt who is looking to find clothes for men who love to wear cloth from the wholesale store of urban retail style. He is searching for perfect urban outfits with trendy T-Shirts on the shelves of abundance in the professional business of an apparel merchant.

Photo Credit: epSos.de .

https://commons.wikimedia.org/wiki/File:Men_Shopping_for_Clothing_Accessories.jpg



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The textile industry – accelerating transformation through future-oriented policy measures

Within the past few decades, the textile industry became one of the world's largest economies. The production volume of textile fibers has tripled since 1975 and is expected to further

double by 2030.¹ Aligned with mass production, this trend has been made possible through a continuous drop in production costs² based on, inter alia, outsourcing activities of production processes to low-income countries. The simultaneous tendency and trend to select lower quality textiles has led to a decrease in prices, making cheap mass-produced garments accessible to a wide audience.³ The accelerated consumption and under-utilization of textile products have been two results of the textile industry's development.

Given the fact that the textile industry is based on a linear system, the sector is designed to require large volumes of raw materials and to discard them after usage.^{4;5} The tremendous environmental pressures related to the industry's activities are thus not surprising and can be directly linked to climate change, loss of biodiversity, water scarcity, and more.^{6;7} Whereas the industry's waste creation figures remain partly unknown, 92 million tonnes of waste is assumed to be generated worldwide every year, while prognoses state an increase of 60% within the period 2015 to 2030. A major share of this waste ends up in landfills or is incinerated while less than 1% is recycled into fibers.⁸

Against this backdrop, the transformation of the current linear textile industry into a circular system serves as a pressing issue in meeting the Agenda 2030 and remaining within planetary boundaries. A circular textile industry foresees to "produce neither waste nor pollution by redesigning fibers to circulate at a high quality within the production and

consumption system for as long as possible and / or feeding them back into the bio- or technosphere to restore natural capital or provide secondary resources at the end of use”.⁹

As the textile value chains are highly complex and globally intertwined, only a systemic circular economy approach scoping all phases of the value chain, such as the design, business, consumption, and end-of-life-phase, can sufficiently transform the industry. The measures for each phase are manifold and can involve a circular design of products (or “design-for-recycling”), alternative and service-oriented business models, repair and resell activities, or innovative recycling solutions. While much progress has been made around the globe in the implementation of circularity measures by both businesses and consumers, the usefulness of classical environmental policy instruments has been exhausted. Future-oriented policy measures that are able to cope with the industry’s complexity and accelerate the transformation efforts proactively are now needed.

This necessity is being increasingly recognized by EU policymakers, as the textile industry is a key sector for applying circular economy measures. Here, waste prevention is plays a key role. This was the clear outcome of the recent progress report on waste prevention that was coordinated by the Wuppertal Institute on behalf of the European Environment Agency.¹⁰

The assessment of the policy background on textile waste prevention has highlighted various European regulations that are at least indirectly linked to textile waste generation, such as the Textile Regulation on textile fiber names and related labeling and marking of the fiber composition of textile products ((EU) No 1007/2011), the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation ((EC) No 1907/2006) and the EU Green Public Procurement Criteria for Textile Products and Services. All these regulations focus on reducing the environmental impact per item; they do not focus on a reduction of production or consumption of textiles per se.

At the national level, various measures have been set out by Member States to address textile waste. An assessment of all current national and regional waste prevention programs has identified 40 specific measures (e.g., the reuse of textiles, the ban of destructing returned textile products). However, closing communication gaps between stakeholders, implementing ‘design for prevention’ and increasing transparency through traceability would accelerate textile waste prevention efforts.

Some programs include specific sub-chapters dealing with textile waste generation and linked environmental impacts. Nevertheless, only 6 out of 31 national and regional waste prevention programs include specific indicators on textile waste prevention. The majority of these indicators focus on the reuse of clothing and footwear. When it comes to targets,

it has been shown that none of the currently available waste prevention programs include quantified targets for textile waste prevention. This could be a major drawback in waste prevention efforts, as solid targets are a driver for comprehensive policies.

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A woman with dark hair, wearing a black top, stands in the center of a design studio, gesturing with her hands as she presents to a group of people seated at tables. The studio is filled with creative tools: a large format printer labeled 'Color P758' is in the background, and various sketches and posters are pinned to the walls, including one of a skull and another of bicycles. In the foreground, the backs of several audience members' heads are visible as they listen. A laptop and a bottle are on the table in front of the presenter. A semi-transparent text box is overlaid on the left side of the image.

“Projects such as downloadable bags that users can make themselves with pre-owned materials showcase how the user, a key stakeholder of the circular value chain, becomes a co-designer.”

-Cristina DAN

Image Source: VIA student design incubator. Image by Cristina Dan, all rights reserved ©.



Cristina DAN
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Practical implementation: Design as a precondition to circular value chains in the fashion industry

Katharina Lange (KL): Cristina, what inspired you to found SOLVE?

Cristina Dan (CD): I started SOLVE in 2016 to show that there are sustainable and responsible ways of creating fashion other than the fast fashion model. My aim was to be able to integrate fashion design within a circular economy framework. Our first project, Omdanne, showcased just that, as the world's first circular and multifunctional fashion collection.

KL: The fashion industry is known to be one of the most pol-

luting. Public pressure is increasing and major brands seem to be bowing to that by adding recycled material to their products or shifting production. Smaller and more conscious brands are popping up around the globe. What is the current state of the industry? Are we moving in a more circular direction?

CD: When it comes to circularity, the fashion industry is dealing with challenges that are of a structural (organizational and operational) and attitudinal (cultural and societal) character. The customer, a key stakeholder in the fashion circular economy value chain (CEVC), has a growing demand for sustainable fashion. The EU's Circular Economy Action Plan also places pressure on governments and the industry to adopt closed-loop approaches. However, moderation in consumption is a must; it has to be emphasized and addressed.

There are pockets within the global fashion industry that have started to work towards scaling up closed-loop recycling systems, and that is encouraging. However, it is difficult to recycle fabrics that are not, for example, mono-materials. Hence, the circular mindset and practice must be adopted at the design stage, where up to 80% of the environmental impact of a product is determined (European Commission, 2020).

Design dictates the set of resources, infrastructure, processes and activities that will be committed for each product. There is an impending need for knowledge within organiza-

tions on circular design strategies, means of connection to closed-loop production systems, circular business models and local circular operational framework. While on some fronts we are moving forward, it's at a painfully slow pace.

KL: Supply chains today are highly complex and diversified so it is a challenge to involve all stakeholders. How can we better work together?

CD: Collaboration, negotiation, and co-creation amongst stakeholders across the value chain are essential for a circular economy. In the last two years, we have seen logistical bottlenecks and delays in manufacturing due to long supply chains. Resilient circular supply chains are those that are formed through close collaboration among stakeholders in the value chain and that have good stakeholder management. Close proximity of the stakeholders can be a strong enabler for the capability of forming such supply chains.

Moreover, as the DRIFT report shows, the industry is fragmented and the power relations amongst actors of the supply chain are unequal. Social and environmental risk is shared disproportionately, resulting in collective irresponsibility. Carrying negotiations and making use of participatory design processes with supply chain stakeholders is one way of creating a better understanding of everybody's needs, challenges and solutions to address them.

KL: You have worked in and with the fashion industry for

years; you are a designer yourself. Circularity is the essence of your creations and your work, and you emphasize the role of designers as well as individuals/users in the ideation process. What is your approach towards a circular economy transition?

CD: My approach towards a circular economy transition is a new design paradigm, based on participatory design. I describe myself as a contextual fashion designer. In the realm of circular design, context is everything. This means that in my design process, I take into consideration all CEVC stakeholders. This offers me a holistic overview of the textile and clothing flow and how to create cascades for circular resource management. The insights provided by the fashion CEVC stakeholders are key to potential solutions. Major emphasis is placed on changing user behavior as today's society is riddled by consumerism. By engaging the user in the design and/or fabrication process, we create greater attachment towards the product, thereby discouraging over-consumption.

SOLVE projects such as Omdanne, S-bags (downloadable bags that users can make themselves with pre-owned materials) or our upcoming project, ReFashion, showcase how the user becomes a proactive participant in the design process. The ReFashion project, in particular, aims to transform multiple circular value chain stakeholders into co-designers of a fashion CEVC via a new circular design strategy and IoT.

KL: You mention the Internet of Things (IoT) in your approach. How can it play a role in the fashion industry with regard to circular global value chains? Can you offer an example?

CD: Industry 4.0 technology is one of the key enablers for a circular economy. In our case, we would make use of digital technologies to create and capture value from product-service offerings, while also connecting manufacturers with customers and suppliers to co-create value.

Together with the team from the University of St. Gallen (Switzerland) - Chair for Interaction- and Communication-based Systems - we are putting together a project that aims to scale up the concept behind ReFashion at an industry-level. Essentially, ReFashion relies on a product-service-systems business model, grounded in a novel circular design strategy and a novel approach to automated manufacturing. It integrates support for product design, supply chain, manufacturing, take-back system, and recycling/upcycling. Our proposed approach supports companies who intend to close the loop, by enabling the reutilization of products and their components in the most effective way, through an innovative product design and manufacturing process. It is implemented through automated planning of manufacturing as well as recovery processes. We expect this approach to increase servitization in the supply chain and thereby enable scalable circular economies in the clothing industry.

Understanding Solve Studio's services for circularity
<https://www.solve.studio/>

[CIRCULAR] PRODUCT: work closely with clients towards creating a more intuitive connection between products, end-users and the ecosystem.

[CIRCULAR] BUSINESS DESIGN: business design needs to be aligned with the product design and the circularity strategy that goes in that design.

PRODUCT-SERVICE SYSTEMS: in the future via the ReFashion project.

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“Socio-environmental assessments and monitoring may facilitate the identification of sustainable business models, by internalizing the ecological and social costs, which are usually left out from economic calculations.”

-Holger KUHLE, Jorge GÓMEZ-PAREDES

Image Source: Intricate imbrication of manufacturing plants and dwellings are typical of situations of rapid development, pressuring existing planning and governance frameworks, often with high social and environmental costs that have added in the past decade. Here an aerial view of the surroundings of Surabaya, in the East of Java island in Indonesia, in 2010. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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Circular value chains must enable social and ecological due diligence

The world continues to be dominated by a linear economy that is based on a constant extraction of natural resources, and on intricate global production networks that are disproportionately geared to meet the demands of the Global North. For this insatiable economic system to operate, evermore land, water, minerals, fossil fuels, and sequestration pools to absorb its associated emissions, are required. Hence, the prospect of maintaining, let alone increasing, human prosperity based on an indefinite growth of a linear economic system is not realistic; It is incoherent and beyond

planetary boundaries. Such a system cannot be sustained in the long term and this impossibility is becoming increasingly clearer. The signs are everywhere - non-renewable resources are becoming scarcer and more expensive, the marginal costs of new production are rising in contrast to the cost of maintenance and repair, and the energy return on investment for non-renewable energy resources is decreasing, among many other trends.

A circular economy (CE) transition may offer a way out of this unsustainable situation. This would involve implementing a system that interconnects suppliers in multiple production and consumption chains, through “reverse supply chains”. These would maintain energy and materials extracted from the environment within the economy for as long as possible, thus addressing the pressing task of conserving natural resources. CE enables producers, investors, and consumers to propose answers to the main question raised by the Club of Rome in the 1970s: How can the finiteness of extractable resources, the basic material needs of a growing human population, and seemingly infinite consumer demands be reconciled? In fact, CE challenges this question by shaking up the prevailing economic paradigm. CE can be a major game changer for sustainability. Enabling the circulation of materials and energy requires the integration of production routes and the traceability of products as well as of end-of-life products as they move through the economy. All of these demand detailed monitoring along entire value chains.

Nonetheless, a CE may not be sustainable per se. While a global CE would, in principle, reduce virgin material extraction and waste, we must reflect on the impact of circularity on other resources (e.g., freshwater) and on environmental sinks (e.g., the atmosphere and oceans). What would be the net effect on greenhouse gas emissions? Would emissions effectively be reduced in a CE, even when products that once traveled across the globe travel again, at the end of their lifetime, in order to close the loop? Emissions must be considered in recycling, recovering, and other CE-related processes. Additionally, will CE reduce consumerism? To what extent could CE grow within “planetary boundaries”?¹ Finding answers to all these questions will depend on what is monitored.

Accordingly, the sustainable implementation of circularity principles will require effective monitoring of environmental and social (e.g. in relation to the quality and distribution of jobs) impacts across global supply (including reverse supply) chains. The issue of due diligence in global supply chains has increasingly taken front stage in some countries. Nevertheless, it still mainly relates to issues of human rights violations and other social standards. The ecological dimension has less of a focus, except when it spills over to aspects of human rights. Yet, the mounting scientific evidence of biodiversity loss, the acidification of oceans, and many other ecological pressures highlight the urgent need to address the ecological dimension with equal importance and urgency.

Transforming the linear economy into a CE requires a systemic approach that convenes industries and stakeholders with a view to exploring intersections between production processes and across value chains, in a way that allows for material and energy flows to be traceable. Ergo, the prospect of a CE could incentivize the monitoring of environmental impacts across global value chains in a more systematic way. All in all, the CE can be a major leverage point for addressing the challenge of mainstreaming social and environmental due diligence, as a key aspect for ensuring the fulfillment of a sustainable economic system. But, are we moving in that direction?

After the global financial crisis in 2008, the share of supply chain trade fell slightly and has stagnated since. The current situation, in the wake of the COVID-19 pandemic, has also brought about shifts and declines in the interconnectedness of global supply chains. However, it is too soon to speak of new trends in the integration of global value chains with any statistical rigor. It is thus worthwhile to look retrospectively at recent trends. The share of trade within supply chains in total world trade was just under 40% in 1980, but more than 50% in 2007. Then, following the advances in information and communication technologies, falling transportation costs, and the dismantling of trade barriers, there has been even more integration. From “2005 to 2017, the amount of cross-border bandwidth in use grew 148 times larger”.² This is a torrent of information traveling along digital pathways, some of which reflects companies interacting with

foreign operations, suppliers, and customers. Furthermore, Artificial Intelligence and the Internet of Things open new technological possibilities for a fine-grained integration of production lines that enable the trade of end-of-life products and raw materials. These are areas that need to be tackled to consider broader policy initiatives and to explore new types of business models. Above all, they are useful to identify opportunities to monitor social and ecological impacts. Until then, value chains remain linear and unsustainable.

In short, a sustainable circular economic system will unfold when both socio-environmental and economic benefits materialize. Socio-environmental assessments and monitoring may facilitate the identification of sustainable business models, by internalizing the ecological and social costs which are usually left out from economic calculations. This implies that a CE could further develop its potential as a driver of sustainability, by using its influence to include an effective monitoring of socio-environmental impacts.

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“The decision-making power is more on the side of the consumers than on the politicians. However, a concerted international policy to reduce carbon-intense means of transport and promoting others that emit less, through subsidies, would be a solution.”

-Frédéric MORAND

Image Source: Wikimedia Commons. March 27, 2020. HK Sheung Wan Queen's Road Central Fook Sing Court shop Fusion ParknShop Supermarket goods in March 2020. Photo Credit: Caomilm Mioat. https://commons.wikimedia.org/wiki/File:HK_上環_Sheung_Wan_皇后大道中_Queen%27s_Road_Central_福陞閣_Fook_Sing_Court_shop_Fusion_百佳超級市場_ParknShop_Supermarket_goods_March_2020_SS2_02.jpg



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On the future of furniture manufacturing

Martin Kochan (MK): SAINTLUC is a manufacturer of high-end furniture which implements the concept of circularity into its business model. What products does SAINTLUC produce and to what extent are your products circular, as of today?

Frédéric Morand (FM): The first furniture brand I created is the SAINTLUC brand. Saintluc is the result of an innovation in the world of composite materials: the substitution of glass and carbon fibers by the most ecological of all plant fibers: flax. Flax cultures do not require any fertilizer or water. The

culture and transformation mechanization need very little energy.

The composite material is constituted by the intimate union between the reinforcing fiber and a matrix, like resin or a thermoplastic material, which has the function to maintain the compatible fiber. The tightness of a composite material is due solely to the reinforcing fibers.

We continuously search for the best possible resin for environment and human well-being. There are different options: the classic resin from petroleum, a resin from biomass and a brand new resin from waste plastic bottles. We have opted for the latter.

MK: SAINTLUC is reusing PET bottles for its lounge chairs. Why have you chosen to use this kind of material?

FM: The question really arose between using a 100% petrol-based resin or a resin derived from biomass. The carbon balance of resin from biomass is excellent compared to that of 100% petroleum on the condition that the latter does not come from an intensive cultivation of maize which requires a lot of fertilizer, water and extreme mechanization for its culture. In addition, we questioned the relevance of using agricultural land, which is supposed to feed the planet and not to make luxury products intended for a very wealthy clientele.

We have concluded this debate because a new resin, of which

40% is made out of recycling of plastic bottles in PET, was offered to us. And if one day, luckily, there will be no more plastic bottles to recycle, we will just find another “good” solution!

MK: What makes it difficult for you, from a business perspective, to make your products even more sustainable and circular?

FM: Our clients are spread across the globe but our products are produced with French linen and manufactured in Europe. On the other hand, customers want the products to be shipped to where they live: Beijing, New York, Dubai or Sao Paulo. So maritime transport would be ideal to reduce the carbon footprint.

We also contemplated setting up production sites in other countries closer to our final customers. For example, in Asia, our product could then use jute fiber or abacca; in South America, we would work with banana fibers from Venezuela.

MK: How can policy makers make it easier for businesses to offer sustainable furniture at a competitive price?

FM: I believe that the decision-making power is more on the side of the consumers than on the politicians. However, a concerted international policy to reduce carbon-intense means of transport and promoting others that emit less, through subsidies, would be a solution. The world could stay

as interconnected as it is and globalization could continue! So why not a fleet of sailing cargo ships?!

MK: What will the furniture industry look like in 30 years from now? Do you expect the industry to focus on longer-lasting, more expensive products and move away from the cheap throw-away, IKEA culture?

FM: In the furniture sector, we do not face the horrors of fast fashion. We will increasingly move towards furniture that can be passed on from generation to generation, like our Saintluc products. And not just because it is expensive and the design market, like the art market, values “vintage”. But because the cultural influence and the taste for beauty, it seems to me, has become more universal and widespread. The Internet is also helping to popularize beauty. What is considered beautiful is timeless. An aesthetically pleasing armchair will still be beautiful after 50 years and no one will imagine throwing it away. I believe – and this is what we are going to do in 2022 with SAINTLUC – that furniture will increasingly get a ‘lifelong warranty’.

IKEA deserves credit for its minimalist transport design linked to consumer assembly. We work with our designers to succeed in integrating beauty, function and a reduction in the volume of transport of our products. In addition, direct sales from producer to consumer must develop further. We can maximize the added value of products by cutting out intermediaries and also reducing the flow of products.

A wide-angle photograph of a large industrial recycling facility. In the foreground, a curved conveyor belt system is visible. To the left, there are large stacks of yellowish-brown recycled material, possibly foam or fabric. In the center and right, there are various pieces of industrial machinery, including a large blue machine and an orange robotic arm. The facility has a high ceiling with large windows and industrial lighting.

“The latest IPCC report in 2022 has shown that we could still determine the future course of climate by lowering our greenhouse gas emissions, especially of CO₂. Applying Circular Economy (CE) practices to GVCs could potentially lead to a global carbon emissions cut of up to 39%.”

-Magdolna MOLNÁR

Image Source: A look at the recycling chain of RecyMatelas Europe, a medium-sized mattress recycling company, in Limay, Yvelines district, Paris region. Source of the photography: RecyMatelas Europe, <http://www.recyc-matelas.fr/>



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The only sustainable way forward: Circular global value chains

World economies are deeply interdependent via global production and service networks, which are expected to expand further due to digitalization. At least 70% of the total international trade currently involves Global Value Chains (GVCs), with goods, services, raw materials and product parts flowing across borders.¹ But supply disruptions of essential products and components such as semiconductor chips during the COVID-19 crisis have renewed the debate on the costs and benefits of globalization as well as encouraged some countries and companies to reconsider regionalizing their value chains.² The recent Russian-Ukrainian military conflict is expected to push this trend further. However, substantial reshoring does not seem to be a feasible long-term solution as GVCs can help dampen economic shocks and are economically more efficient than regional markets.³ GVCs have also created important economic opportunities for developing countries and emerging

markets, which no longer need to master entire production processes to participate in the global economy. The Global South has also benefited from foreign direct investments, and knowledge and technology transfers through GVCs.

Global Value Chains need more circular practices

GVCs have a significant environmental footprint as they need more packaging and shipping, leading to more waste and CO₂ emissions than trade in finished goods.⁴ Linear GVCs optimize efficiency at the product level but fail to provide an overall resource efficiency due to the 'take-make and dispose' principle they operate on. Environmental costs of GVCs are often externalized to developing countries, where environmental damages often result in economic losses. However, a recent study emphasized that anti-globalization should not be a strategy for long-term global emissions mitigation, as deeper GVC participation could reduce emission intensities as well as encourage international cooperation and the proliferation of sustainable technologies.⁵ For example, the production of green technologies such as solar panels could happen at lower costs through GVCs.

As a major part of global trade and services involve GVCs, making these transactions more sustainable would contribute considerably more towards national and international environmental goals. The latest IPCC report has shown that we could still determine the future course of

climate by lowering our greenhouse gas emissions, especially of CO₂.⁶ Applying Circular Economy (CE) practices to GVCs could lower their environmental impacts by reducing material consumption and waste production, potentially leading to a global carbon emissions cut of up to 39%.⁷ But despite decades of discussions about the benefits of CE, the global economy is still only 8.6% circular, meaning that only a small part of all minerals, fossil fuels, metals and biomass is reused.⁸

Circularity in GVCs faces some challenges

One reason for the low circularity in GVCs is that it needs radical changes in the current socio-economic system. Circular GVCs would go beyond the creation, marketing and use of a product, to reintegrate the consumed end-product into a new production process – by creating upstream linkages - that would involve repairing, reusing, recycling, and remanufacturing. This needs radical rethinking of how different actors are involved in the value chain and in turn, complex shifts in 1) company culture to focus more on long-term responsibility, and not just towards shareholders; 2) product design to extend the lifespan of products; 3) direct suppliers and sub-suppliers for more transparency of production processes and the contents of products or services, and 4) customer behavior such that there is active engagement in maintaining the value of products. CE strategies could help developing countries avoid development pathways with resource-intensive economic

practices, but the Global South has primarily been involved in supplying raw materials and cheap mass-produced goods. To maintain – and strengthen – their positions in emerging Circular GVCs, these countries would need to focus more on upcycling of materials, long-lasting and repairable goods, and providing services. Current GVCs have much economic activity in developing countries in sorting and recycling waste but higher-value opportunities for reuse and remanufacturing are yet to be explored.⁹ Only supportive international regulatory frameworks can steer progress towards more sustainable and inclusive Circular Global Value Chains.

The current stand of international due diligence regulations

Economic efficiency often leads stakeholders in GVCs to offshore their activities to countries with laxer environmental and human rights jurisdictions. Recent developments in mandatory national due diligence legislations in the Global North, particularly in Europe, have been important steps towards ensuring corporate compliance with human rights standards as these laws oblige companies to identify, prevent, and mitigate human rights abuses in their value chains. However, the current regulations focus on environmental standards only when environmental damage leads to human rights violations. To support the development of Circular GVCs, future due diligence legislations must also include corporate responsibility for sustainability standards such as ensuring toxin-free high-quality materials of

components and avoiding negative environmental externalities through waste reduction throughout the supply chain. The externalization of social and environmental costs will continue without any binding international due diligence legislation(s). Some voluntary guidelines have been proposed by international organizations, like the UN Guiding Principles on Business and Human Rights and Fashion Industry Charter for Climate Action, but a mandatory international framework has yet to be introduced. The ongoing German G7 Presidency is expected to provide new impetus to the discussion on international due diligence regulations as the agenda has prioritized the strengthening of international environmental and social standards in global supply chains.¹⁰

The first draft proposal of a European Due Diligence Directive, released on 23 February 2022 by the European Commission, aims to align the patchwork of voluntary and mandatory schemes within the European Union to avoid competitive disadvantages. This European legislation explicitly pushes for environmental standards in GVCs, with companies to be held liable for environmental harms committed at home or abroad by their subsidiaries, contractors, and suppliers. However, the scope of the draft has been criticized for being too narrow (i.e. applicable to less than 1% of EU companies), and companies could shift their responsibilities to suppliers by adding certain clauses to their contracts. Moreover, the proposal does not note any specific consequences for GVCs breaching the Paris Agreement and does not encourage circular practices.¹¹

The draft will be subject to amendments by the European Parliament and governments in the coming months. Clearly, much work lies ahead for European and international policymakers to establish a supportive regulatory environment for Circular Global Value Chains.

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“Closing the loop towards a global circular economy requires taking stock of the different capabilities in the Global North and the Global South to recover energy and materials, thereby addressing the challenges that deter worldwide circularity.”

-Alex GODOY-FAÚNDEZ, Jorge GÓMEZ-PAREDES



Image Source: Next to the new “Blok M” MRT station in Jakarta, the street economy and big city real estate live side by side as pandemic restrictions are gradually relaxed (March 2022). How the informal economy and large-scale infrastructure investments can benefit from each other is key to the long-term sustainable development of many cities in emerging markets and a defining feature of the development of the circular economy. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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Implementation gaps in the enforcement of transboundary extended producer responsibility

A well-established recycling supply chain and robust secondary markets, trading materials such as gold, silver, platinum, palladium, and copper, are key to circularize processes and advance towards a circular economy. These requirements and the necessary manufacturing capabilities are more commonly found in highly developed and industrialized economies. Hence, the Global North would seem more capable of embedding electronic products into a circular economic system. However, global trade means that products are exported to economies at different levels of industrialization and with different capabilities to manage end-of-life (EoL)

products. In most of the Global South, there is a lack of basic facilities to remanufacture, refurbish, repair, and recycle electronic products. Furthermore, the lack of effective collection systems, combined with market forces and trade barriers, hinder the possibility to send EoL electronic products back to manufacturers in the Global North. All these weaken the prospects of a global circular economy.

One way forward is to aid countries in the Global South to develop the necessary capabilities to manage electronic products and e-waste. Another is to enforce the Extended Producer Responsibility (EPR) principle. In fact, EPR is fundamental and an excellent approach to kick-start the circularization of economic processes. The problem is that the EPR principle falls into a structural trap in developing countries, which constraints efforts to bend the linear economy.

This is due to the fact that the EPR is limited by the transboundary movement of materials. An unrestricted compliance with the EPR principle will require manufacturers to take back EoL products from many different countries. Enabling this would involve encouraging consumers to return EoL goods, setting up effective collection systems, and establishing efficient and transparent mechanisms for the responsible transboundary movement of EoL products. In turn, these depend on the existence of secondary markets, which require coherent national policies.

In this light, compliance with the EPR principle will require producers of globally traded products to address three main challenges, which consequently are key areas of action to facilitate the global recovery of materials:

- Working with national and local policy-makers, regulators as well as activists to encourage and facilitate the return of EoL by consumers;
- Working with national and local governments to help establish the necessary facilities to collect and sort EoL products, and the essential secondary markets; and
- Working with national and international stakeholders to enable an effective, transparent, and responsible transboundary movement of EoL. For this, it is key to establish traceability mechanisms that allow for efficient reverse logistics.

Closing the loop to create a global circular economy and eliminating the mismanagement of e-waste, which brings about negative social and environmental impacts in many countries, requires taking stock of the different capabilities within the Global North and the Global South to recover energy and materials. Enforcing the EPR principle requires exporting producers to re-think their international value chains, and to work with local actors and stakeholders to address the challenges that deter progress towards worldwide circularity. Addressing these challenges is undoubtedly a sizable task, but if well executed the global benefits will be worth it.

Case Study:

WEEE Circular Innovation Hub, Nairobi, Kenya
<https://circularinnovationhub.com/>

Supporting entrepreneurs to develop new business models in response to Kenya's 2020 Extended Producer Responsibility regulations.
<https://www.kepro.co.ke/>

<http://www.environment.go.ke/wp-content/uploads/2020/05/4th-May-EXTENDED-PRODUCER-RESPONSIBILITY-REGULATIONS-2020-1.pdf>



“There will be a need to better distinguish between different recycled material streams for different applications. Today, (non-brominated) organic and inorganic flame retardants are mixed. Considering the (unknown) environmental impact that such mixtures have, which manufacturing process should use recycled plastics containing such mixtures including unknown reaction products that were formed during recycling?”

-Siddharth Prakash, Clara Löw

Image Source: Wikimedia Commons. June 21, 2018. Remains from a plastics processing machine at a recycling centre. Photo Credit: Ermell. https://commons.wikimedia.org/wiki/File:Kunststoff_Plastik_Rest_Abfall-20180621-RM-114314.jpg



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Dealing with future complex supply chains and products: Two hypotheses

There is consensus among various stakeholders in the private and the public sector that the transition to a circular economy can play a vital role when it comes to slowing environmental degradation, curbing resource consumption, contributing to climate protection and upholding biodiversity. We would like to discuss the current state of complex products and supply chains and how the circular economy can be embedded into them. The following two hypotheses can be looked at as an inventory of aspects that the Öko-Institut is working on.

Circular Business Models are effective, when they operate in short and well-known supply chains

Logistics and value chain management play an important role in the environmental impact of a product. Thus, for example, control of quality as well as compliance with supply chain agreements and standards is easier with fewer, well-known suppliers. The fewer suppliers, the better you can control them, which is especially important in large and volatile markets.

Let us give some examples from different a dimension. Currently, we are supporting several countries in Southeast Asia in their ambition to reduce single-use plastics, for example through design and a strong recycling market. The share of recycled plastic continues to be very low in packaging due to higher costs of recycled material, existing subsidies for virgin plastics and possible contaminants.

We repeatedly emphasize that measures such as recycled content targets can only be effective if applied in the context of the domestic recycling market. Ideally, increased demand for recycled plastic would trigger enhanced collecting and sorting practices in the domestic economy. But if the target is only being achieved through well-sorted imported plastics, the recycled content target isn't unfolding its potential and this transformation will not be achieved. Thus, there no solutions to the local littering problems.

In addition, transportation of goods and waste to and from consumers is often inefficient. Take the example of delivery services in the European context. Packaging material is widely distributed to customers and later collected again by waste collection services. Wouldn't it be most efficient if, for example, food delivery services use reusable packaging and take back food boxes and pizza packaging from yesterday's meal when driving by? Benefits would include the need for less transportation and less resource consumption. However, more collaboration and information exchange would be needed to implement such a system.

So, if we agree that Circular Business Models operate in short and well-known value chains, open questions arise in two areas. First, are we heading towards a broad logistics system that requires not only the transmission of goods but also of a bundle of information on compliance, trace substances, origin of materials including reverse logistics, which is much more extensive than today? Second, how do regional value chains work within existing globalization processes? Here, related questions arise. Do these regional value chains exist in parallel or do they need to be supported with policies against globalization processes? How would such policies relate to world trade regulations? What problems and opportunities would this bring? Is the solution for each country to make its own circular economy?

Handling increasing complexity of contamination of products in non-toxic material cycles – a Sisyphean task

We have observed two diametral trends:

HYPOTHESIS 1: On the one hand, increasingly complex products are brought to the market, containing various additional complex additives to fulfill very detailed functions in a very short time. The more products there are, the more complicated it becomes to separate the material cycles from one another. Today, innovations in the recycling sector are not that fast to keep up with new products and to disentangle the complexity effectively!

For example, the furnishing style of some people relies on old furniture, such as those from household clearance by family members. However, lacquers and paints of such furniture may contain heavy metals, such as lead, which was not prohibited in the past, but is today. Heavy metals in indoor air or dust can have serious health effects. Does that actually mean the end of life for old, lacquered furniture, and everyone would have to buy new closets and sideboards? That would not be in the spirit of the circular economy.

HYPOTHESIS 2: On the other hand, from a realistic perspective, circular economy measures must, in many cases, implicitly lead to a reduction in complexity in order to achieve the desired longevity, easy separability, reparability and better recyclability. This includes the phase-out of harmful

chemicals for recycled materials to be an attractive substitute of primary resources. For instance, we look at certain components in electrical and electronic equipment that contain flame retardants. Today, for higher effectiveness through an interplay of several flame retarding mechanisms, (non-brominated) organic and inorganic flame retardants are mixed.

Considering the (unknown) environmental impact that such mixtures have, which manufacturing process would use recycled plastics containing such mixtures including unknown reaction products that were formed during recycling? Potentially contaminated recycled material will therefore only be used in specific applications where certain pollutants and interfering substances do not matter. There will be a need to better distinguish between different recycled material streams for different applications.

How can we effectively steer the circularity trend, on the one hand, and manage the complexity of products and contamination of recycled materials, on the other hand?

Based on our current presumption, some sectors, such as packaging, will have to simplify and reduce material use very much. Harmful chemicals need a quick phase-out. And for other complex products – such as Information and Communications Technologies (ICT) and Electrical and Electronic Equipment – reuse, repair and recycling centers need to be well equipped with financial resources, manpower, time and

knowledge. Additionally, these services will need high appreciation and reputation within the society. The organization of all that is currently unclear and unassigned but not insurmountable.

Öko-Institut Case Study: Germany's Exit from Coal

<https://www.oeko.de/en/research-consultancy/issues/energy-and-climate-protection/germanys-exit-from-coal-managing-a-sustainable-transition>

Coal has historically been an affordable and reliable energy source across the globe. Many emerging economies were looking forward to tapping into coal to ensure low-energy prices while accelerating industrialization. The COP22 Paris Agreement on a global phase out of the use of coal has created an urgent need for innovation in both highly industrialized and emerging industrial economies.

Many Global South leaders are decrying the phasing out of coal as a deliberate attempt to dampen economic growth. However, an examination of Germany's lignite industry helps explain why coal power plants are financially unsustainable in the long-term.

Due to the low prices for electricity on the exchange, newer lignite-fired power plants can cover the operating costs of the power plant and the connected opencast mines, but no longer the capital costs of the investment. Larger maintenance or expansion investments in the supplying opencast mines are no longer worthwhile for older lignite-fired power plant blocks. As soon as fixed operating costs can be reduced to a greater extent in these opencast mines, closure is more economical than continued operation.

Hence, focusing on green industrial fuel technologies such as hydrogen is a better leapfrog approach for emerging markets. Green hydrogen can be produced from a number of waste sources making industrial energy transitions less dependent on the geographic distribution of coal deposits.



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Image Source: In the volcanic mountains near Atami, Shizuoka Prefecture, Japan (2019).
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3.3. Circular economy and the 2030 agenda in Latin America and the Caribbean

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Neha SIMLAI, IDH The Sustainable Trade Initiative, India

3.13. Commitment to global supply and value chains' transition to circularity

Holger KUHLE, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany

A group of people are seated in a room, likely at a conference or meeting. In the foreground, a woman with dark curly hair is speaking into a microphone. She is wearing a black jacket and a red skirt. To her right, another woman with brown hair is seen from the back, wearing a black and white floral patterned jacket. Other people are visible in the background, some looking towards the speaker. The text is overlaid on the left side of the image.

“The role of civil societies in trade negotiations (...) can help global supply chains become more circular (...), especially when it comes to FTA negotiations and the integration of complex issues like circular standards and climate mitigation targets.”

-Venkatachalam ANBUMOZHI

Image Source: Wikimedia Commons. June 23, 2015. The Bobs jury member Leila Nachawati, Spain © DW/N. Wojcik. Photo Credit: Deutsche Welle from Bonn, Berlin, Deutschland. [https://commons.wikimedia.org/wiki/File:Political_and_crisis_communication_capacities_for_civil_society_and_public_actors_\(18929244800\).jpg](https://commons.wikimedia.org/wiki/File:Political_and_crisis_communication_capacities_for_civil_society_and_public_actors_(18929244800).jpg)



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Free trade agreements and circular supply chains in the Asia-Pacific

The Asia-Pacific region plays a prominent role in the world's production, resource use and employment, through the formation of global supply chains. In part, this is the result of multilateral trade pacts, harmonized rules and technological innovation adoption. The main traded goods are from apparel and footwear, automotive, agro-food, electronics, and extractive industries. Global supply chain participation tends to be higher in the ten economies within the Association of Southeast Asian Nations (ASEAN) and in East Asia, which in 2019 accounted for more than 65 per cent of the Global Supply Chain (GSC) related intermediate imports in the world.

Widespread deforestation, polluted water resources, degraded agricultural lands and declining fish stocks are just examples of consequences of aggressively pursued economic growth by GSC that also generated millions of jobs across the region. On average, GSC related carbon

emissions account for 73 percent of a multinational company's total emissions. This underlines the imperative for circular supply chains that could tackle the negative externalities of free trade.

Many countries and businesses in the world have started adopting roadmaps for a transition towards more circular supply chains - a model that promotes enhanced resource efficiency, and the decoupling of economic growth from extractive, wasteful, and polluting processes. Moving from a linear, extractive produce-use-discard model to a more circular approach will involve a paradigm shift and significant changes to existing business models.

A wide range of trade in products and services plays a critical role in supporting the various circular business models underpinning GSCs. They include both traditional services, such as construction, repair and maintenance services, and new forms of products and production processes. The latter includes services related to sharing models involving co-ownership or co-access to information stored in digital platforms, or Product Service Systems, focusing on selling a service rather than the product itself. These circular services are not limited to domestic activities but are procured and supplied across borders. A recent study revealed that the current circular business approaches taken by MNCs could create new opportunities valued at USD 1.6 trillion.¹

ASEAN member states have affirmed their commitment to the transition to circular supply chains through the adoption of long-term frameworks for the circular economy. The framework identifies the key priorities of free trade, harmonization of standards, fostering innovation, sustainable financing, and enhanced resource efficiency. At the launch of this framework in November 2021, the ASEAN member states decided to work more closely to ensure synergy across the policy areas and at the same time to promote social inclusion.

While most of global thinking on the circular economy has focused on enabling policy frameworks at domestic level, much less attention has been paid so far to the role of free trade agreements (FTA) in supporting this transition. FTAs play an essential role in supporting circular businesses along GSCs, particularly in eco-design, the collection and sorting of waste material and its transformation into secondary raw material and remanufacturing or refurbishing. Technological advances, including artificial intelligence and Industry 4.0, are also to be paid due attention in future FTAs, given their functions as circular services. These have the potential to accelerate the global transition toward a more circular economy through comparative advantages and scale effects by closing resource loops and narrowing resource flows. With proper safeguards and regulations in place, FTAs can contribute to lowering tariff and non-tariff barriers to support clean technology diffusion.

However, when looking at bilateral and regional FTAs exclusively signed between ASEAN member states and their major trading partners like the US, the EU and Japan, there exists a huge gap between aspirations and implementation. For example, the recently concluded Regional Comprehensive Economic Partnership (RCEP) completely ignored the provision of environmental goods and services.

Which factors facilitate or hinder the integration of circular economy issues into bilateral or multilateral FTAs? In general, it has been argued that developing countries prefer setting up Multilateral Environmental Agreements (MEA) (Montreal Protocol, the Basel Convention and the Convention on International Trade in endangered species, the Paris Climate Agreement, etc.) to safeguard their stance on Common But Differentiated Responsibilities (CBDR). However, emerging trade disputes within the WTO have shown that a difficult relationship exists between free trade and trade related MEAs. Free traders often think that MEAs fosters green protectionism. But it is often very difficult to draw a distinct line between environmental protection and environmental protectionism because the preconditions for circular economy transition can easily be abused to justify trade restrictions, as in the case of the Chinese ban on imports of wastes in 2017.

Another reason for ASEAN member states' reluctance to discuss circular low-carbon economy issues in FTAs is that developing economies and their enterprises have neither the

capacity nor the capability to seriously address environmental issues prior to their per capita income being developed to a substantially higher level. However, this argument often forgets the fact that economic growth, resource depletion and social inclusion are interrelated and intertwined with the competitiveness of global supply chains. There also exists a lack of stakeholder interests in and understanding of the benefits of circular advantages. The North America Free Trade Agreement (NAFTA) is certainly the most prominent example, where public consultation led to the successful integration of sustainability issues into the trade policies of the US, Mexico, and Canada.

Advancing a global circular economy transition will require concerted action at the international level through FTAs, because in an integrated world economy, no individual country or company can achieve the transition on its own. But the integration of circular economy principles into global supply chains may be difficult when countries with different developmental stages are involved. Relevant institutional mechanisms, such as multilateral platforms for exchanging information, guidance, best practices, and experience-sharing on circular value chains are yet to be fully formulated.

The process of integrating circular aspects into trade agreements could be accelerated, if future FTAs bring along opportunities for green growth, geo-strategic importance on resource use or negotiations that serve as a testing ground

for a socially-inclusive development agenda in the future. This will make developing countries more willing to accept circular standards in bilateral FTAs as well as in mega trade agreements, such as RECEP. However, in order to realize the - often - aspirational goals of circular supply chains, participating countries should design more coordinated effort into policy fields covering environment, economy, innovation and finance.

The role of civil societies in trade negotiations is another important factor that can help GSCs become more circular. While most of the advanced economies have pluralistic societies in which interest groups are involved in policy making process, the participation of public and civil societies in the Global South is limited. This is especially true when it comes to FTA negotiations and the integration of complex issues like circular standards and climate mitigation targets. Thus, hardly any domestic pressure to integrate environmental issues in FTAs exists or is taken seriously by trade negotiators. Increased cooperation in science, technology and capacity building on best circular supply chain practices among trading partners will help developing countries, such as those among the ASEAN member states, to meet international obligations such as the Paris Climate Agreement, and will improve coherence between environmental policies and FTAs.

To sum up, transforming the current linear supply chains into circular ones on local, regional, and global levels, depends

on (1) the integration of trade and environmental policies, (2) the setting up of technological cooperative frameworks alongside trade agreements, and (3) on finding a new role for civil societies to constructively work together.

Notwithstanding that circular supply chains are mostly about business-to-business interaction, consumer participation is always necessary to raise awareness of various critical issues. It remains to be seen whether circular business models will be integrated in the world's mega FTAs, and whether bilateral trade agreements can help achieve better circular outcomes at the global level.

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“The SDGs should remain the guidepost for sustainable development; their bedrock principles of social inclusion, universal access to public services, and global cooperation are needed to address major challenges like COVID-19 and climate change.”

-Guillaume LAFORTUNE, Arunima MALIK



Image Source: Wikimedia Commons. February 28, 2012. Congresswoman Claudia Coari Mamani chairs a forum on Social Inclusion Policies in the Raúl Porras Barrenechea room. Photo Credit: Congreso de la República del Perú from Lima, Perú. [https://commons.wikimedia.org/wiki/File:Foro_sobre_pol%C3%ADticas_de_inclusi%C3%B3n_social_\(6856880796\).jpg](https://commons.wikimedia.org/wiki/File:Foro_sobre_pol%C3%ADticas_de_inclusi%C3%B3n_social_(6856880796).jpg)



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How to strengthen the EU's SDG leadership?

The SDGs represent European values. The EU, its institutions and Member States played a key role in the adoption of the 2030 Agenda, the SDGs, and the Paris Climate Agreement in 2015.¹ Article 11 of the Treaty on the Functioning of the European Union stipulates that “Environmental protection requirements must be integrated into the definition and implementation of the Union’s policies and activities, in particular with a view to promoting sustainable development”.² Some therefore see the SDGs as a “European Agenda” that the whole world has signed onto.³ In 2019, Europe became the

first continent to commit to achieving climate neutrality by mid-century, via the European Green Deal. The SDGs representing European values might explain the strong performance of the EU and individual Member States on the SDG Index.

The world needs strong leadership from the EU to restore and accelerate SDG progress globally. The COVID-19 pandemic is a setback for sustainable development globally. It has exposed the major weaknesses of the multilateral system and the glaring insufficiency of international development finance. Achieving the SDGs is fundamentally an investment agenda, yet the poorest half of the world lacks market access to capital on acceptable terms. Some argue that the world should scale-back SDG ambitions.⁴ In our view, the SDGs should remain the guidepost for sustainable development.⁵ Their bedrock principles of social inclusion, universal access to public services, and global cooperation are needed - more than ever - to fight COVID-19 and address other major challenges of our times, including climate change. In 2023, the UN will host, under the auspices of the General Assembly, the SDG Summit at the Heads of States level. Halfway through the SDGs, the EU can and should play a central role in catalyzing global efforts and commitments for the SDGs.

To ensure international legitimacy, the EU must address negative international spillovers, including those embodied in unsustainable supply chains. The EU generates negative international spillovers which undermine other countries’

ability to achieve their SDGs.⁶ Approximately 40% of the EU's CO2 footprint to satisfy its goods and services consumption occurs in other countries.⁷ EU's consumption is responsible for 16% of tropical deforestation;⁸ its imports of textile products are associated with 375 fatal- and 21,000 non-fatal accidents at work,⁹ and its food demand contributes to 16% of the particulate matter emissions outside the EU.¹⁰ Deglobalization and trade wars are not viable options as these would lead to a significant drop in living standards in the EU and globally.¹¹

We underline four major priorities to address the EU's international spillovers ahead of the 2023 UN SDG Summit.

International financing: The EU should push for major reforms of the international development finance system to support the SDGs and the Paris Agreement. As emphasized by the UN Secretary-General,¹² this should include a reform of the flawed credit rating system which does not give poorer countries access to capital markets to finance key SDG Transformations.¹³ Rich countries also bear a special responsibility when it comes to climate change and safeguarding the Global Commons; yet, they fell short in delivering on their commitment to mobilize USD 100 billion each year by 2020 to help poorer countries adapt to climate change and mitigate further increases in temperature. Some announcements made at COP26 go in the right direction, including the US and EU pledge to slash methane and the € 1 billion EU pledge to protect the world's forests.

SDG/Green Deal Diplomacy: EU leadership and diplomacy will be critical to advancing key multilateral processes towards achieving the SDGs at the UN General Assembly, the High-Level Political Forum on the SDGs, the G7 (under German Presidency in 2022), the G20 (under Indonesian Presidency in 2022), and the Annual Meetings of the IMF and the World Bank. Technical cooperation and knowledge transfer can support greater sustainability in producing countries. SDG/Green Deal Diplomacy can help achieve sustainable development worldwide and advance the EU's geopolitical interests.

Due diligence and other domestic measures: Businesses operating in the EU should be held accountable for the impacts they generate throughout their value chains. The forthcoming EU Due Diligence Act may help increase accountability and business reporting. Yet, the experiences of individual Member States, including France, suggest that such regulations will need strong enforcement and monitoring mechanisms. If well designed, measures like the proposed Carbon Border Adjustment Mechanism may help increase policy coherence, but they may also be seen as protectionist since they will inevitably impact trade partners, including poorer countries which are not responsible historically for climate change.¹⁴ The EU should also curb trade in waste and toxic pesticides.

Accountability, data, and statistics: Robust data systems are needed at the international, national, industry, and corporation level to track negative impacts throughout the supply chain, and to inform global action on addressing spillovers. The EU has already taken major steps in this direction, including via the work of the Joint-Research Centre,¹⁵ Eurostat¹⁶ and the European Environmental Agency.¹⁷ Over time, consumption-based metrics should become a part of official statistics. Finally, should the EU decide to submit a Union-wide Voluntary National Review, it should include a section on the EU's efforts and monitoring system to curb international spillovers.

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“If circular economy were to become a key sector in the ECLAC’s economies, this sector could contribute to a greener economy and generate almost 450,000 stable jobs. It would also increase the region’s GDP by 0.35%.”

- José Luis Samaniego LEYVA, Carlos de MIGUEL

Image Source: The sale of spare parts for all sectors of the economy is a visible part of the industry on the street in many countries in Latin and South America, and a link between global industries and daily urban life, as well as neighborhoods specialized in certain products. Addressing this economic urban geography to develop the circular economy should be accompanied by a more global approach to supply chains. Here, a store selling cables for the automotive industry in Mexico City, February 2020. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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Circular economy and the 2030 agenda in Latin America and the Caribbean

Latin America and the Caribbean (LAC) was strongly impacted by the global COVID-19 pandemic in 2020 and 2021: its GDP decreased by 6,8%, poverty reverted to its levels from 12 years ago and that from 20 years for those in extreme poverty (ECLAC, 2021c). It has now become essential, in a more restrictive fiscal context and in an environment of rising interest rates, to promote the development of sectors that contribute to public revenue without aggravating the external constraint; all that while reducing the environmen-

tal footprint (ECLAC, 2021b, 2020). Circular economy (CE) responds to this profile, and even with limitations, it is able to accelerate the way out of the recession and make better use of the materials which are currently wasted. It also creates jobs and renders other social, environmental and economic co-benefits.

Advancing circularity implies applying cross-cutting policies and also specific industrial policy for each sector. Extended producer responsibility (EPR) laws, for example, have encouraged greater reuse by type of waste and are generating industries capable of recovering waste, such as glass, cardboard, and plastic (Samaniego et al., 2021). In the region, the percentage of reuse or recycling of materials is still very low, and this generates high costs for local governments. In LAC, most water bodies are polluted and increasingly the coasts and seas are turning into waste dumps. The problem is growing and far from being controlled. Little has been achieved, for example, at the design stage for circularity, as it takes place mostly outside the region. Little progress has been made in harmonizing design processes to avoid waste. Without a shift in relative profitability in favor of circularity approaches, their promotion will not go beyond a marginal improvement in waste management.

Of the more than 200 million tons of waste generated annually, less than 5% is estimated to be recycled, compared to 20% in OECD countries. Furthermore, this only applies

to waste such as paper and cardboard, scrap metal, some plastics and glass. Hence, CE is an opportunity to develop local production chains.

In the region, there are different levels of progress in terms of circular strategies. Some countries have included CE in their NDCs to achieve the goals of the Paris Agreement. Others, such as Ecuador and Peru, have developed or are planning circular economy roadmaps. Brazil, Colombia, Chile, Costa Rica, Honduras, Mexico, Peru and Uruguay are in the process of implementing EPR laws, including for electrical and electronic waste, batteries and tires, among others.

The high employment multipliers as well as direct and indirect effects on the GDP lead to the conclusion that, if CE were to become a key sector in the region's economies and if municipal waste recycling rates were equivalent to those in Germany, this sector could contribute to a greener economy. It would also generate almost 450,000 stable jobs and increase the region's GDP by 0.35%. The results for four countries analyzed in detail by ECLAC (Colombia, Mexico, Peru and Chile) are similar: CO₂ emissions from combustion would decrease, and even more net jobs could be created.

Together with the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) as well as the European Commission through the Euroclima+ program, ECLAC has

simulated the economic, social, and environmental impacts of circular economy, the relationships between international trade and circularity, as well as some aspects of circular bioeconomy. Its key purpose is to document and inform a positive narrative based on the idea of a big sustainability push by estimating the possible positive contribution to the 2030 Agenda. It aims at a transition towards sustainable development and analyzes the potential of regulatory and economic instruments to accomplish this transition.

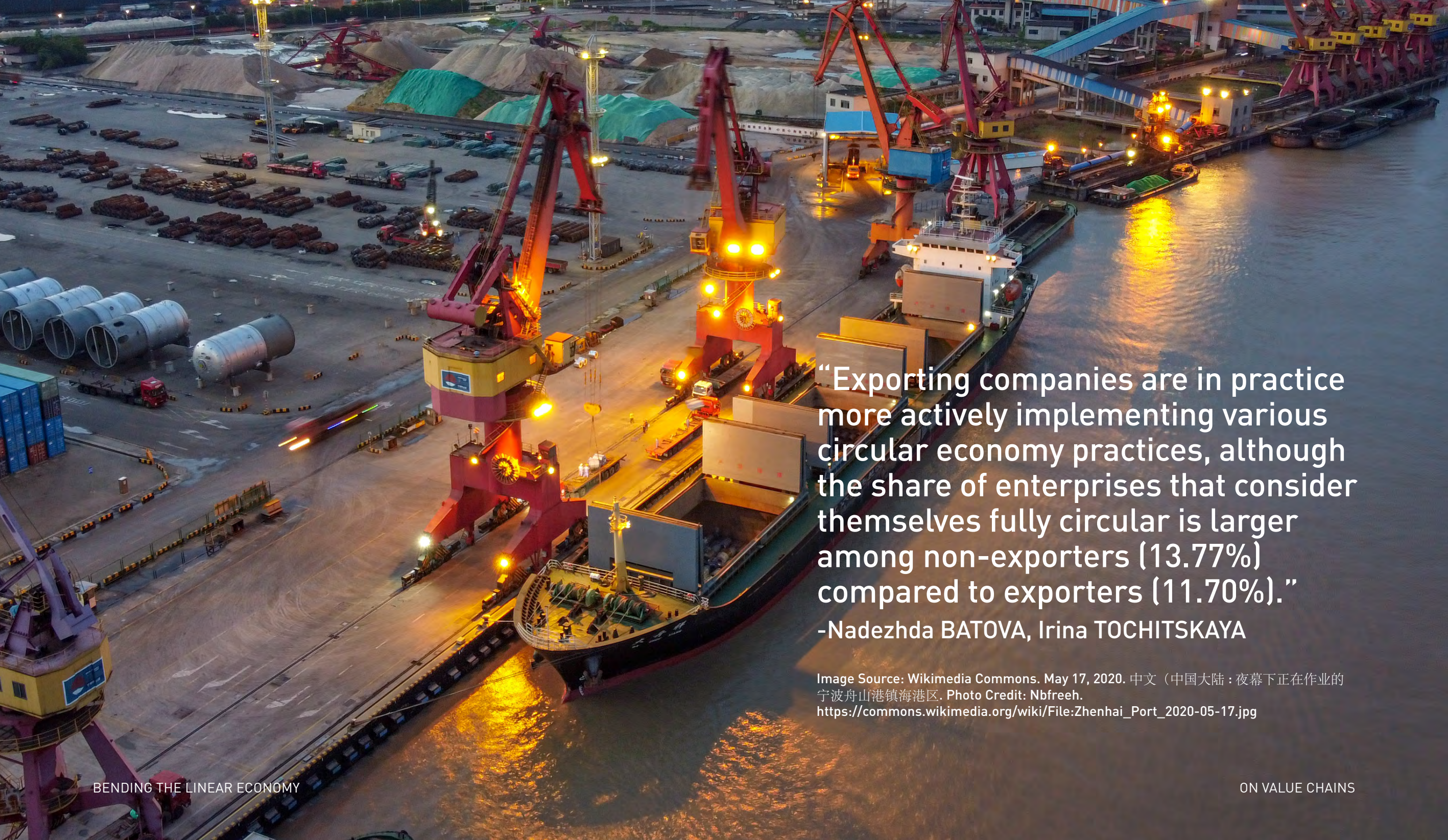
Incorporating carbon valuation mechanisms for changing relative returns in favor of lower carbon development

<https://euroclimaplus.org/en/lao2/incorporating-carbon-valuation-mechanisms-for-changing-relative-returns-in-favor-of-lower-carbon-development>

Participating Countries: Chile, Colombia, Costa Rica, Guatemala, Honduras, México, Nicaragua, Panamá, Perú.

Goal: This initiative aims to create incentives to promote changes in the profitability of public investment projects and changes in production and consumption patterns, so that Latin American countries move towards a more sustainable and low-carbon development.

Training: Strengthening the technical capacities of national public investment system teams on developing mechanisms to assess the social price of carbon.

An aerial night photograph of a bustling port. Several large red gantry cranes are positioned along a quay, loading a large cargo ship. The cranes' lights are on, casting a warm glow on the water and the ship's deck. The ship's cargo holds are open, and some containers are visible. In the background, there are large piles of sand or gravel covered with green tarps, and other port infrastructure. The water reflects the lights from the cranes and the ship.

“Exporting companies are in practice more actively implementing various circular economy practices, although the share of enterprises that consider themselves fully circular is larger among non-exporters (13.77%) compared to exporters (11.70%).”

-Nadezhda BATOVA, Irina TOCHITSKAYA

Image Source: Wikimedia Commons. May 17, 2020. 中文（中国大陆：夜幕下正在作业的宁波舟山港镇海港区. Photo Credit: Nbfreeh.
https://commons.wikimedia.org/wiki/File:Zhenhai_Port_2020-05-17.jpg



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challenges for which traditional solutions do not work anymore. Despite the circular economy making headway in the policy agenda of many countries, there is still a long way to go for its practical implementation in different businesses.

International trade, which is increasingly dominated by the fragmentation of production activities among networks that spread across different countries, may play an important role in accelerating the transition towards a circular economy. On the one hand, synergistically working in the same direction through the Global Value Chains (GVC) allows for a diffusion of circular economy practices throughout different production processes. On the other hand, a growing number of governments are introducing circular economy-related policy measures, such as regulations related to, among others, reuse and repair of products, recycling, setting standards for biodegradable packaging. These affect production processes and product design. As a result, this may (positively) disrupt the operations of companies that are engaged in international trade and participate in GVCs by pushing them to adopt a circular economy model.

But how do the exporting companies and their domestic counterparts perform in relation to the implementation of various elements of the circular economy in their business practices? Data from a survey on the transition to the circular economy conducted in Belarus in 2020-2021 by the Belarusian Economic Research and Outreach Center (BEROC) reveals that while the share of enterprises that consider

Let's become circular: Exporters vs. non-exporters in Belarus

The transition towards the circular economy (CE) has been gaining momentum recently as a response to environmental

themselves fully circular is larger among non-exporters (13.77%) than exporters (11.70%), it is exporting companies that are more actively implementing various circular economy practices. The survey included 403 respondents, notably enterprises across different industries, with 34.2% of them being totally domestic-oriented companies, while 65.8% were exporters.

According to the survey, 71.76% of exporting and 58.82% of non-exporting enterprises are engaged in the trade of waste and secondary raw materials through recycling, refurbishment and remanufacturing activities. One of the main reasons for that is the legislative requirements in Belarus that forbid the disposal of secondary raw materials into landfills. The use of secondary raw materials for the production of goods is adopted by 49.4% of exporters and 42.8% of non-exporters. Exporters perform better than non-exporters in terms of recycling end-of-life products into new goods or raw materials (30.4% and 23.0% respectively), as well as in extending products' life (32.0% and 29.6% respectively).

Undoubtedly, implementing circular economy practices, such as using secondary raw materials in the production and recycling of end-of-life products into new goods or raw materials, may require substantial upfront investments in new equipment or adjustments of technological processes. In this regard, exporting enterprises, whose larger sales base allows them to better amortize the fixed costs of new technologies or equipment, are better positioned to implement

these upgrades. Moreover, exporters well positioned in the global value chains may have better access to CE technological know-how or may experience more pressure from other segments of the value chains, acting as a driver to become more circular.

With respect to more advanced business models, such as product-as-a-service or sharing production facilities, databases, services, etc., with other enterprises, the survey revealed, that the performance of both exporters and non-exporters was not quite advanced. This suggests that enterprises in Belarus focus mostly on circularity of product and production processes instead of innovative CE service schemes. Nevertheless, 75% of exporters fully or partly acknowledged that innovation is accelerating the transition to a circular business model, which, taking into account global trends, is gradually becoming a necessary condition for access into foreign markets.

Despite the increased interest in CE among Belarussian enterprises, the implementation of circular business practices has been hampered by economic, technological, regulatory, information, and cultural barriers. Yet, exporters are much more aware of the existing barriers against their circular transformation (84.9%) compared to non-exporters (71.7%). The survey also revealed differences in the prioritization of the limiting factors in this transition. The lack of state support and tax stimulus were prioritized by exporters, while non-exporters considered the lack of funding as the limiting

factor in their circular transformation. Both groups noted that a shift from a linear economy is hampered by technical and knowledge barriers, such as the lack of available technologies (60.54% of exporters, 63.16% of non-exporters) as well as the lack of information and best practice examples with regard to circular economy implementation (51.79% of exporters, 53.68% of non-exporters). As exporters are better integrated into international trade and global value chains, they nevertheless enjoy more opportunities to overcome these barriers successfully.

To conclude, the extent of an enterprise's integration into international trade and global value chains can affect progress towards the transition to the circular economy. Exporting companies are more actively implementing various circular economy practices than non-exporters and are therefore better positioned to address barriers in their CE transformation.

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“The circular economy concept emphasizes the need to use raw and mainly used materials in a closed loop that includes both consumption and production. Such a loop can be closed within the framework of eco-industrial structures.”

-Elena Yu. DOROKHINA, Sergey G. KHARCHENKO

Image Source: Wikimedia Commons. November 23, 2017. The scrap metal junkyard of Steenhuis Recycling B.V. Photo Credit: Donald Trung. [https://commons.wikimedia.org/wiki/File:Scrap_metal_junk_yard,_Winschoten_\(2017\)_03.jpg](https://commons.wikimedia.org/wiki/File:Scrap_metal_junk_yard,_Winschoten_(2017)_03.jpg)



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Transition to a circular economy in the Russian Federation

A 10-billion rubles (150-million euros) federal project aiming to facilitate the transition of the Russian economy to a circular model will be launched in Russia in 2022. The aim is to achieve 100% sorting of municipal solid waste volume and reducing the volume of waste sent to landfills by 50%¹ by 2030. Six areas of intervention are foreseen, notably reduction of waste generation, creation of infrastructure for the collection of waste for recycling, stimulation of the secondary resource exploitation, limiting the use of non-environmentally friendly packaging, creation of a traceability

system for the movement of waste, and improving environmental education. The circular economy concept emphasizes the need to use raw and used materials in a closed loop that includes both consumption and production. To this end, such a loop can be closed within the framework of eco-industrial structures (i.e., parks, chains, etc.). The basis of this closed-loop economy is a consciously organized and regulated circulation of raw materials, products and waste, acting as the main force for reducing the expansion of landfills and dumps in Russia. The aim is to achieve the use of 40% of secondary resources in construction, 50% in agriculture and 34% in industry by 2030, where the targets are comparable to those set in countries like Germany (68% of waste involved in the secondary circulation), and Sweden (49%).¹

According to 2020 data, 6.5 billion tons of waste comes from subsoil use in Russia. To maximize the use of natural raw materials with minimal environmental impact, the following steps are considered: creation of drainless technological systems based on newly introduced and promising methods for water purification systems from dissolved and suspended waste; development and implementation of recycling systems; creation of new technological processes for the production of traditional types of products with reduced waste generation; creation of closed eco-industrial structures of raw material, product and waste flows.²

Waste stream analysis show that electronic waste is one of the fastest growing and, therefore, problematic types

of waste (3-4% annual increase). The main reason for this increase is the obsolescence of old equipment and the emergence of new, more advanced and prestigious household appliances and electronics. To this end, and according to Chinese experts, the extraction of gold, silver, palladium and platinum from existing devices is 13 times more efficient compared to mining.

In Russia, product life cycle monitoring has been carried out by the federal state information system since 2022. A digital platform was developed by the state corporation Rosatom within the federal project “Infrastructure for waste management of I-II hazard classes” for the national project on ecology. The platform will allow record keeping and control over the entire life cycle of such waste - from generation to disposal or recycling. This platform links together almost 50,000 actors, notably, waste generators from various industries, transport companies, waste recycling enterprises and all interested federal executive authorities (Ministry of Natural Resources, Rosprirodnadzor, FAS, Ministry of Transport).

This federal project also involves the creation of seven eco-industrial parks - special production and technical complexes aimed at recycling industrial waste and transforming them into secondary products. These enterprises will produce metal hydroxides, salts, chlorides and sulfates. For example, an eco-industrial park will be established in the Kurgan region on the site of the former Shchuchye chemical waste disposal facility. Water and gas supply systems, the

analytical laboratory, and parts of the buildings from the old enterprise will be used in this new complex. The work of the enterprise involves closed technological cycles and maximum observance of the waste-free production principle.

The Neva ultra-modern Municipal Solid Waste (MSW) recycling complex has been operating in Solnechnogorsk (Moscow Region) since 2022. Sorting and transportation of MSW for recycling are carried out automatically. An important mission of this project is the elimination of an old garbage dump located next to the enterprise.

An eco-industrial park near the village of Nikolskoye, in the Lipetsk Region, has also been planned for. Household waste from residents of Lipetsk and the Lipetsk Region is currently disposed of at the Tsentrolit landfill, which has reached its capacity. This landfill is the cause of numerous appeals and complaints from residents of neighboring houses. The landfill is to be gradually decommissioned and reclaimed in the coming years. The new eco-industrial facility will make it possible to not only to dispose of waste, but also to recycle it. In addition, modern technologies will be applied in the construction and operation of the eco-industrial park. For instance, the isolation of the landfill body with a geomembrane; a system of leachate collecting and cleaning; and briquetting in a film. All these measures will eliminate the negative impact on the environment and public health.

Another project under construction is a polymer recycling plant, which will be put into operation near Yegoryevsk, Moscow Region, by December 2022. It will become the largest polymer recycling plant in Russia. Its production facilities will allow recycling of up to 60 thousand tons of plastic waste per year. The plant's products - flakes and granules obtained from plastic recycling - will serve as raw materials for the production of food-grade plastic, film, automotive components and building materials. The enterprise will also provide 212 new jobs for the residents of the region.

Environmental education is one of the directions taken by the "Circular Economy" federal project. For example, a joint project has been designed between the Plekhanov Russian University of Economics and the public law company Russian Environmental Operator (REO) on the development and implementation of educational programs for undergraduate and graduate students in Circular Economy (2021).³ REO was established through a Presidential Decree on January 14, 2019. Its key task is to form an integrated MSW management system in Russia. The company not only made a significant contribution to the development of educational programs, it also created a basis through which students will be able to undergo internships, gain practical skills in the field of MSW management, among others. The joint project will allow the training a cohort of specialists whose knowledge and skills will contribute to the transition to a circular economy in Russia. Students will also study green finance, public administration and state support in the field of waste management,

tariff regulation for the removal of MSW, etc. In addition, investors and industrial partners of REO will be able to make requests for the Situation Centre to develop projects in the field of the circular economy. The university will develop information platforms to control waste management in the field of housing and communal services.

In general, the transition to a circular economy is possible only through the combined efforts of businesses, the public and all levels of government. It is also important to expand public education to encourage responsible behavior of consumers in terms of waste separation and reduction of the use of single-use packaging (e.g., in cafeterias and shops). In addition, it is necessary to offer sustainable packaging alternatives, reusable bags with attractive designs and biodegradable bags, among others.

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“Unfortunately, environmental considerations are not prioritized enough at governmental level in our country. Industrial stakeholders such as those from the packaging industry have little or no interest at all to (re)introduce reuse systems. Their lobbying power is significant, and the public demand is not strong enough to force change.”

-György SZABÓ

Image Source: A landfill waste deposit near Budapest in Hungary. Photo Credit: <https://fr.depositphotos.com/stock-photos/hungary-waste.html?view=242952578>. Rights by Nicolas J.A. Buchoud.



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Waste reduction efforts in Hungary from an NGO perspective

Magdolna Molnár (MM): Hungary, unlike many other EU member states, has not met the EU's ambitious waste management goals which stipulates that 55% of municipal and 65% of packaging waste must be prepared for re-use or recycling by 2025. Why do you think Hungary has not been able to meet the minimum waste management targets?

György Szabó (GS): Hungary had met its previous targets up to 2011 with the exception to glass waste that could not be met without a deposit return scheme. Despite public support

for a deposit system, as confirmed by several opinion polls, the government did not introduce the scheme. Nevertheless, strong hope remained that we would continue meeting at least the other targets for municipal and packaging waste. However, from 2012, the new government completely changed the waste collection system and financing tools; they decided to centralize waste management, which became completely bureaucratic, under-funded and cumbersome. The responsibility was taken out of the hands of local municipalities. Thus, collection became irregular, the tasks and responsibilities are not clear and waste management plans do not exist or are delayed.

The insufficient number of waste collection and treatment sites, the lack of re-use centers and repair shops as well as the lack of data on waste management are also problematic. As mentioned before, Hungary would desperately need a well-functioning deposit return system since the number of refillable bottles is decreasing. The establishment of an Environmental Ministry would also be essential to redirect adequate focus as well as enhance political will and accountability. Currently, there are no incentives for waste managers to make their operations more efficient - responsibility and profits are taken out of their hands. It is clear that the centralized waste management system does not work. At the same time, there are also no incentives for residents as we do not have a 'pay as you throw (PAYT) system'; there are also only a few governmental efforts for raising public awareness. The extension of separate waste collection to

more categories (e.g. hazardous waste, textile waste, bio-waste) would also be extremely important.

MM: One of your current campaigns is to promote Deposit Refund Systems. In many other European countries, it has become a common practice, for instance the “Pfandsystem” in Germany. Why did the Deposit Refund System almost completely cease to exist in Hungary?

GS: Unfortunately, environmental considerations are not prioritized at the governmental level. Industrial stakeholders (e.g. packaging industry, plastic manufacturers, big brands like Coca-Cola) have little or no interest at all to (re)introduce reuse systems, and their lobbying power is significant. Also, these deposit systems are complicated, thus, retailers are opposing them. Unfortunately, there is no real political will behind it, and the public demand is not significant enough to force change.

MM: How could the country reintroduce a refund system?

GS: For this to happen, the will of policy makers is needed, as well as the involvement of different stakeholders. At Humusz, we have already approached the responsible ministries and the largest retailers, and plan to get in touch with producers next. It would be important to start planning together and to use the best practices of effective deposit return systems of other countries in Europe (e.g. Germany, Netherlands, Finland, Denmark). We think that a collection

target for all beverages would quickly deliver strong results. As many studies show (e.g. TOMRA or Reloop), the deposit system should be easy, accessible and fair for all users, with producers financing and investing in the system using commodity revenues and an eco-modulated EPR fee. System integrity and appropriate checks and balances are also important.

We propose the standardization of refillable beverage bottles (including caps and labels), which will facilitate the expansion of refill schemes. Regionally operating cleaning centers are also essential. Clear labeling should be used to help consumers to be properly informed and make responsible choices when buying products. Packaging should clearly and prominently indicate whether it is refillable or not and include the appropriate disposal method for single-use packaging.

Humusz Waste Prevention Alliance: Circular Citizen Action
<https://zerowasteeurope.eu/member/humusz-waste-prevention-alliance/>

Our Alliance works to create the will, to disseminate the knowledge required and to develop the societal, economic and environmental framework of conditions needed.

Humusz considers civil communities, teachers and students, municipalities attending higher education to be our outstanding allies. We provide the tools required to go zero waste, including the provision of information, education and consulting, the research for good practices, developing and establishing waste prevention examples and good practices, and the stimulation of community co-operations.



“Food loss and food waste constitute a major constraint to achieving the sustainable development goals (SDGs) in Ghana.”

-Emmanuel K. BOON, Samuel ANUGA

Image Source: The mix of formal and informal economy which is typical of many middle and lower-income countries is a critical dimension of sustainable transformations, with food production one among many sectors of daily life which are impacted by urbanization. Here, food packing waste near a supermarket in the outskirts of Johannesburg in South-Africa. Image by Nicolas J.A. Buchoud, all rights reserved ©.



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Food losses and waste management in Ghana: Can the circular economy offer solutions to these problems?

Agriculture is a mainstay of most Sub-Saharan African (SSA) countries like Ghana. The sector contributes significantly to Gross Domestic Product (GDP) growth, employment creation, poverty reduction, food provision and generation of foreign exchange to finance development programs and projects. More than 65 per cent of Ghana's land area is used for agriculture, and this accounts for 19.6 per cent of GDP and 13 per cent of total export earnings.¹ The complex inter-relations amongst agriculture, food supply chains (FSC), demography and climate

change are great concerns in Ghana. The rapidly increasing population implies an increase in the demand for food. However, food production and FSC are heavily constrained by significant inefficiencies such as food loss and waste.²

Food loss and food waste (FLW) generally refer to total losses and waste within the various stages of FSC, starting from growing, harvesting, packing, processing, transporting, marketing, and distribution, to final consumption.³ Nearly 17% of all food produced for human consumption in the world is wasted or lost along the FSC, corresponding to about 931 million tons in 2019.⁴ In a developing country like Ghana, FLW occurs mainly at the production stage due to technological reasons, such as poor harvesting procedures and poor storage conditions, as well as inefficient transportation and logistics. FLW in Ghana is estimated to be well below 40 to 50% but these numbers are still significant. FLW is estimated to amount to about 4 billion USD per year or about 15% of the total value of grain output (27 billion USD) in the country.⁵ As a result, FLW constitutes a major constraint in achieving the Sustainable Development Goals (SDGs) in Ghana.

To effectively improve both FLW performance and resource efficiency, the deployment of a circular economy (CE) model in the agriculture value chain is imperative. Inculcating the principles of reducing, reusing, refusing, rethinking, repairing and recycling agricultural resources in this value chain will enable the reduction in non-renewable resource use and waste production throughout the life cycle of agro-products.

This can be achieved by connecting farmers, marketers and manufacturers with consumers. Every modern-day farmer in a developing economy needs to share success stories and encourage young people to take up farming as a lifelong occupation. This can only be achieved by closing the agriculture value chain loops and increasing yields and profitability.

In summary, the circular economy model can help Ghana to significantly reduce inefficiencies in the agricultural sector and deliver positive economic, social and environmental benefits to the population. If Ghana achieves a 50% food loss reduction by 2025, it would result in a fall in unit costs of production for all food groups and an increase in production, sales, revenues and GDP.⁶ Achieving this reduction requires putting policy-makers at the center of the transformation process. Designing and enforcing a legislative framework that promotes the deployment of the CE model in agriculture, initiated by the Ministry of Food and Agriculture (MoFA) of Ghana, could serve as a promising starting point. Also, private sector entities, including food processing and packaging companies, civil society organizations and research institutions need to design food products that guarantee low environmental impacts and high resource efficiency. Efforts by the Zoomlion Waste Management Company and the Biotechnology and Nuclear Agriculture Research Institute to prioritize agriculture value chain improvements through composting of household and market waste are steps in the right direction to address FLW in Ghana. More of such actions across the country could result in a significant transformation of the agriculture value

chain. Finally, achieving circularity in the agriculture value chain should be an inclusive process, addressing and considering every single individual. Substantial effort should be made to change the general public's consumption patterns. For instance, people should be encouraged to only buy what is needed, ensure appropriate storage of food, eat smaller portions, repurpose leftovers, respect food and support local food producers. If people shop, cook and eat smarter, especially in a country where food waste predominantly occurs within households, during social gatherings and at parties, agricultural resource efficiency and improvement of agricultural value chains can be achieved.

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“Yokohama’s ‘Circular Economy Plus’ goal considers people the primary part of the circular economy because they actively tackle local issues. As of February 2022, there are fourteen Living Labs and two associations, which are open societies where people from different backgrounds, such as local citizens, companies, governments, and educational institutions, can work on regional issues.”

-Rina MUROI

Image Source: Circular Yokohama. Aquaponics, circular organic agriculture. Photo
Credit: <https://circular.yokohama/en/2021/09/28/new-project-added-aquaponics/>



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Circular economy plus drives sustainable city development in Yokohama, Japan

Why a Circular Economy in Yokohama? Yokohama, reached by a 30 minutes drive south of Tokyo, is the second-largest city in Japan, with a population of over 3.7 million. Since its opening in 1859, Yokohama has thrived as one of Japan's leading port cities, and is now an innovation hub to where many gather to develop new businesses and participate in R&D. Yokohama has a vibe of an open mind, having many international exchanges and actively adopting new cultures. The citizens love the city and have civic pride - a diverse and creative community that values sightseeing, art, and culture has created the uniqueness of Yokohama today.

The Japanese government recognized Yokohama's advanced efforts to achieve sustainable development and selected it as an "SDGs Future City" in 2018. Yokohama aims for decarbonization by 2030 and is developing a variety of projects to meet each goal of the SDGs. The circular economy is a

comprehensive vision that manifests at the intersection of these efforts. It also achieves social justice while eliminating environmental impact, and enables a thriving city.

In 2021, the city of Yokohama set the unique goal "Circular Economy plus" under the agreement with three initiatives that encourage Yokohama's sustainable development. "Circular Economy plus" considers people the primary part of the circular economy. It has initiated "living labs", which are open societies where people from different backgrounds, such as local citizens, companies, governments, and educational institutions, can work on regional issues. Fourteen living labs and two associations are actively tackling local issues as of February 2022.

Circular Economy Practices Through Inclusive Communities

The SDGs Yokohama Kanazawa Living Lab is building circularity within the 3Ps (Planet, People and Prosperity.) Since Kanazawa ward has the only beach in the city, maintaining the ocean environment is their primary concern. Their choice method is circular agriculture. The local farmers utilize discarded eelgrass in the Kanazawa as fertilizer, and grow vegetables with a local primary school and a special education school. Using the vegetables grown and local ingredients, they create a unique seasoning called "Kanazawa Hachimi". The whole activity consists of inclusive community development, local consumption, sustainable education, and regional promotion while protecting the ocean environment.

Aside from the living labs, many companies and organizations support the circular economy in Yokohama. People Port Inc. upcycles used computers, for instance. Their project “ZERO PC” includes two types of “zero” concepts: making zero carbon emission and zero domestic refugees* (*For the purposes of this article, refugee refers to those applying for refugee status). To achieve these goals, they are taking the following actions:

- using 100% regenerative energy at their office
- reducing waste as much as possible by recycling every part of old computers
- hiring refugees as upcycling computer engineers and building their skills so that they can make their living even after leaving Japan

Furthermore, they donate part of their proceeds to organizations that support child poverty. Their contribution depends on the number of used computers they collect. This way, the more computers upcycled, the more children are supported. There is another organization working on circularity. The 3Ps Yokohama City Resource Recycling Business Cooperative runs “The Yokohama Reuse Bin (Bottle) Project”. It provides reusable glass bottles for locally made fruit juices produced in Yokohama. Its uniqueness lies in how they manifested a local child’s idea. In 2014, they received a picture diary entry that asked since reusable glass bottles are more eco-friendly than single-use bottles, why was it not the mainstream option. They felt the urgency to take action and implemented the idea. Since then, the picture diary has become a symbol

in the city – displayed as poster at bars and restaurants in the city. People learn about the environmental issue while enjoying a locally produced beverage filled in bottles mooted by the Yokohama Reuse Bin. They consider bringing such ideas to life is the responsibility of adults. Yokohama City Resource Recycling Business Cooperative will keep seeking for new ways of sustainable city development together with local citizens, including children.

Our Future: Innovation Philosophy

Developing inclusive communities is but one of the pillars of Yokohama’s circular economy. Its full essence can be understood through studying other philosophies, such as modernizing traditional habits (e.g. haishop) or regenerating ecosystems from Yokohama Blue Carbon. We see how the people in Yokohama lead circular economy with a foundation in innovation and by attracting diverse talents.

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World Circular Economy Forum 2018

<https://circular.yokohama/en/about/why-we-promote-a-circular-economy-in-yokohama/>

In October 2018, Yokohama held the World Circular Economy Forum 2018, hosted by Sitra (Finnish Innovation Fund), in Pacifico Yokohama, bringing companies and government officials from around 85 countries together to promote a circular economy. In addition, the International Conference on Sustainable Brands 2020 Yokohama was held in February 2020. The city have established its position as a member of the global sustainability urban community.



“The long-term roadmap to maximize circularity will be to reuse, as it minimizes leakages of materials and maximizes the added value per unit weight of the used resource.”

-Enzo FAVOINO

Image Source: Wikimedia Commons. October 13, 2018. Flea market, Naschmarkt in Wien. Photo Credit: Gugerell. https://commons.wikimedia.org/wiki/File:Wien_06_Flohmarkt_b.jpg



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Sustainable resource management in Europe and Italy

Magdolna MOLNÁR (MM): You have helped government institutions and local authorities across the EU with the implementation of sustainable waste and resource management schemes. What are the main benefits for local communities to shift to more circular practices?

Enzo FAVOINO (EF): The EU agenda on circular economy, which is now being adopted worldwide, is about retaining resources/materials in the loop, at their highest value, for as long as possible. Adopting a “Zero Waste (ZW)” approach provides the perfect toolkit to turn that vision into operation-

al reality. The rationale of the EU’s circular economy strategy is much larger than environmental sustainability. Circular economy and ZW aim at reducing leakages of resources, and thereby increasing resource efficiency at both the production and consumption stages. This decreases the need for disposal infrastructure (and its related environmental impacts) and primary raw materials (with related pressure on the planet’s limited resources). Also, increased efficiency offers economic benefits, estimated for the EU system at about 2 billion Euros. Further, since activities related to circular management of resources, such as separate collection, recycling, composting, repair and reuse, are much more labor intensive than disposal at landfills or incinerators, this yields occupational benefits, estimated to be about 500,000 direct jobs in Europe; similar calculations were found in the US context, with a population of 300 million, seeing 1.2 million new direct and indirect jobs created.

One more specific angle must be noted. Typically, most activities related to ZW and circular economy are connected to local activities, such as new business models based on “product as a service”, local composting activities, and repair and reuse centers. This keeps the resources as well as the value added from related activities within or near the communities.

MM: Milan is one of the biggest success stories in Italy – and Europe – for the collection of organic waste, with 62% separated at source. What can other cities learn from Milan?

EF: Yes, Milan, with a population of 1.4 million, 800,000 daily commuting workers producing food scraps at least for lunch, and 11 million annual visitors, implemented separation at source for food waste deriving from households in late 2012; the system was implemented for large producers in 1995. Milan currently captures about 103 kg of food scraps per person annually, along with garden waste collected through a different scheme, which equates to 87% of all organic waste generated by the city.

Key learnings from Milan are: (1) Intensive kerb-side (door-to-door) collection of organic waste may be implemented in densely populated areas with high-rise buildings (90% of Milan's population lives in such buildings). (2) Of course, in a big city this cannot be done overnight, but it does not take ages either. Milan implemented separation at source in 4 steps by splitting the city into 4 areas, to show that this could be done with different housing types, whether in the city center or the outskirts, or with narrow streets or larger roads. The implementation started in November 2012 and every 6 months the next step was implemented, eventually covering the entire city by June 2014. So, it took 18 months to implement, not a century. (3) The system must be made user-friendly. Separate collection of organic waste must be made easier than that of residual waste. This may be achieved by reducing the collection rounds for residuals and using tools such as paper-based or EN 13432 certified compostable plastics to increase capture and prevent people from using ordinary plastic bags – although conventional plastic shopping bags

are now fully banned in Italy. (4) In a large city, one must proactively involve all ethnic communities. Milan is host to about 50,000 Filipinos, 30,000 Egyptians and 25,000 Chinese, besides Peruvians, Indians, Ukrainians, etc. Through a targeted campaign and with instruction booklets translated into 10 languages all communities were made to feel like a part of the city's effort. One may say "it is the organizational context that triggers the proper behavior". Once the system is well designed and running, people behave as desired, regardless of their cultural legacy.

MM: According to the latest Circularity Gap Report, only 8.6% of the materials we use are put back into circulation. Which main challenges do we need to overcome in the next few years to drastically narrow this gap?

EF: First and foremost, one must improve the recycling system and reduce its leakages. We say, recycling is plan B for sustainability, with Plan A being reduction/reuse. However, recycling is the low-hanging fruit in circular economy – it is the ready-to-implement strategy that delivers maximum results in the short run (i.e. diversion from disposal, environmental benefits, economic savings and occupational benefits). Hence, while we pave the way to more reuse and waste reduction, we must keep recycling and minimizing its critical issues. In particular, while recycling of glass, paper, metals and organics are reasonably operationally solid, quite a few problems must be addressed for plastics. The presence of numerous polymers, of which only a few are technically or

economically viable to recycle, is hampering real recycling rates even after separate collection, which must be done to follow the principle of Extended Producer Responsibility crafted in EU Directives and returns the responsibility of the packaging management to producers. One must note that the EU Plastic Strategy, the Packaging Waste Directive and the Single-Use Plastics Directive have started moving in the right direction, for example, by banning materials that are hard to recycle, promoting design for recycling, and using “Minimum Recycled Content” as a measure to increase the market potential for recycled polymers, among other initiatives.

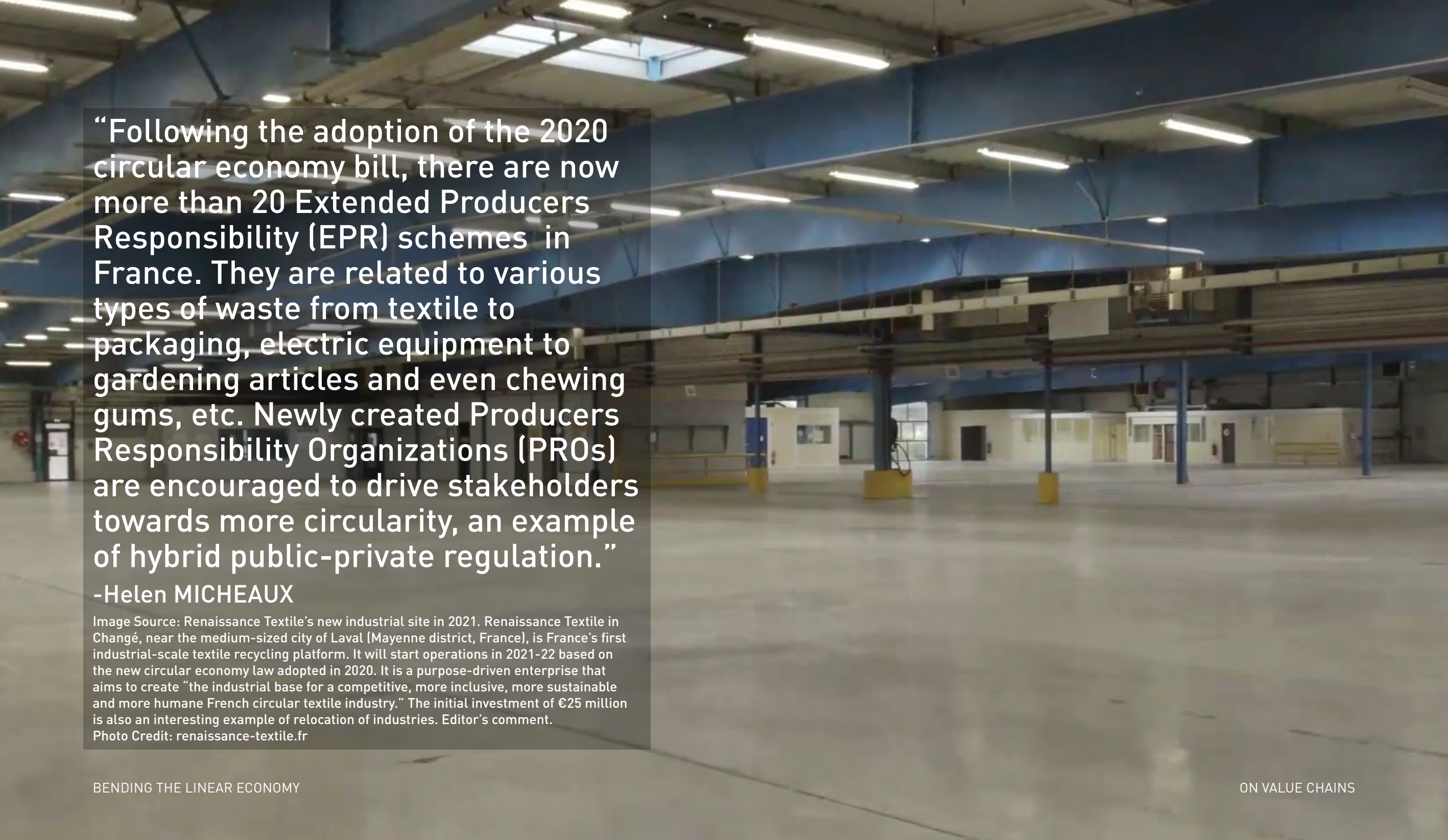
The long-term roadmap to maximize circularity will be to reuse, as it minimizes leakages of materials and maximizes the added value per unit weight of the used resource. In this respect, it will be important to promote new business models based on “product as a service”, and adopt enabling policies and practices, making dedicated deposit-return schemes (DRS) ubiquitous, and adopting economic/fiscal incentives.

MM: To what extent do European regulations and funds support or hinder its path to a circular economy?

EF: The EU has long adopted policies that aim at maximizing circularity. The most important ones so far are: (a) The EU recycling targets stipulated by the Waste Framework Directive. (b) Mandatory separate collections, such as for biowaste and textiles. (c) Obligations stipulated in the Landfill Direc-

tive, such as the obligation on pretreatment which makes landfilling more expensive and less impactful. (d) EPR schemes mandated by the Packaging Waste Directive, and related specific recycling targets.

Lately, there has been a huge move to fully align the EU (and EIB) funding policy with such policies, and with the overarching principles of circular economy. Hence, now major EU grants/funds, as a norm, explicitly exclude landfilling, incineration and any type of residual waste management. Also, the EU taxonomy of sustainable finance has adopted the “DNSH” principle, which states that incineration and landfilling may not be considered sustainable finance since they may harm the circular economy. The DNSH principle has since been adopted to make incineration ineligible for such funds, like the Recovery Funds. This is important since most EU funds in the past were directed into heavy infrastructure such as landfills and incinerators, making them cheaper than composting and recycling. This hampered efforts to promote true circular management of resources. However, we still have to refine some funding policies as well as correct some flaws and loopholes in the system. For instance, many are calling on EU institutions to include incineration in the Emission Trading Scheme (ETS) to make it pay for carbon emissions. The carbon footprint of the energy produced through incineration is already markedly higher than that of the average EU energy mix. In the age of decarbonization, we cannot afford this especially given the EU’s commitment to become carbon neutral by 2050.



“Following the adoption of the 2020 circular economy bill, there are now more than 20 Extended Producers Responsibility (EPR) schemes in France. They are related to various types of waste from textile to packaging, electric equipment to gardening articles and even chewing gums, etc. Newly created Producers Responsibility Organizations (PROs) are encouraged to drive stakeholders towards more circularity, an example of hybrid public-private regulation.”

-Helen MICHEAUX

Image Source: Renaissance Textile's new industrial site in 2021. Renaissance Textile in Changé, near the medium-sized city of Laval (Mayenne district, France), is France's first industrial-scale textile recycling platform. It will start operations in 2021-22 based on the new circular economy law adopted in 2020. It is a purpose-driven enterprise that aims to create “the industrial base for a competitive, more inclusive, more sustainable and more humane French circular textile industry.” The initial investment of €25 million is also an interesting example of relocation of industries. Editor's comment.

Photo Credit: renaissance-textile.fr



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The role of the extended producer responsibility principle in the circular economy policy in France

The EPR system: A European principle

The emergence of the consumerist society and the consequent huge increase in the volume of waste has put municipalities in great difficulty and affected their capability to deal with this phenomenon. In Europe, reflections began around 1990 to find avenues to finance waste management and encourage prevention through cleaner production systems. Thomas Lindhqvist proposed, at the behest of the Swedish Ministry, the concept of Extended Producer Responsibility (EPR) based on the “polluter-pays” principle (Lindhqvist 2000). The concept was introduced in the directives of the European Union (EU) related to waste management, first concerning used batteries (1991) and then packaging (1994). The aim was to integrate the cost of waste disposal into the cost of the product, with the expectation that producers will improve the waste profiles of their products, thus reducing

waste and increasing ways to reuse and recycle. In parallel, recycling targets were implemented for the first time in Europe.

EPR systems and the creation of PROs

To fulfill their obligations, producers can either opt for individual action – where they have to set up a specific scheme to collect and treat waste – or choose a collective scheme based on the delegation of operations and responsibilities to intermediaries known as Producer Responsibility Organizations (PROs). Producers usually pick the second option to pool logistics and waste treatments to achieve economies of scale. EU’s regulations also allow its Member States to decide the constitution of the PROs, which can be from the private or public sectors. In France, PROs are public-private hybrid organizations and have become key actors with significant influence on the waste sector operations and dynamics.

The French hybrid regulation model

In France, PROs have specific legal and governance status as non-profit private companies with a public mission statement and a multi-stakeholder governance. Their role is to assume their members’ EPR obligations and achieve the targets negotiated with the State. Besides recycling targets, the State also defines the rules to guide the PROs’ actions after participative decision-making with stakeholders (i.e. NGOs, consumer associations, producer and recycling organizations, and public authorities).

The regulation is distinctly hybrid, with public and private actors operating via tailor-made governance and organizational mechanisms, with reciprocal commitments. Operational regulation is led by private actors, usually the PROs, which have crucial coordination roles. Public authorities have supervisory and framing roles and can activate various levers. The PROs' activities are formally approved for a fixed time period and are scrutinized by public authorities. These approvals can be removed if the results are unsatisfactory. The authorities can also introduce additional targets and specifications, and define or alter incentives or regulations if specific problems are encountered.

The role of PROs in the circular economy

EPR systems in France have been widely adopted and are at the heart of its circular economy policy. The French Anti-Waste Law for a Circular Economy n°2020-105, published in February 2020, also known as the AGECL law (Anti-Gaspillage pour une Economie Circulaire), reinforces the system and creates new schemes. There are more than 20 EPR schemes related to various types of waste (packaging, batteries, Waste from Electrical and Electronic Equipment (WEEE), chewing gum, cigarette butts, sports, gardening articles, etc.). Using these specifications, the PROs are encouraged to drive stakeholders towards more circularity. For instance, they are obliged to use 1% of their turnover to fund research, thereby stimulating innovation. PROs also often develop tools for their members. An example is the online

REEECYC'LAB tool developed by the ecosystem to help producers (i.e. their members) assess the recyclability of their products. Members enter data about materials, components, and assemblies into the REEECYC'LAB tool, which then assesses the product's recyclability and summarizes the results in a customized report. It identifies modifications to improve recyclability, proposes alternative design options such as using more recyclable materials or fewer complex joints to facilitate recovery, and suggests using recycled plastic wherever possible. For some sectors like e-waste, the responsibility of PROs goes beyond financial aspects to whole operations. This encourages them to influence treatment choices and support recovery partners by adopting innovative solutions. The AGECL law furthers the responsibilities of the PROs from contributing only to the management of the end-of-life products, to also preventing waste by financially supporting repair activities to extend the life of products.

Eco-design: The critical limit of EPR collective schemes

There are some major limitations of the EPR principle, especially in terms of eco-design (Micheaux and Aggeri, 2021), which was one of its main objectives. This collective system reduces the direct financial incentive for the producer to engage in eco-design to reduce treatment costs of its products because waste is collected and treated as a whole. The eco-modulation mechanism is designed to counter this lack of incentive by offering differentiated fees based on eco-design efforts. This would allow producers to benefit from fee

reductions or be penalized according to their efforts. However, the amounts of these bonuses and maluses are usually far too low to incentivize producers. The AGECL law reinforces this incentive; we have to wait and see if this will have a positive effect in the future.

Summary

French PROs are collective organizations and key coordinators between public authorities and the various actors of the waste economy (producers, recyclers, collectors, consumers, etc.). The missions and responsibilities of PROs are negotiated with the State for a contractual timeframe, and they are considered intermediaries which also participate in policymaking (Abbott et al. 2016). The French model is a hybrid of coexisting and complementary public and private regulations (Levi-Faur, 2011). While unilateral public action (command and control) can often be inefficient and also illegitimate, private action is frequently criticized for letting opportunistic behaviors and externalities lead to failures, especially in environmental and social matters. A hybrid form of regulation is thus a government technique and governance method to make private actors responsible (creating accountability) while equipping them with new capabilities (creating empowerment). However, there are still limits, as we have pointed out, with the lack of incentives for eco-design. This is common in complex and uncertain issues for which direct public intervention is difficult to design, implement, monitor and sanction.

The French case shows a way to ensure that actors maintain a virtuous trajectory that is aligned with the revisable and adaptable nature of the system. The French system is constantly evolving, and the condition for this is the existence of a collective comity that manages the various EPR schemes in which all stakeholders are represented. It is stated that “the [French] collective governance is seen as a critical element of success, and all stakeholders consider that the dialogue created and sustained through the scheme per se has a tremendous influence on its overall performance” (OECD 2016, 249-256).

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“Waste-pickers in the Global South, by developing low-tech processes to tackle odd materials, or by implementing co-management in recycling governance models, are reminding us that environmental sustainability is the flip side of social equity and economic justice.”

-Sebastian CARENZO

Image Source: The Incubation Network.
Photo Credit: SecondMuse, all rights reserved ©.





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Is there room for waste-pickers in the circular economy transition in the Global South? Food for thought from Latin America

In the Global South, the recycling industry has become a strategic sectoral driving force for the transition to a circular economy by prompting innovations and disruptive business practices that challenge the business-as-usual linear mindset. However, inequalities and blind spots along its value chain could jeopardize these contributions. Waste-pickers provide, on average, up to 50-90% of the materials that feed into industrial recycling processes, but receive less than 5% of the income generated along the value chain.¹ Research also shows that up to 50-60% of discarded plastic materials are not recycled by local industries due to low profit margins.

Thus, ironically, circular and innovative business models are being built upon labor inequalities and market constraints against sustainability. These challenges have plagued the

linear economy since the industrial revolution and are likely to hamper the long-term sustainability of the recycling industry, weaken livelihood opportunities for waste-pickers, and reduce the range of materials to be processed and recycled. The COVID-19 pandemic has foreshadowed a disturbing dystopian scenario. During lockdowns in urban metropolises, the ban of informal curbside collection has badly impacted the supply of recyclables along the value chain, indicating its dependence on waste-pickers' labor.²

Further, it is becoming increasingly evident that providing a trained workforce to retrieve and classify recyclables from waste is not the sole value add by waste-pickers to the circular economy transition. Waste-pickers are developing new market niches and technological innovations to reuse and recycle odd materials that have remained “out of sight” for the recycling industry, such as post-consumer expanded polystyrene (EPS) which is widely used in food and home appliances packaging. Even when collected by waste-pickers, EPS is usually rejected by intermediaries and recycling manufacturers due to its costly logistics (i.e. negative weight-to-volume ratio) and the technical complexities in its transformation. Most post-consumer EPS ends up in landfills and dumpsites, worsening its environmental impacts.

This issue inspired an R&D process led by waste-pickers at the Recycling Dreams Cooperative in Buenos Aires, Argentina. This yielded new processes to transform post-consumption EPS into “EPS pearls”, which are used for lightweight

concrete structures and insulation by the local building industry.³ While most commercial brands produce these pearls from virgin polystyrene, the Cooperative's product is made by reusing discarded EPS, thus converting the once-valueless waste into a sustainable alternative which is sold at USD 1.00 per kg on average. The Cooperative is currently producing up to 50 tons of recycled EPS pearls each month, making it a key income source for its 30 associates. It is also moving towards upscaling the process by involving another ten cooperatives which are part of a national federation of waste-pickers.

Overall, this innovation, derived from the waste-pickers' skills and experience, went beyond the designing and manufacturing of tangible artifacts and machinery, to intangible dimensions such as a circular conceptualization of EPS as waste and marketing strategies to monetize this output.

In parallel, the waste-pickers are also developing governance innovations to foster their contributions to the Circular Economy.⁴ Seven cooperatives located in the outskirts of São Paulo, Brazil have created a network called Coopcent-ABC to enable the collective commercialization of their products. This has allowed them to achieve greater volumes and therefore get better prices than selling directly to the recycling industry. This innovation has also helped involve the waste-pickers in the co-management of official reverse logistic initiatives with local governments, manufacturers' chambers and corporations. Since 2016, Coopcent-ABC has

established a contract with the Brazilian packaging industry for cleaning products, personal hygiene, perfumery and cosmetics (ABIHPEC). Coopcent-ABC collects and reintroduces packaging into the recycling market, thus helping ABIHPEC comply with their reverse logistics requirements; in turn, ABIHPEC provides funding to strengthen Coopcent-ABC's cooperatives and help develop new inclusive recycling programs.

Waste-picker organizations are therefore extending the circular economy framework beyond the mainstream, which focuses a great deal on industrial engineering, product design and marketing. By doing so, they have brought some unresolved dilemmas of the circular economy to the forefront, such as dealing with labor informality and social inequalities, and are providing insights into tackling these challenges.

As we have seen, whether by developing low-tech processes to tackle odd materials considered non-recyclables or by implementing co-management in recycling governance models, waste-pickers are reminding us that environmental sustainability is the flip side of social equity and economic justice. This is not limited to strengthening the livelihoods of socially marginalized groups. It is about daring to seriously account for their techno-cognitive skills as key assets and drivers as we move further into the transition to a circular economy in the Global South, and beyond.

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A wide-angle photograph of a bustling outdoor goods hall at a railway station. The ground is covered with numerous stacks of cardboard boxes, some wrapped in white plastic. Several people are seen walking through the area, some pushing carts. In the background, railway tracks and a bridge are visible under a clear sky. The scene is filled with activity, suggesting a busy day of logistics and commerce.

“Today, India has the option and the opportunity to play a role in addressing the emerging global climate risks and providing energy and nutritional access to communities by (a) increasing its overall uptake of responsibly sourced imports, (b) consciously planning domestic production and (c) reusing waste for energy generation.”

-Neha SIMLAI

Image Source: Wikimedia Commons. December 20, 2010. Goods Hall, New Delhi Railway Station. Photo Credit: Bruno Corpet (Quoique). <https://commons.wikimedia.org/wiki/File:Gare-New-Delhi-Marchandises-1.JPG>



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Responsibly sourcing, palm oil trade and India: A wheel of change for the circular economy

Estimates regarding our planet's ecological footprint reveal that, currently, it takes nearly 1.7 times ¹ the available resources in our planet to meet the demands of the 7.9 billion people living on Earth. The "Earth Overshoot Day" marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year; in 2021, that date was July 29.

With an estimated population of approximately 1.4 billion, India is responsible for 6% of the global resource demand.² While India's ecological footprint is relatively low, its bio capacity is even lower, leading to a large deficit. India's ecological footprint per capita is 1.19 global hectares (gha),³ whilst its bio-capacity per capita is estimated at 0.43 gha. India's total ecological deficit ⁴ is estimated to be more than -1 billion global hectares.

As geopolitics takes shape against the backdrop of the destabilizing effects of the combined COVID-19 pandemic and Russia-Ukraine crisis – with commodity prices increases and impending shifts in supply chains – another crisis is emerging: a growing gap in the demand and supply of India's natural resources.

This ongoing crisis of an ever-increasing ecological footprint, is typified in the case of palm oil. Palm oil is used by most Indians on a daily basis in products from toothpaste, soap and moisturizers to ice cream, milk powder and bakery products; margarine and loose edible oil (Vanaspati) are used in an array of Indian savories. Additionally, it is estimated that 50% of consumer products,⁵ including make-up, hygiene products and household foods, contain palm oil. Palm oil in India ⁶ is also largely used for cooking purposes by businesses and individuals (75%), and by the processed food industry (17%).

India remains influential in the global supply chains for palm oil,⁷ and the main driver of regional trade flows, being the largest importer and the second-largest consumer.⁸ The country imports ~16% of the global palm oil imports (largely from Indonesia and Malaysia) and consumes around ~12% of the total global production.

However, the issue is not one simply of demand and supply. In India, and across most of the developing world in Africa, Latin America and Asia, food security, trade relations, and increasing self-sufficiency heavily shape the national govern-

mental priorities and the agenda on trade in general – particularly on palm oil – especially as the Russia-Ukraine crisis plays out.

The Government of India recently launched the national mission to boost domestic production,⁹ and thereby reduce import dependence, to keep palm oil prices low and save foreign exchange. While domestic production is expected to triple over the next five years (~1.1 MMT by 2026), independent studies reveal that India is likely to continue depending on imports ¹⁰ to meet >80% of its demand, even if the current consumption levels are maintained.

In this context, India continues also to shape the regional trade balance and the potential intersections with Forest-Positive Commodity Supply Chains, ensuring a substantial political capital. Through independent representations by CSOs, key government departments are now being convened to better articulate the need for a level playing field in the responsible sourcing of key commodities like palm oil. Given India's commitments to the Sustainable Development Goals and its strong statements at Glasgow in 2021 (COP26), palm oil could be the filament of the import-consumption-responsible sourcing-stewardship conundrum. New research details the complexity of global value chains, India's demand and a possible solution to global deforestation risk.

In an effort to maintain economic and social growth, Indian businesses and the government are already exploring invest-

ment potential in areas of increased food system productivity. Predominantly, the focus is on the palm oil area expansion and resource-efficient production under an “in India, for India” narrative. Significantly different from the work being done in other parts of the world, India is only beginning to identify and address the multiple social, environmental and economic challenges associated with palm oil imports.¹¹

In contrast, the European Commission's decision to phase out palm oil in biodiesel by 2030 helped Europe leapfrog its drive towards sustainability in its palm oil trade with a focus on oleochemicals. This, in turn, had far reaching effects in Indonesia and Malaysia, changing production practices in plantations and getting 86% of European palm oil use to being sustainable as of 2020. But does the EU's use of sustainable palm oil halt global deforestation? Perhaps not. The thrust of the problem lies in the fact that despite the environmental challenges associated with it, palm oil continues to sustain much of the developing world, including India.

EU's Green taxonomy regulation was approved in April 2021 by the European Commission and provides companies with a list of compliance guidelines and threshold related to environmental activities. Companies need to adhere to these guidelines for their activities to be considered sustainable and are required to report against the framework under the Corporate Sustainability Reporting Directive (CSRD). These regulations are not just applicable to UK/EU-based businesses, but impact their overseas value chains as well.

India has, until now, remained conservative on any major (policy or market) action that could limit the deforestation risk in its palm oil imports. This remains a crucial game-changer in setting the regional sustainability agenda. Even if India were to make a significant shift in edible oils, crude palm oil would still remain an important stock of biodiesel and will likely continue finding global buyers, considering its prices. As a result, this, implies that global deforestation risk will continue to rise.

At the COP26 summit in Glasgow in November,¹² Prime Minister Narendra Modi pledged to cut India's total projected carbon emission by 1 billion tons by 2030, reduce the carbon intensity of the nation's economy to less than 45% by the end of the decade and achieve net-zero carbon emissions by 2070. India's Finance Minister, Nirmala Sitharaman mentioned in her budget speech for 2022, "The Circular Economy transition is expected to help in productivity enhancement as well as creating large opportunities This will be supported by active public policies covering regulations, extended producers' responsibilities framework and innovation facilitation."

From a policy perspective, 2022 might be a year of great significance for climate disclosure in India as the Securities and Exchange Board of India (SEBI) introduces mandatory climate disclosure under the new Business Responsibility and Sustainability Report (BRSR) disclosure norms.

In the broader context, some groups have been advocating a shift away from palm oil. It appears that this approach is not feasible, since removing palm oil across product lines could result in agricultural expansion of other commodities in other areas or a shift to other products that may come with other trade-offs. More importantly, a shift away from palm oil production may discourage the efforts of global companies, that have made public commitments on responsible sourcing and are already in the process of improving their value chains. This will also take a toll on India.

A larger uptake of sustainably produced and responsibly sourced palm oil in India will create benefits of scale in producer countries as well, thereby serving global circularity and reducing sourcing costs. Increased demand will also create economic incentives for palm oil producers to delink deforestation from their production and apply good agricultural practices.

Today, India has the option and the opportunity to play a role in addressing the emerging global climate risks and providing energy and nutritional access to communities by (a) increasing its overall uptake of responsibly sourced imports, (b) consciously planning domestic production and (c) reusing waste for energy generation. The leadership role is ours for the taking.

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“The contradiction between the cross-border nature of supply chains and their design in national contexts poses a particular challenge in the transition to a circular economy for governments and all stakeholders in global supply chains.”

-Holger KUHLE

Image Source: Wikimedia Commons. August 7, 2017. Gebang leaves from Gorontalo are loaded by trucks at the Pagimana ferry port and then to Makassar with the final destination of Bali as raw materials for all kinds of decorations. Photo Credit: Marwan Mohamad. https://commons.wikimedia.org/wiki/File:Daun_Gebang.jpg



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Commitment to global supply and value chains' transition to circularity

What factors need to be considered moving forward and how can due diligence be leveraged to achieve ecologically aligned circular value chains?

A number of countries are wary, particularly those in the Global South, of tinkering with their contribution to global trade. They want to defend their status in the existing linear value chains they have built up over decades and trust that they will be able to exploit even more of the potential that comes from the well-rehearsed development path. Global supply chains (GSC) and global value chains (GVC) provide opportunities for countries to integrate into the global economy at lower costs by producing only certain components or tasks – that they excel at – rather than complete final products – for which they would struggle to deliver. The World Trade Report from 2014 reveals that the “share of trade in parts and components between developing

countries has quadrupled over the last 25 years”, but also highlights that “gains from GVC integration are not automatic” and “involve risks. For example, while it may make industrialization easier to achieve, competitive advantage can become more fleeting, increasing vulnerabilities to relocation of firms.”¹

Countries hesitate to lose their position within GSC. Their interest in preserving and expanding their place in the process of globalization contains a potential for resistance against technologically innovative “creative destruction”. While the Global North believes that the diffusion of its technological solutions will ensure sustainable economies in the Global South, actors in the Global South tend to be cautious and anticipate that the transformation of production processes might destabilize their economic position and ecosystem. The experience of how the incessant technological changes in global industrial operations not only produce new consumer goods, but also new production or transport chains has been already widely diffused worldwide. Hence, it has become clear that the business partner of today may suddenly turn into a competitor and even force one completely out of the market. In the Global South, the last decades have been often perceived as playing a part of increasing economic importance in global trade since the beginning of decolonization. Anything that threatens to restructure these achievements appear, in the eyes of some, as a step backwards to weaken their position.

These concerns become even more virulent as the circular economy does not only converge with increasing digitalization, but the latter also announces itself as its enabler. While it is foreseeable that circularization will change the rules and relationships within supply chains, it cannot be ruled out that the digitalization emerging from the tech industry will eventually hijack the norms in place within supply chains. However, there are concerns that only those who bring about the reorganization of supply chains will have this power and opportunity to apply the innovation.

What are factors conducive for moving forward?

Against the given global economic background, the principles of circular economy may prove to be corporate duty of care in an ecological dimension if:

There are mechanisms in place to allow countries, especially in the Global South, to harness technological potentials for the transformation of global supply chains to circularity. These require a clear and shared understanding of the opportunities and potential trade-offs in regional and global trade frameworks.

All stakeholders are integrated in a non-disruptive transition. To address the radical environmental and social challenges faced by supply chain actors around the world, it is important to recognize that the rhetoric of disruption (i.e. feared here and idealized there) distorts the question of who society and state

should support in the circular transformation of supply chains. In essence, it is about a “just transition.” It is not only about financing innovative users of circular technologies and fueling their dissemination, but also supporting the social, economic and societal conditions of the transition.

To be non-disruptive, the principle of circularity should apply across all levels of supply chains, i.e., global, regional and local. This becomes possible if:

The rise of new regional and large country domestic supply chains in China and other emerging countries as well as their regional eco-systems are used as a basis to anchor and contextualize circular economy principles. The GSC, is often integrated across several countries within one world region. At the same time, new centers of consumption have emerged in the Global South with the growth of high-demand middle classes. The Chinese electronics industry, for example, imports almost 90 per cent of its primary products from other countries in East and Southeast Asia. Value chains are being reconfigured as companies decide how to compete in the many major consumer markets that are now dotted worldwide. Statistics show that “in 2016, 40 percent more cars were sold in China than in all of Europe, and China also accounts for 40 percent of global textiles and apparel consumption.”² The same estimations predict “that emerging markets will consume almost two-thirds of the world’s manufactured goods by 2025, with products such as cars, building products, and machinery leading the way. By 2030,

middle income countries are projected to account for more than half of all global consumption.”³

There is focus on the very local contributions to regional and global circularity. The specific local preconditions to participate in circularity, as demanded by the regional and global levels, need to be taken into account. It is key to tap into local “circulating” capacities for the benefit of the entire regional and global chains. At the very local organizational level, the transition to a circular economy pays off when the local circumstances do not have to only execute a global technological trend, but are able to harness local conditions and innovations to driver forward global circular solutions. In Kalundborg Eco-Industrial Park in Denmark, which is valued as a pioneer for Circular Economy, several companies in the same location exchange material waste, energy and water in an integrated closed-loop ecosystem. This process is known as industrial symbiosis.

Due diligence leveraged to achieve ecologically aligned circular value chains

These above mentioned regional and local dimensions are essential because ultimately this is where both circularity is implemented and due diligence comes into play. At the same time, the principle of corporate due diligence in GSC is intended to ensure that ecological demands, such as climate and biodiversity protection, consistently contain the economic cost considerations of international trade.

Against this backdrop, the circularity of value chains is not only dependent on the regional and local underpinnings, and vice versa. The regional and local levels are dependent on their global superstructure. The latter will be able to enforce due diligence through circular economy principles to the extent that:

Regional regulatory initiatives come up, such as the European Union’s guidelines, to set standards and due diligence frameworks.

Regional initiatives align with global efforts through integrating circular economy principles in trade agreements by considering the different needs between Global North and Global South. Currently, “more than 40 per cent of trade agreements in force today include provisions related to competition policy, investment, standards and intellectual property rights”.¹ GSC across the world, where state borders continue to endure, lack the power or incentive to resolve the contradiction between finite extractable resources and the infinite production, investment and consumption of said resources. The contradiction between the cross-border nature of supply chains and their design in national contexts poses a particular challenge in the transition to a circular economy for governments and all stakeholders in global supply chains.

Assessments and reporting integrate due diligence and circularity into monitoring and certification principles of large

leading companies, with adequate mechanisms in the lower segments of value chains. It includes a strong due diligence framework for primary raw materials.

Options of de-risking companies and countries that have a stake in the up-stream segment of value chains is explored (e.g., using tax and price policies) to increase profitability of due diligence and circularity-based products.

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outlook

Image Source: Flickr. March 2, 2022. United Nations Environment Programme Plastic Resolution. Photo Credit: © UN environment programme. <https://www.flickr.com/photos/unep/51913923286/in/album-72177720297066777/>

BENDING THE LINEAR ECONOMY

ON VALUE CHAINS

‘The other half’: Accelerating the circular economy transition is a response to disruptions in global supply chains and the fulfillment of environmental goals

Doubling the circularity of the world economy from 10% to 20% could reduce global greenhouse gas emissions by nearly 40%, by 2030, according to the global Call for Action endorsed by an international group of experts ahead of the Global Solutions Summit 2022 in Berlin.¹

The world economy is in need of transformation to reduce resource consumption and manage waste. Since 2012, the production of waste by cities has nearly doubled and is expected to reach more than 2.2 billion tons by 2025. It is further expected to double again, in the next twenty years, according to recent research by the G20 engagement group of cities. A recent report published by the Asian Development Bank Institute (ADBI) highlights that the issue of effective waste management is addressed by concepts of circularity. In developing Asia, where the expected population size in 2050 is 3 billion, a circular economy could serve as a critical component in improving resource efficiency as urbanization continues to increase.

One setback is that ‘COVID-19 recovery plans and investments are only loosely coordinated within the G7, the G20, and globally’ whereas ‘urgent responses to disruptions in global supply and value chains often ignore the great potential of the circular economy.

In her keynote address at the Global Solutions Summit 2022, the German Federal Minister for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), Steffi Lemke, addressed the role of circular economy as an important step towards the G7 Environment Ministers’ Summit. The extension of producers’ responsibility and the development of social and ecological due diligence framework in global value chains are part of that agenda.

For Charles Huang, Founder and President of Circular Taiwan Network and a founding member of the Circular Economy Dialogues Sounding Board, addressing changes in value chains is key. The COVID-19 pandemic and other geopolitical disruptions call for the move from global linear value chains to regional circular economy networks.

At Global Solutions Summit 2022, the Vice-President of the World Resources Institute (WRI) Europe, Stientje van Veldhoven, underlined the impact of the Institute’s flagship initiative, the Platform for Accelerating the Circular Economy (PACE) and highlighted the role of cities to accelerate transitions, an issue at the core of INTERSECTING Volume 9.

The world is in need of multilateral and multilevel solutions across the G7 and G20 to address major challenges, such as plastics. Less than 10% of all plastics created since the 1950s has been recycled and nearly 80% has ended up in the environment.

The adoption of a legally binding roadmap towards the adoption of a Treaty on Plastics by 2024, at the United-Nations Environmental Program (UNEP) General Assembly in Nairobi this February marks a major breakthrough. Developing a 'Circular Society' is inseparable from the implementation of a circular economy noted Alexander Bonde, the Secretary General of the German Federal Environmental Foundation at the Global Solutions Summit 2022. This not only offers immense environmental and economic prospects but also increases resilience while decreasing the dependence on other countries, he further stated. These key comments come in light of the current war in Ukraine and echo the findings of the authors of the present volume.

International cooperation and capacity-building are essential to develop circular economy in the Global South. According to Izabella Teixeira, co-chair of UNEP International Resource Panel and former Environment Minister of Brazil - a founding member of the CESD Sounding Board - there are huge reservoirs of green growth in middle- and lower-income countries' which will be successfully exploited if the younger generations understand the benefits of sustainable lifestyles. Izabella is notable for her significant contributions to the Paris Agreement negotiations. Circular economy and creative economy are inseparable concepts.

Speaking on the circular economy panel at the Global Solutions Summit 2022, Ingrid-Gabriela Hoven, Managing Director at GIZ, noted that circular economy as a means to

support climate mitigation efforts is becoming increasingly important as the urgency to raise climate ambitions grows. She noted that this is the leitmotif for GIZ's advisory services on circular economy and capacity building. These will only gain more importance in the near future.

For UNIDO, technology, in particular the development of the fourth industrial revolution, is an enabler for the development of a circular economy. In a policy note for the T20, the think-tank engagement group of the G20 Indonesia, twenty experts noted that a durable shift towards circular economy depends on four key factors: 1) expanding the responsibility of producers, and enforcing transparent and accountable standards; 2) developing both national plans and cross-border partnerships, supported by new policies and legislative actions with strong international dimension such as the European Union Sustainable Finance Taxonomy and the upcoming EU Sustainable Products Initiative package; 3) incorporating circularity into National Climate Targets (NDCs), an objective in preparation for the upcoming COP27; and 4) developing circular principles that enhance social justice. They also call for including cities in global decisions and pay more attention to the role of informal economy.

As illustrated by the EU Resource Efficiency Initiative (EU-REI), an EU-supported project for the Government of India, global cooperation is the cornerstone of the transition to a circular economy. The EU-REI supports the implementation

of the UN sustainable Global Consumption and Production agenda, as part of the Agenda 2030, in India. Such cooperation must happen globally, as emphasized since 2020 by the high-level G20 Resource Efficiency Dialogue. International cooperation needs to be localized and geared towards MMSMEs. It should also include workers from the informal economy.

Engaging youths as well as interconnecting global issues such as plastics and supply & value chains with the concept of cities, are the next steps in the dialogue series on circular economy. We believe taking this direction would benefit from the better linkages established with the fields of creative economy and the future of work.

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“In 1972, the United Nations convened the first major conference on international environmental issues in Stockholm, Sweden, and yet fifty years later, unsustainable consumption, fueled by ever increasing material extraction is generating exponential amounts of waste and pollution. This calls for continuous and innovative efforts and investments to bend the linear economy.”

- the editors

Image Source: Press Conference by Mr Maurice Strong, Secretary-General of the United Nations Conference on the Human Environment at the Old Parliament Building, Stockholm, Sweden. A press conference held at the end of the Stockholm Conference. 4 June 1972. Photo Credit: © UN Photo/Yutaka Nagata. Source: <https://legal.un.org/avl/ha/dunche/dunche.html>

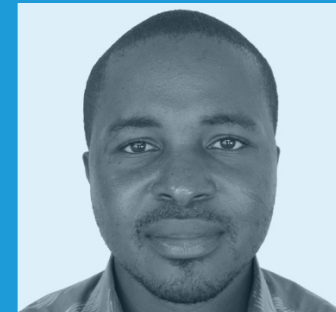
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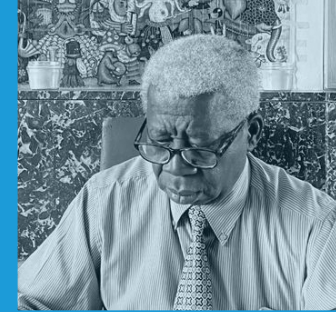
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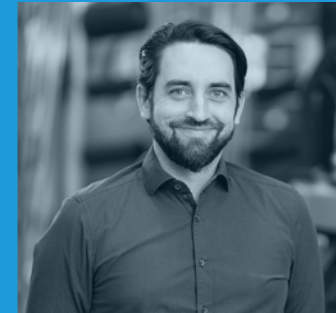
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Image Source: Progress toward a circular economy has gained pace over the last decade but adherence to its key principles remains uneven among pressing macroeconomic priorities such as inflation including rising prices of basic commodities. Policy solutions must come from global and local scales altogether. Global Solutions Summit 2022. From left: Ingrid Gabriela Hoven, GIZ, Beatriz Luz, Exchange 4 Change, Michael Zimonyi, IFRS Foundation, Nicolas J.A. Buchoud, Moderator.

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