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The CIRCULAR ECONOMY and GREEN JOBS in the EU and BEYOND

edited by
Janis Brizga and Saïd El Khadraoui

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Contents

Foreword

By Frans Timmermans, Executive Vice-President for the Green Deal (European Commission)

The present book comes at a pivotal moment in the fight against the climate, biodiversity and pollution crises. These crises – without any exaggeration – threaten our very survival as humanity. Tipping points are getting dangerously near, and the window for decisive action is closing fast.

The Covid-19 pandemic, which continues to dominate our daily lives, has underlined the urgency of stopping the destruction of our natural environment and exposed the fragility of the current global economic model. And when it comes to climate change and ecocide there will be no vaccine to help us cushion the impact. We will need to transform our economy as a whole and regain our balance with nature.

The European Union is working to become climate neutral by 2050. We aim to be the first, but we challenge everyone to beat us to it, because in a global race to net zero we are all winners. Reaching the finish line requires that we decouple growth not just from emissions, but also from resource use.

The extraction and processing of resources accounts for 90% of biodiversity loss and over half of total greenhouse gas emissions. Our outdated model of take, make, use and dispose cannot continue. Instead, we must profoundly change the way that products and services are designed, made and consumed. This is a true paradigm shift: for more than two centuries, our economies have grown at the expense of nature. We now need to overhaul that entire model in just one generation. But we have the tools we need to do it and we know where we need to go.

The circular economy is the model of the future, for Europe and the world. This is why it is one of the pillars of the European Green

Deal. Making our economies circular could cut EU industrial emissions by 56% annually by 2050. It would bring balance back to our relationship with nature and reduce our vulnerability to disruptions in global, complex supply chains.

Against this backdrop, I welcome this timely assessment by FEPS and its partners. Shifting to a circular economy provides a great economic opportunity and is essential for a socio-economic transition, as this book rightly emphasizes . With the green transition as a whole, we have to make sure we leave no one behind and create the social support to bring people along. We need to ensure that this transition is just, or there just will be no transition.

As we go through this transition, we need to rethink our value chains and tap into the potential of circular business models, from service-based systems and systems for reverse logistics to collaborative consumption and sharing economy models. We also need to fundamentally rethink and redesign our products so that they are durable, reusable, repairable and safe by design. Products should be designed for high-quality recycling and be made themselves of recycled materials as far as possible. With the upcoming Sustainable Product Policy framework, the European Union can become a global trailblazer in this area.

Continuous modernization of waste management systems also remains key. Building well-functioning markets for the highest-quality recycled materials and making 'Recycled in the EU' a benchmark worldwide would create real and sustainable jobs whilst reducing our dependence on primary raw materials.

The shift to a circular economy needs to happen at a global scale as well. This is why we launched the Global Circular Economy and Resource Efficiency Alliance together with UNEP, why we push for ambitious global agreements across the board, and why we work with businesses from all over the world.

Many of the steps that this book prescribes are necessary to spur on the required paradigm shift and create a self-regenerating system. There is still time to make these changes, but it is quickly running out. So we need to act with urgency and restore the balance with our natural environment. This is how we can ensure a better life for ourselves and for all those who come after us.

THE CIRCULAR ECONOMY AND GREEN JOBS IN THE EU AND BEYOND

Introduction

By Janis Brizga and Saïd El Khadraoui

When it comes to many natural resources, the earth presents the properties of a closed system. This means that once a unit of raw material is extracted, transformed into a good and disposed of as waste, the stock of raw materials that can be found in nature and can be used as inputs for production has decreased. As the human population and our economies have grown, so has our material throughput, i.e. the quantity of materials that we consume. In the classical production model – sometimes referred to as 'take, make, waste' – this has led to a decrease of raw material stocks on the one hand and an increase of waste stocks and pollution on the other. This is also reflected by numbers tracking the evolution of global resource use. Global resource extraction has steadily increased from about 30 billion tonnes of extracted material per year in the 1970s to over 80 billion tonnes at the beginning of the last decade.[1] The problems of continuing along this trend have also been acknowledged by the European Commission, which notes that: 'Global consumption of materials such as biomass, fossil fuels, metals and minerals is expected to double in the next forty years, while annual waste generation is projected to increase by 70% by 2050.'[2]

In addition to the depletion of material stocks, expanding human economic activity has severely impacted the capacity of ecological systems to regenerate themselves. Ecosystems providing humans (and other species) with amenities like clear water and fertile soil have in some cases been reproducing themselves over the course of

1 Hickel, J., and Kallis, G. 2019. Is green growth possible? *New Political Economy* 25(4), 469–486 (https://doi.org/10.1080/13563467.2019.1598964).

2 European Commission. 2020. Circular economy action plan: for a cleaner and more competitive Europe. Report, European Commission, p. 4.

millennia. In recent times, overuse and pollution have, however, started to disrupt these systems. Importantly, the constant and rising extraction needs of the linear economy model are also closely linked to the global crises of global warming and biodiversity loss, thus making the need for change all the more urgent.

Against this background, in which human activities are depleting the earth's materials and are threatening to irreversibly change some of the most important support systems of the planet[3] – a state referred to as the Anthropocene[4] – the need to find an alternative economic model is as clear as it is urgent.

One model that has been proposed to achieve this revolutionary change in humans' interaction with the earth is the circular economy. The basic intuition behind this concept is fairly understandable in the sense that it aims to replace the linear economic system with a closed and self-regenerating system that no longer takes disproportionate amounts from ecological systems while imposing waste and pollution on them. How to get to this state, however, is a much more difficult question.

This edited volume addresses some parts of this large question by taking a close look at the actors, business models, supply chains, trade relations, legal provisions, citizen ethics and jobs that need to be created or to undergo profound changes as we move towards a circular economy. It offers a systemic account of what is, indeed, a systemic transformation.

Importantly, the contributions go beyond arguing for a circular economy insofar as they critically engage with the concept and its existing (mis)interpretations and implementations. For instance, the dominance of recycling over the avoidance of waste is challenged in more than one of the contributions. Moreover, some of

3 Steffen, W., Richardson, K., Rockstrom, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Biggs, R., Carpenter, S. R., de Vries, W., de Wit, C. A., Folke, C., Gerten, D., Heinke, J., Mace, G. M., Persson, L. M., Ramanathan, V., Reyers, B., and Sorlin, S. 2015. Planetary boundaries: guiding human development on a changing planet. *Science* 347(6223), 259855 (https://doi.org/10.1126/science.1259855).

4 See, for example, Biermann, F. 2014. The Anthropocene: a governance perspective. *Anthropocene Review* 1(1), 57–61.

the contributions explore the distributive and political–economic implications of a circular economy. They highlight the effects of current and future circular business models on less affluent households as well as the conditions of workers in the circular economy. This explicit consideration of the social and distributional effects of the circular economy offers a crucial but often overlooked perspective. Taking into account the fairness dimension also allows policymakers to see which actors stand to benefit from initiatives that promote the circular economy and to ensure that the design of such measures gives ownership to workers and vulnerable populations instead of subsidizing exploitative and centralized business models.

When discussing the political economy of the circular economy, some of the contributions also touch on broader questions related to the green-growth/post-growth debate, e.g. by critically assessing the claims about job creation and increased economic efficiencies that are often associated with the concept (e.g. in the Commission's circular economy strategy).[5]

Beyond contributions to academic debates, the volume offers insights for policymakers and stakeholders as it outlines concrete recommendations for advancing a circular economy agenda that explicitly takes questions of fairness and equity into account. The recommendations range from cultural issues related to reflecting on how people and societies relate to waste to very concrete proposals for fiscal reform, EU recycling labels and minimum circular economy targets, all of which incentivize the design of repairable and reusable products.

Crucially, the volume adds to the important but sometimes overlooked discussion on the social dimension of the circular economy. The authors discuss matters related to the need to ensure fairness in the pricing of, and access to, circular economy goods and services at length. Moreover, distributional questions pertaining to the governance of a reformed and scaled-up circular economy model are brought centre stage. For instance, the historical importance of the social economy – which is governed by democratic principles and has explicit social objectives – in advancing the circular economy

5 European Commission. Circular economy action plan, pp. 4, 19.

is highlighted, and the authors argue that policymakers should continue to support these established structures instead of handing the governance of the circular economy to multinational enterprises and the platform economy. These considerations are particularly important when it comes to discussions about warranties, licensing and product design. In addition, the contributions emphasize that a transition towards the circular economy should not mean that the accessibility of products is curtailed for households with lower incomes. To take these vital issues duly into account, the recommendations highlight the importance of measures like the support of tool libraries and rental services for high-quality products.

The first chapter, by Ilaria Nicoletta Brambilla, starts exploring the aforementioned discussions by outlining some key facts and figures that highlight the necessity of the transition towards a circular economy. The chapter also addresses the definition of the concept of the circular economy and engages with both historical and current initiatives connected to the idea.

The second chapter, by Teemu Loikkanen, Heikki Huilaja, Jarno Valkonen and Veera Kinnunen, provides a critical assessment of the meaning and implications of the concept of the circular economy. The authors examine the relationship between the circular economy and waste, and they problematize the association of the circular economy with recycling and consumption choices. This association has come at the expense of broader cultural shifts relating to the role of citizens in waste avoidance and to political participation in waste-related issues.

In the third chapter, Topi Turunen moves from the more abstract conceptual discussions to concrete policies, and he provides a detailed overview of the European policy framework for the circular economy. Beyond explaining EU legislation, the chapter highlights the need for setting up a holistic governance system that encompasses waste legislation, product and design standards, safety regulations, public procurement and producer liability.

The fourth chapter, which is by Antonella Ilaria Totaro, shifts the level of analysis from policies to circular economy business practices. The chapter introduces business models that do not rely on ownership and instead focus on the sharing economy and 'products-as-a-service'. Moreover, business models that are related to repair are

discussed. The chapter concludes by providing concrete examples of circular economy business models in the clothing and household appliance sectors.

The book's fifth chapter is by Kris Bachus, and this contribution again zooms out from the practices of individual businesses to broader macroeconomic questions as it outlines the impacts that the transition towards a circular economy will have on jobs. The chapter critically unpacks projections for the positive impact on employment that have been suggested in some of the literature. Notably, the author highlights that circular economy jobs can be precarious and that potential skills mismatches will need to be addressed.

The sixth chapter sees Tim Gore following a similar route: it also foregrounds questions related to jobs. The chapter highlights the relative absence in the circular economy literature of social aspects related to issues like decent employment and the affordability of goods. The author places particular emphasis on the social economy, which has historically hosted activities that are related to recycling while providing valuable employment outside the exploitative conditions that are often found in a neoliberal market economy.

Amelia Kuch and Carsten Wachholz's contribution in the book's seventh chapter focuses on the international governance of the circular economy. Their chapter summarizes and categorizes the debates and institutions that have emerged at the international level with regards to the circular economy. Moreover, the authors explore how circular economy considerations are increasingly reflected in international trade agreements such as the EU–Vietnam agreement.

In the eighth chapter, Benoît Calatayud offers an in-depth perspective on one of the central materials and sectors related to waste and the circular economy: namely, plastics. The chapter outlines the properties and uses of plastics as well as their impacts on the environment and human health. The chapter also revisits plastics regulation and conventions at the EU and international levels. The chapter concludes by providing recommendations for improving the governance of plastics, such as the adoption of ecodesign methods and the phasing out of single-use plastics.

In the book's conclusion, Andreas Dimmelmeier synthesizes the contributions to the volume by developing a framework that

classifies the proposed measures for the transition to a circular economy according to two questions: who should take action and what should be done? The conclusion finds that the authors explore a wide variety of actors and measures ranging from the local to the global and from public investments to changes in mindsets. This variety illustrates the comprehensiveness of circular economy policies and is a reminder that policymakers need to adopt a holistic view when governing the circular economy.

In summary, the contributions to the volume paint a comprehensive picture of the academic and political discussions around the circular economy and in doing so provide valuable inputs for academics and policymakers alike. At the same time, the volume goes beyond the analysis of the circular economy debate by outlining a forward-looking perspective through focusing on both systemic and concrete policy recommendations.

What is the circular economy, and why do we need it?

By Ilaria Nicoletta Brambilla

Earth Overshoot Day is a date you have probably heard of. It marks the day when humanity's demand for ecological resources and services in a given year exceeds what the earth can regenerate in that year. According to estimates by the Global Footprint Network, the international research organization responsible for calculating Earth Overshoot Day, humanity – and countries with the strongest economies in particular – has, since 1970, done nothing but progressively erode more and more natural resources, so much so that in 2019 the date had been brought forward to 29 July. The Covid-19 pandemic, which has completely transformed our lives and looks to us like a massive shutdown, meant that in 2020 the date when we ran out of resources that we can regenerate was 22 August.[1] And the news for 2021 was not comforting: that year, Earth Overshoot Day was again on 29 July. This means that, despite the pandemic, the impact of resource use has diminished only temporarily while still far exceeding the limits of the planet.

Right now, we are using the resources of 1.6 planets, 0.6 times more than we have available. If we quantify these figures, we find immense numbers: according to Circle Economy's 'Circularity gap report', almost 100 billion tonnes of raw materials entered the world system in 2020 alone, more than three times the amount extracted in 1970, when there were 27 billion tonnes.[2] According to the 'Global material resources outlook to 2060' report from the Organisation for Economic Co-operation and Development (OECD),[3] the race

1 URL: www.overshootday.org.

2 Circle Economy. 2021. The circularity gap report. Report, Circle Economy.

3 OECD. 2019. Global material resources outlook to 2060. Report, OECD.

to consume will not stop: the global consumption of raw materials will double from 79 billion tonnes in 2011 to 167 billion tonnes in 2060 due to the expansion of many economies and the resulting rise in living standards. The effects of the intensive use of natural resources translate into wide-ranging environmental consequences: biodiversity and ecosystem loss; pollution of rivers and oceans. More than half of all greenhouse gas emissions are linked to the management and extraction of raw materials and, if its current trend is not reversed, this amount will increase to around 50 billion tonnes of CO_2 equivalent by 2060.

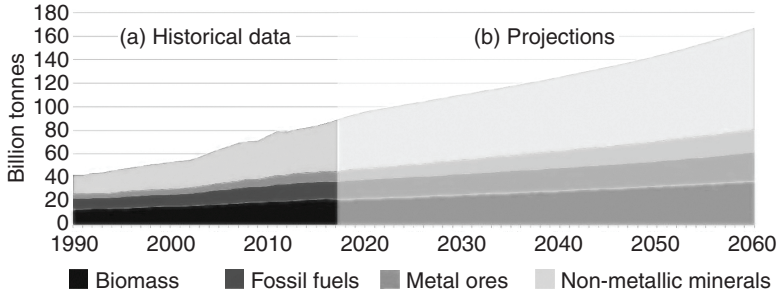

Figure 1. Raw material production. *Source:* European Commission, 'Strategic dependencies and capacities Accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions', p. 52.

What is more, waste generation across the world is expected to reach 3.4 billion tonnes by 2050, according to a World Bank study,[4] while more than 90% of biodiversity loss and water stress comes from resource extraction and processing. Finally, we should bear in mind that the extraction of specific categories of materials – such as the rare-earth metals used as components in the medical sector and the defence industry as well as in the electronic devices we use every day

4 Kaza, S., Yao, L., Bhada-Tata, P., and Van Woerden, F. 2018. *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*. Urban Development Series. Washington, DC: World Bank (https://doi.org/10.1596/978-1-4648-1329-0).

– involves issues that go beyond the environmental impact, which is immense. Most of these elements are found in China – which has one-third of the world's reserves and controls 90% of world production – followed by Vietnam, Brazil, Russia, India, Australia, Greenland and the United States. The dependence on the location of these resources is therefore very delicate and can have geopolitical consequences, as has happened in the past.

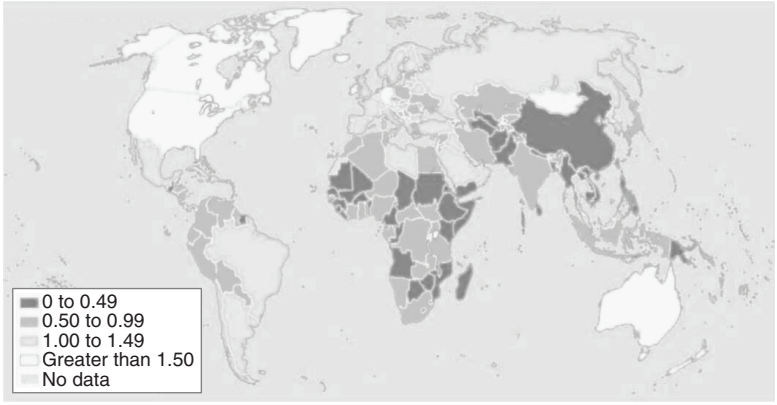

Figure 2. Waste generation per capita. *Source:* World Bank, *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*. (License: Creative Commons Attribution CC BY 3.0 IGO.)

These figures tell of a planet that is heading for an unsustainable temperature rise. Even if all signatories respect the Paris Agreement, if we continue to live and produce according to the current economy, temperatures will have risen by 3.2 °C by the end of the century.[5] We cannot postpone tackling the climate crisis any longer. We need to rethink the way we produce now.

The circular economy is a socio-economic model that overturns the linear economic paradigm that has accompanied the development of capitalism since the industrial revolution. While the latter

5 United Nations Environment Programme. 2020. Emissions gap report 2020. Report, United Nations Environment Programme, Nairobi (www.unep.org/emissions-gap-report-2020).

is based on the extraction of materials, production, distribution, consumption and waste, the circular economy envisages 'closing the circle', bringing materials considered waste back into the production cycle. But this is only the beginning.

According to the definition given by the Ellen MacArthur Foundation, the world's leading organization working to spread the word, 'A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.'[6] The European Commission defines its objectives as follows:

> A circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. The fewer products we discard, the less materials we extract, the better for our environment. This process starts at the very beginning of a product's life cycle: smart product design and production processes can help save resources, avoid inefficient waste management and create new business opportunities.[7]

Therefore, the circular economy is not the green economy, nor is it just a waste economy: it is a complex and holistic model that involves rethinking the use of resources at every point in the chain, and it consists of three fundamental principles. Firstly, the circular economy is based on the 3Rs model of 'reduce, reuse, recycle', adding the concepts of 'collecting and recovering' secondary raw materials. It is also necessary to eliminate the wasteful use of products, i.e. existing and unused material. Finally, the material's life cycle must be extended as far as possible, avoiding considering products that are broken or out of fashion as waste.

The material then becomes renewable, leading to the virtual disappearance of waste. Waste from one production chain becomes an input for another, and/or closed-loop production chains are

6 URL: www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy.

7 URL: https://ec.europa.eu/eurostat/web/circular-economy.

maintained, where an end-of-life element is reintegrated as a new secondary raw material to restart production. Products and supply chains are designed using systemic thinking, including environmental, economic, social and cultural components and constraints. A design that can adapt to possible shocks – economic, environmental, etc. – always consists of a 'plan B' and works over medium, long and very long periods. Production in which the supply chain is as geographically limited as possible reduces the scale of supply and encourages the return of secondary raw materials to the fabrication process. Last but not least, it is a socio-economic model. If we do not consider the human factor – quality of life and work – then the circular economy will fail in its mission.

Moreover, a focus on the quality of work is a crucial asset of the text that has underpinned the reflections on the circular economy over the last 45 years. The first occurrence of 'cycles economics' comes from a 1976 report for the European Commission by Walter R. Stahel and Geneviève Reday-Mulvey: 'Potential for substituting manpower for energy'. In the report, later published under the title *Jobs for Tomorrow: The Potential for Substituting Manpower for Energy*, the authors analysed resource waste associated with disposing of goods and products instead of repairing them. On the one hand, they proposed extending the life cycle of buildings and products such as cars to reduce waste. On the other, they imagined a self-regenerating system in which companies also became responsible in the aftermarket, envisaging a decentralization of jobs and skills for recycling, remanufacturing and repairing (with more skilled labour inputs) coordinated by a centralized structure to manage, research and develop new products.

But how did they come to develop a theory of the circular economy? Several factors contributed to the genesis of the concept. Firstly, it is strongly linked to the idea of long-term sustainability, i.e. the ability to regenerate resources, which has been taken into account in economic theory since the work of Thomas Robert Malthus and John Stuart Mill, albeit with different outcomes. Secondly, the impact of mass industry on the environment in the twentieth century provoked a growing sensitivity to environmental issues, starting with Rachel Carson's appeal in her 1961 book *Silent Spring*

and continuing with the spread of ecological movements. Thirdly, scientific research made clear what was now plain for all to see: the dramatic impact that the world production system has had and is having on the planet's limits.

Since then, the circular economy has pursued its theoretical and practical course, interacting with other models such as industrial metabolism, industrial symbiosis (with the example of the eco-industrial park in Kalundborg, Denmark) and industrial ecology. At times the concept has had a focus on eco-efficiency, as in the work of the Wuppertal Institute for Climate, Energy and Environment or of Amory Lovins and Lee Hunter Lovins, i.e. 'doing more with less'; at others the focus has been eco-efficacy – as in the seminal text *Cradle to Cradle* by William McDonough and Michael Braungart – understood as imitating the system of the flows of nutrients in a natural metabolism, in which the concept of waste does not exist. Further inspiration came from Janine Benyus's concept of biomimicry – which shows how, by imitating the adaptive patterns of plants, animals and ecosystems, waste can be eliminated – and from always bearing in mind that nature operates on interdependence, interconnection, cooperation and the proliferation of diversity. Finally, the circular economy has drawn on the idea that, at the end of its life cycle, material can be recycled and upcycled, i.e. treated so that it has a greater value than at its previous entry into the production system.

The circular economy is an excellent theoretical model precisely because it is adaptable to most production sectors and is generative, i.e. it allows the creation of technological, economic and social innovations from its premises. At the same time, it cannot be applied indiscriminately and universally: it cannot be considered a panacea for every systemic distortion, nor can the inevitable degradation of all matter be made to disappear in a perpetual recycling process. We need to get away from the rhetoric of the single answer – of the salvific solution – and start to cross-fertilize our policies, integrating the founding principles of the circular economy with those of the bio-economy and of the doughnut economy, engaging in the painstaking and prudent work of reinvention and experimentation, learning to live with uncertainty. There is a real possibility to rethink the strategies with which we create value, both in the business world

and in the governance of cities, regions and countries, to benefit the health of nature and of people and to improve well-being and social and economic advantages. We are aware that the most crucial change has to occur at a cultural level and that if we take away what stitches our economy together, i.e. the horizon of production-oriented functioning, the whole social organization that is linked to it is bound to fall apart and will need to be rethought.

The circular economy also brings changes to business models: we can identify five main models, which in practice can take many different forms and often overlap with each other or involve more than one company's activities (see Chapter 4 and Chapter 5 on the social impacts of these business models).

The first is the 'as a service' model, in which companies retain ownership of the product and sell its use and maintenance. In this way, they increase the use value and decrease the amount of resources and the number of finished products, reducing waste. Just as we rent flats for shelter, we can rent cars to move around when we need to, rather than leaving all the material they are composed of sitting in a car park most of the time. A well-known example of this already exists in many cities: car-sharing services, especially those that use electric cars and recharge from renewable sources, such as those of the Moveel Group's Car2Go company, owned by Daimler AG. Another use of this model is renting a drill only when we need to drill a hole in a wall by going to one of the numerous 'Libraries of Things' located in many countries worldwide. But that is not all: we can rent the services of printers (with companies like Xerox), LED light bulbs (Philips), air conditioning (Kaer) and even compressed air for industrial machinery (Tamturbo) and local food-processing plants in various parts of the world (Blendhub).

Our second business model is 'renewability'. In this model, companies use or produce renewable materials and energy resources, in both the design and product-manufacture phases. Often, at the end of a product's life or as waste from its manufacturing process, components appear that individually have a high use value and can be reintegrated into production. For example, the construction sector causes about 40% of the world's CO_2 emissions because of resource extraction, transport and processing. Companies such as

BC Materials reclaim earth-mass displaced during the construction of buildings and transform the surplus into building materials without using chemical processes, while collaborating with all stakeholders in the construction supply chain and maintaining local scale. Another sector that produces a lot of Europe's CO_2 emissions (around a tenth of the total) is agriculture; this is a result of energy-intensive fertilizer use. The company Soilfood, for example, takes the by-products from the processes of different industries in a limited geographical area – such as the wood, bioenergy, food, mining, chemical and environmental industries – and uses those materials to produce fertilizers for local agriculture.

The third business model we consider is 'product life extension'. In this model, companies work mainly on the design phase to create more resistant products with as long a lifespan as possible. In practice, this is the exact opposite of planned obsolescence: the process whereby a product is designed with a reduced lifespan to reduce the time between sales. In addition to designing products to last, extending the life cycle of a product can follow other approaches. For instance, appliances can be remanufactured at a lower price than when they were new but with the same performance (as many computer and mobile phone companies – such as Dell, Lenovo, HP, etc., and specialized companies such as Norsk Ombruk and Leapp – now do). Products that can be sold in bulk can be refilled: from food to printer inks. Another example is return and buyback, as in the case of the IKEA programme that allows for reselling certain types of used furniture to the furniture giant, which is then sold at a discount in the shop. And then there is the upgrade approach, i.e. the sale of just the extra piece or service that the product offers in the most up-to-date edition, from software to mobile phones, as in the well-known case of Fairphone. Finally, one of the most critical elements of extending the life cycle of a product is the possibility of repairing it.

Between planned obsolescence, the impossibility of accessing certain parts of products as a consumer because the design of the object prevents it, and the high cost of spare parts (so much so that it is often cheaper to buy a new product), companies have long sought to sell as many products as possible, contributing to the inexhaustible

race to extract resources and create waste. In Europe, several movements, such as the Right to Repair campaign, are active and are highlighting the consequences of the problems mentioned above. The campaign is receiving growing interest from institutions across Europe. Since March 2020 it has participated in many consultations and talked to EU policymakers to ensure the future policies about repair will be as ambitious as claimed and will not get watered down by the industry. Finally, on 9 February 2021, the European Parliament voted to establish a right to repair alongside a far-reaching set of circular economy measures in the Circular Economic Action Plan, which was presented in 2020 as part of the European Green New Deal.

Our fourth business model is 'collaborative consumption': exchange platforms make it possible to extend and enhance the life cycle and use of a product's or service's value. The application possibilities are diverse and consist mainly of reusing, sharing, renting and selling goods or services. One of the best-known examples is the holiday-home rental website AirBnB, which highlighted – despite the contradictions that arose from its popularity, such as the gentrification and touristification of entire neighbourhoods – that cities were full of unused spaces and that the construction of yet another hotel was not necessary for tourism. Another application of collaborative consumption is the food recovery app Too Good To Go. Too Good To Go is a 'B corporation' (which means a business that meets the highest standards of verified social and environmental performance, public transparency and legal accountability to balance profit and purpose) and a social impact company whose primary goal is to fight food waste by mobilizing different stakeholders. It connects consumers with surplus food provided by businesses that sell it at a discount, contributing to saving consumers' money, growing companies' profits and making an ecological gesture that impacts global food waste. There are also platforms for exchanging waste materials from one's production chains and leftovers, such as Sfridoo, where users can sell or donate their surplus.

Finally, the fifth business model is 'resource use and enhanced recycling'. This is one of the most widely used models, as it derives from efficiency strategies that have been in place for much longer and

that most companies have already been pursuing for several years. Reducing resource use, as mentioned above, is one of the main elements to be addressed if a company is to reduce emissions and meaningfully describe itself as working according to the circular economy model. Examples include making product packaging lighter, using 100% closed loops, recycled PET (r-PET) and bioplastics, as the packaging company ILIP does. In some cases, however, some propose getting to the root of the problem and avoiding packaging waste before it happens. This is the case with MiWa (which stands for Minimum Waste), a company that started a system made of different components that work together to close packaging loops. The system is suitable for industrial production, large-scale wholesalers and producers of consumer-related goods. It involves standardized, reusable, intelligent containers, filled by producers with different foods and then sold in bulk in grocery shops. It also has a modular shelf system that allows shops and producers to monitor inventory, the automatic reordering of stock and real-time data on the flow of goods, improving supply-chain efficiency and operational convenience. Furthermore, the company has created reusable, intelligent cups that are used by customers to carry home the needed quantity of food (MiWa cups store the information related to the food they contain and are later collected by MiWa to be recycled). Finally, an app that associates the user to the cups allows them to buy remotely and monitor the quantity and quality of the remaining food. Another case in point is Renewcell, which has tackled the central problem of textile waste and pollution in the fashion industry by creating a chemical recycling system that converts used cotton and viscose into new yarns of equal value. And in fashion, Spinnova produces yarn from cellulose without chemical additives, with almost zero water consumption and a raw material that is regenerated indefinitely. The raw material can come from any cellulosic biomass and can help reduce waste from various supply chains, from agriculture to forestry and textiles.

These are just a few of the countless examples of companies and start-ups that have transformed or launched their businesses by adopting one or more of the principles and models of the circular economy, and more are in the process of being created. Not only

does the circular economy make it possible to respond to ecological challenges and urgencies, but it is also a profitable business for companies. According to a report from the McKinsey Center for Business and Environment,[8] the circular economy could generate a net economic benefit of €1.8 trillion by 2030. It is possible to separate the prosperity of the economy from the use of resources and the pollution of ecosystems, as long as a systemic and ecological view is kept in mind when applying socio-economic models.

Indeed, these are the principles of the European strategy for the circular economy's ecological transition and implementation. As early as 2015, the European Commission presented a package of measures to boost the circular economy's transition and thereby strengthen the continent's competitiveness globally and foster sustainable economic development and job creation. The measures were finally approved in 2018 and included a fundamental approach to the circular economy, i.e. keeping the secondary raw materials in the production cycle as much as possible and minimizing the use of new resources. This first phase updates waste management and reduction rules, identifying higher recycling thresholds, setting five-year deadlines until 2035 and minimizing waste to landfill. Furthermore, great attention is paid to the product design phase, particularly with the Ecodesign Directive, focusing on using renewable and sustainable resources and reinforcing extended producer-responsibility systems. Green Public Procurement by public bodies is also encouraged at this stage.

In 2019, the European Commission presented a further ambitious strategic plan: the Green New Deal. This is a long-term plan to make Europe the first carbon-neutral continent by 2050. To do so, it envisages a transition to a circular and resilient economy that is both equitable and inclusive: in fact, the EU provides funding and technical support directed at the sectors that will be most affected by the transition (the Just Transition Mechanism). In 2020, Europe launched the trillion-euro-plus Next Generation EU recovery plan: a temporary tool to stimulate recovery from the economic crisis resulting from the Covid-19 pandemic. The funds, disbursed or lent

8 McKinsey Center for Business and Environment. 2015. Europe's circular economy opportunity. Report, McKinsey Center for Business and Environment.

to EU members, are tied to use in specific sectors, with 37% linked to decarbonization and actions that can promote it (such as the circular economy). Also in 2020, the European Commission adopted the new Circular Economy Action Plan, a series of concrete actions that take up the principles adopted in the previous Action Plan and detail all the essential components to foster the transition to the circular economy.

Governments have drawn up plans at a national, regional and local level and undertaken actions to bring about a circular transition in their communities. Some have set themselves targets in line with European ones; others have planned even more ambitious transformations. In particular, it seems to be emerging that the city scale may be the best choice for establishing closed and restricted cycles. This urban metabolism can best express the principles of the circular economy and allows for the combination of economic, environmental and social-inclusion needs. Circular cities plan and manage sustainable and intermodal mobility, renewable energy networks, the greater self-sufficiency of neighbourhoods, the regeneration of buildings and the food and goods systems.

One of the most famous examples of this is found in Amsterdam. The Dutch city's government has decided to adopt economist Kate Raworth's circular model – the doughnut economy – which aims to ensure that all citizens can satisfy their individual and collective needs without exceeding the ecological limits of the planet. The Dutch city's strategy – the Amsterdam City Doughnut – focuses on three leading value chains: food and organic waste streams, consumer goods, and the built environment. It has set ambitious targets of achieving 50% circular procurement by 2025, using up to 50% less primary raw materials by 2030, and being a 100% circular city by 2050. The city is experimenting with various solutions: starting with peri-urban gardens – where it is possible to grow local food and produce biomass, develop biodiversity and provide training – local compost stations and the Dutch Circular Textile Valley, where they are creating a sustainable textile supply chain and connecting with other global textile hubs; and ranging to the construction sector, where the city is committed to renovating its canals using circular construction systems (with 50% of all renovations and building

maintenance activities to follow the principles of circular construction by 2025).[9] The municipality works closely with central government and with the EU. It specifies in its strategy document that 'the shift from taxation on labour to taxation on raw materials and energy is an important prerequisite for creating a circular economy'.

Another example is the city of Milan, which has implemented the Milano Food Policy, the objectives of which are to reduce food waste, provide access to food and water for people in difficulty, and create a sustainable food system by developing the consumption of agricultural products in the peri-urban area. The heavy reliance on the separate collection of the wet fraction of food waste also allows for compost creation for local production and biomethane. In 2015, as one of the essential Expo 2015 legacies, the municipality also promoted an international agreement – the Milan Urban Food Policy Pact – that involves 211 cities worldwide: a total of more than 350 million people. The goal is 'to develop sustainable food systems that are inclusive, resilient, safe and diverse, that provide healthy and affordable food to all people in a human rights-based framework, that minimize waste and conserve biodiversity while adapting to and mitigating impacts of climate change'.[10] The project won the first international Earthshot Prize, in the Food Policy category, for the best solutions to protect the environment.

What will it take, then, to make the circular economy the standard socio-economic model for curbing climate change? First, there will need to be political commitment through finance and the implementation of nationally determined contributions (NDCs) as well an understanding among companies that transforming business-as-usual into a regenerative business brings economic benefits and increases market competitiveness, in both the short term and the long term. It also requires disclosure and transparency, reliable communication and evidence, and the involvement of all European

9 URL: https://assets.amsterdam.nl/publish/pages/867635/amsterdamcircular2020-2025_strategy.pdf.

10 Milan Urban Food Policy Pact, Article 1, 15 October 2015 (www.milanurbanfoodpolicypact.org/wp-content/uploads/2020/12/Milan-Urban-Food-Policy-Pact-EN.pdf).

citizens in making sustainable choices in their daily lives and purchases. Finally, we need absolute honesty and commitment from stakeholders to avoid greenwashing campaigns: people's trust is the most precious currency in sustainability. Losing the support of even one actor in the system in exchange for a temporary and ephemeral advantage would undermine the collaboration needed to move towards a greener future.

THREE KEY PROPOSALS

UNEP launched the Decade for Ecosystem Restoration in May 2021 – the term means assisting in recovering ecosystems that have been degraded or destroyed. This is a crucial activity because it enables and accelerates efforts to reduce resource use and carbon emissions. One proposal that could complement circular measures would be to grant tax incentives or funding for circular transition projects only if plans include restoring local ecosystems.

The ecological and climate crisis is causing a significant break with the recent past in which, at the expense of the planet, we have managed to provide better living conditions for an increasing number of people. The worldwide growth of the middle class by the end of the twenty-first century is, on the one hand, good news because it will mean a general reduction in poverty and its effects on the satisfaction of basic needs as well as a higher rate of education (especially for women) and a consequent expected reduction in the rate of population growth. On the other hand, meeting the needs of millions of people is likely to increase the demand for resources and energy consumption. The future is uncertain, and we have no past political category available to manage such a prospect, except by realigning the social issue with the economic one.

To do this, two further proposals are presented. The first is linked to a cultural paradigm shift, not just an economic one: the promotion of values that emancipate us from the industrial and productivist matrix of which we are heirs – values that separate the satisfaction of needs, not only essential ones, from the rhetoric of abundance and infinite growth. At the same time, it requires us to fight the new resistance that is manifested in delaying action against climate

change, as is well argued in the Cambridge University paper that denounces delay as 'the new denial'.[11] The proposal here is to finance extensive and locally based communication campaigns, perhaps in party circles, to spread knowledge and fight resistance to the circular transition.

The second proposal concerns funding for local governments, regions and cities. As we have seen in France with the outbreak of the *gilets jaunes* demonstrations, some policy measures aiming at more significant sustainability conflict with the lack of infrastructure and alternatives for those living in peripheral and rural areas. In order to avoid reserving the development of the circular economy only for those actors, territories and countries that can afford it, especially after the pandemic crisis, the development of projects such as those in the cities of Amsterdam or Milan needs to receive huge financing, in a widespread manner and with particular attention to the less wealthy regions of Europe that have lower waste management rates.

11 Lamb, W., Mattioli, G., Levi, S., Roberts, J., Capstick, S., Creutzig, F., Minx, I., Müller-Hansen, F., Culhane, T., and Steinberger, J. 2020. Discourses of climate delay. *Global Sustainability* 3, E17 (https://doi.org/10.1017/sus.2020.13).

The key role of waste citizenship in achieving the objectives of the circular economy

By Teemu Loikkanen, Heikki Huilaja, Jarno Valkonen and Veera Kinnunen[1]

In the last two decades, the circular economy (CE) has become the most talked-about solution model for a diverse range of problems, including environmental crises, climate change, pollution and declining biodiversity. The concept is mentioned in international politics, industrial and corporate marketing, development plans and national sustainable development programmes.[2] The fact that numerous definitions of CE have been provided in diverse contexts demonstrates its topicality.[3]

Many analyses of the concept[4] are based on the definition given by the Ellen MacArthur Foundation, by which a CE is an economy that aims to divest itself of the 'end-of-life' approach to production and goods by utilizing renewable energy and the recycling

1 This article is based on research conducted by the Waste Society (https://wastesociety.com).

2 Hobson, K. 2021. The limits of the loops: critical environmental politics and the Circular Economy. *Environmental Politics* 30(1–2), 161–179. Johansson, N., and Henriksson, M. 2020. Circular Economy running in circles? A discourse analysis of shifts in ideas of circularity in Swedish environmental policy. *Sustainable Production and Consumption* 23, 148–156. Korhonen, J., Nuur, C., Feldmann, A., and Birkie, S. E. 2018. Circular economy as an essentially contested concept. *Journal of Cleaner Production* 175, 544–552.

3 Kirchherr, J., Reiker, D., and Hekkert, M. 2017. Conceptualizing the Circular Economy: an analysis of 114 definitions. *Resources, Conservation and Recycling* 127, 221–232.

4 See, for example, Skene, K. R. 2018. Circles, spirals, pyramids and cubes: why the CE cannot work. *Sustainability Science* 13(2), 479–492.

of materials.[5] The objective is to develop a new kind of economic activity that reduces the consumption of natural resources through careful planning and the repurposing of materials. At the same time, this can reduce waste, i.e. the surplus matter left outside of the CE's cycle. On the business level, Kirchherr, Reiker and Hekkert state that the CE is evident as an ambition to improve competitiveness while relying on the principles of sustainable development. What the various definitions of CE have in common is an acceptance of the objective of economic growth, which is then tied into solutions for environmental problems.

Although it is multidimensional as a concept, the CE is always focused around the development of a resource-wise economy. The emphasis of the CE project led by the Finnish Innovation Fund (Sitra) is on decoupling economic growth from the overconsumption of natural resources:

> In a world ravaged by the climate crisis, diminishing natural resources and biodiversity loss, growth of the economy and well-being can no longer be based on the wasteful use of natural resources and on buying and owning more and more new goods.[6]

The aim, however, is not to stop or even to change consumption, but to continue it using 'smarter economic models', in which recyclable materials are efficiently used. These smart economic models are often referred to as new forms of the sharing economy, which includes the sharing, borrowing and recycling of goods and the decentralized provision of services. It often seems that the CE does not aim to reduce consumption but rather to facilitate it by reforming production methods.[7] In other words, accelerating economic growth and consumption are not seen as problems but as means by which the shift to a resource-wise CE can be achieved.

5 Ellen MacArthur Foundation. 2021. What is the circular economy? Web page, accessed 20 January 2021 (www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy).

6 Sitra. 2021. A circular economy. Web page, accessed 12 January 2021 (www.sitra.fi/en/topics/a-circular-economy/#what-is-it-about).

7 See, for example, Hobson. The limits of the loops.

In this chapter, we examine the idea of the CE by asking what kind of citizenship role it generates. We particularly investigate the connection between the CE and waste policies and management. One crucial factor in saving resources is to reconceptualize waste, such that any surplus material is viewed as a potential reusable resource. Therefore, to work, the CE requires certain waste-related attitudes and actions from citizens. Previous social science research has shown that the CE ideology emphasizes the citizen's role in the fulfilment of its objectives.[8] Consequently, the concept of 'environmental citizenship' has been raised alongside national citizenship and citizens' rights.[9] We are interested in the roles and positions of citizens in CE discourse. We analyse the actions that are expected from citizens as a part of the CE and the fulfilment of its objectives. Herein, CE discourse refers to the EU's agendas and legislation related to the CE and to waste, as well as related research. National examples are drawn mainly from the Finnish context, but we have also made use of international research on the topic.

The text begins by describing the connections between the CE and waste management: why waste (especially municipal waste) is one of the core elements of CE targets and analyses. Municipal waste makes up only a fraction of total waste masses, but it is the form of surplus that we concretely encounter in our daily lives and that strongly defines our relationship with waste. We then consider the changing nature of waste in the CE and in waste policies.

Having a political definition for waste is important because it provides an orientation for understanding what kind of waste problem we are striving to solve, at the national and individual levels, and

8 Cecere, G., Mancinelli, S., and Mazzanti, M. 2014. Waste prevention and social preferences: the role of intrinsic and extrinsic motivations. *Ecological Economics* 107, 163–76. Johansson, N., and Corvellec, H. 2018. Waste policies gone soft: an analysis of European and Swedish waste prevention plans. *Waste Management* 77, 322–332. Hobson. The limits of the loops.

9 Dobson, A. 2003. *Citizenship and the Environment*. London: Oxford University Press. Valkonen, J., and Loikkanen, T. 2020. Waste citizenship in Circular Economy: case study of waste governance in Finnish Lapland. In *Dimensions of Intra- and Intergenerational Justice in the Debates about Sustainability*, edited by S. Serafimova, pp. 150–165. Sofia: Avangard Prima.

how: are we looking to handle the waste that is generated, or do we aim to prevent it from being generated in the first place?

After this, we move on to discussing citizenship in the CE and its possible alternative formulations. Up until now, the citizenship ideal has combined the concepts of economic citizenship and recycling citizenship. From the perspective of waste prevention, we should aim for a more environmentally friendly way of life, which herein we name 'waste citizenship'.

The chapter ends with a summary and a list of suggestions for how waste prevention could be improved: the economic centricity of the CE should be dismantled and the focus should shift to environmental values; citizenship and its related expectations should be built on a concept of waste citizenship that facilitates a 'waste ethical' way of life; and the great CE narrative and its related politics should hinge on the objective of diminishing waste generation.

WASTE AND THE CIRCULAR ECONOMY

The CE idea developed into its current form due to escalating worries concerning growing waste quantities and their environmental impact. These worries are by no means new: the EU's waste management efforts and policies have cited the reduction of waste as a target since the 1970s.[10]

Naturally, attention was paid to growing quantities of waste even further back than that. For instance, the driving motivation behind the waste incineration that started in late-nineteenth-century Britain and the United States was the adverse effects of increasing waste. Industrialization, population growth and urbanization, coupled with a lack of organized waste management systems, led to accumulating waste becoming problematic. One solution to the resulting health, hygiene and spatial problems was to incinerate waste to reduce its mass.[11] In the mid-twentieth century, challenges in energy efficiency

10 Johansson and Corvellec. Waste policies gone soft.

11 Makarichi, L., Warangkana, J., and Kua-anan, T. 2018. The evolution of waste-to-energy incineration: a review. *Renewable and Sustainable Energy Reviews* 91(C), 812–821.

began to arise, and consequently waste started to be considered as raw material for energy rather than a purely adverse surplus.

Concerns over the environmental impact of waste arose after the middle of the twentieth century.[12] Industrializing society had been highly effective in hiding the liquid refuse of human life with sewage systems, but the accelerating growth of solid waste started to cause disturbing mounds and unpleasant smells. The waste was declining to stay hidden from people's everyday living environments.

The twenty-first century's CE ideals generate a very particular relationship with waste. Behind it still lies the physical quantity of waste and its accelerating growth, resulting from industrialized society's continuing aim of increasing production. The radical increase in the total amount of goods produced is reflected in calculations published in 2020 that compare the quantity of global human-made mass with so-called living biomass.[13] At the beginning of the twentieth century, human-made materials made up less than 5% of living biomass. Since then, the proportion has continuously grown, with a particularly sharp increase from the mid-twentieth century onwards. The shift has intensified in the twenty-first century, and by around 2020 human-made materials had exceeded living biomass globally.[14] The shift is partly due to processes such as the wood-processing industry and the expanding use of land for farming, causing deforestation and thereby reducing biomass. By far the greatest cause, though, has been the sheer quantity of materials generated by human activity. This includes buildings, air and road traffic networks, the results of urbanization and all the objects demanded by humans'

12 Kinnunen, V., Huilaja, H., Saariniemi, J., and Valkonen, J. 2020. Environmental concern in the waste economy: a case study of waste policy in Finnish Lapland. In *Perspectives on Waste from the Social Sciences and Humanities: Opening the Bin*, edited by R. Ek, pp. 114–135. Cambridge Scholars Publisher. Hawkins, G. 2006. *The Ethics of Waste: How We Relate to Rubbish*. Lanham: Rowman & Littlefield.

13 Elhacham, E., Ben-Uri, L., Grozovski, J., Bar-On, Y. M., and Milo, R. 2020. Global human-made mass exceeds all living biomass. *Nature* 588, 442–454.

14 Elhacham *et. al.* Global human-made mass exceeds all living biomass. Anthropomass. 2021. Web page, accessed 21 January 2021 (https://anthropomass.org).

everyday living environments and practices, whose production has required steel, copper, plastic, refined wood, glass and all other types of non-living matter refined by people.

From the perspective of management of waste in the CE, the calculations of Elhacham *et al.* are interesting because they do not account for human-made goods that have been broken or for other reasons removed from use. If all those items – so-called anthropogenic mass waste – are taken into account, the scales were already tipped in the early 2010s. Such enormous and comprehensive calculations of mass are always based on estimates, so a certain level of uncertainty and inaccuracy must be tolerated. The main point, however, is not exactly when human-made mass exceeded biomass, but the speed at which the change has taken place, and particularly its acceleration in the final decades of the twentieth century and, especially, in the twenty-first century, during which time goods production has massively diversified and expanded, with a consequent increase in the amount of discarded goods. One might ask why the EU did not consider it necessary until the 2000s to create political objectives and tools for managing the quantity of waste, even though the growth in waste and the resulting environmental impact had been noted as early as the 1970s.

In 2008, the EU came up with a novel five-step waste hierarchy that determines the order of precedence of methods to deal with waste (the Waste Framework Directive).[15] The objective of the waste hierarchy was to guide politics towards reducing the quantity of waste, increasing the use of waste for energy, and reinforcing resource-based thinking. The highest target level of the five-step hierarchy is to prevent the generation of waste. The next levels down are preparing waste for reuse and recycling. If these are impossible, waste should be recovered for energy production. Sending waste to landfill should be the very last resort. The waste hierarchy has allowed the EU to monitor developments and changes in the quantities of waste.

The changes that have taken place in the era of active waste policy (i.e. the twenty-first century) are interesting. Looking at municipal

15 European Chemicals Agency. 2008. Waste Framework Directive. Web page, accessed 10 February 2021 (https://echa.europa.eu/fi/wfd-legislation).

waste, the reduction in quantity in the EU's economic area has been very small in proportion to the total mass. According to Eurostat waste statistics, approximately 500 kilograms of municipal waste were generated per capita in EU member states in 2018.[16] This amount has remained practically constant throughout the twenty-first century. To some extent, this figure is explained by the increasing efficacy of waste management, which has been able to recover the waste generated by households and services more diversely and carefully than before.

In spite of the EU's active policymaking, however, the amount of municipal waste has not taken a clear downwards turn.[17] The main change relates to where the municipal waste actually ends up. In the early 2000s, the large majority of municipal waste – around half of it – was still ending up in landfill. Statistics for 2018 indicate that the amount of landfill waste has fallen by more than half, and that more waste ends up in material recycling or is incinerated than ends up as landfill. The proportion of waste that is composted has been rising as well, even though when measured in kilograms this option still falls behind others, including landfill.[18] The changes aimed for by the waste hierarchy have started to take place.

When speaking of waste quantities, the focus is often on municipal waste, even though the largest mass comes from industry. If the amount generated by mining is added to this, the quantity is several times higher than that of municipal waste. According to Eurostat's waste statistics for 2018, the largest waste producers in the EU are the construction and mining industries,[19] which together accounted for more than 60% of the annual waste load.[20] Municipal waste makes up just over 8%. The construction industry is the biggest generator, accounting for around 36%, although in countries with extensive

16 Eurostat. 2021. Waste statistics. Web page, accessed 11 May 2021 (https://ec.europa.eu/eurostat/databrowser/view/t2020_rt120/default/table?lang=en).

17 Kinnunen *et al.* Environmental concern in the waste economy.

18 Eurostat. Waste statistics.

19 Ibid.

20 Eurostat. 2021. Municipal waste statistics. Web page, accessed 3 February 2021 (https://ec.europa.eu/eurostat/statistics-explained/index.php/Municipal_waste_statistics#Municipal_waste_generation); Eurostat. Waste statistics.

mining – such as Bulgaria, Romania, Sweden, Finland and Greece – mineral waste makes up the biggest single load.[21] In Finland, for example, nearly 75% of all waste in 2018 came from mining. In terms of the quantity of waste produced per capita, Finland is by far the biggest producer, generating 23,000 kilograms per person compared with the EU average of approximately 5,000 kilograms.[22]

Municipal waste makes up a fairly small percentage of all waste.[23] Globally, solid municipal waste, excluding sewage, only makes up 2–3% of total waste. Emphasizing the significance of municipal waste is justified, however. Firstly, it is possible to monitor and estimate municipal waste accurately, which is necessary for assessing developments in waste quantities and flows and making comparisons within regions such as the EU. Secondly, the attitudes and processes related to waste in households are linked to larger waste accumulations. Industry produces goods and services to meet the needs of consumers; therefore, the waste and emissions generated by industry are not disconnected from citizens' consumption preferences and habits. Thirdly, the waste generated by households is the waste that we concretely encounter and whose disposal we are to some extent responsible for. Our responsibilities and attitudes in relation to waste have been formed particularly through household waste and its management.[24] Therefore, examining citizens' waste-related practices provides information on people's lifestyles, attitudes and choices in general.

21 Valkonen, J., Pyyhtinen, O., Lehtonen, T.-K., Kinnunen, V., and Huilaja, H. 2019. *Tervetuloa jäteyhteiskuntaan! Aineellisen ylijäämän kanssa eläminen*. Tampere: Vastapaino. Corvellec, H., Ek, R., Nils, J., Svingstedt, A., Zapata, P., Zapata, C., and Campos, M. 2018. Waste prevention is about effective production and thoughtful consumption – not about waste: seven lessons from the research project 'From waste management to waste prevention'. Research Report, Lund University, accessed 21 January 2021 (https://portal.research.lu.se/portal/files/64572692/From_waste_management_to_waste_prevention_Final_report_in_English_August_2018.pdf).

22 Eurostat. Municipal waste statistics.

23 Valkonen *et al*. *Tervetuloa jäteyhteiskuntaan!*, pp. 14–15.

24 Ibid., pp. 15–16.

Waste in the circular economy

One of the central objectives of the CE is to redefine the concept of waste. Historically, from the 1950s onwards, waste has been seen as a useless surplus that must be disposed of. In developed Western countries, waste management has consisted of a web of diverse disposal practices and liquidation techniques in which efforts have been made to link households as smoothly as possible to a mostly government-run waste system.

Besides being seen as useless, waste has also been seen as harmful – even disgusting. It is this understanding of waste that the CE ideology strives to change. One of the main tenets of the ideology is that one should not speak of 'waste' at all, but of materials and resources to be reused. The aim is that the surplus produced by households should no longer be seen as a problem to be managed but as the useful basis for new economic activities. Additionally, it is hoped that promoting the CE will not only reduce the generation of waste but also decrease the use of non-renewable natural resources. In its new Circular Economy Action Plan, the EU aims to turn some of its political objectives into more practical lines of action.[25] The action plan considers the durability of goods, their manufacturing process, the uses of diverse materials, and extensively boosting the efficiency of waste management to reduce waste and increase its exploitability.

Taking into account the state of the global environment, the CE's objectives are excellent – even progressive. Very probably, their fulfilment would at least slow down climate change and promote a more ecologically sustainable way of life for humanity. With regard to waste management, concrete changes have already been effected: in the form of a reduction in landfill waste, for example. However, the CE ideology has not been beyond criticism.[26] One of the major critiques of it has been directed at the economic centricity of the

25 European Commission. 2020. A new Circular Economy Action Plan: for a cleaner and more competitive Europe. COM (2020) 98, European Commission, accessed January 20, 2021 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2020:98:FIN).

26 See Hobson. The limits of the loops. Kinnunen *et al.* Environmental concern in the waste economy. Valkonen *et al. Tervetuloa jäteyhteiskuntaan!*

ideology, where economic growth understood in the traditional way is upheld as an ideal above all others. As Hobson states, speaking the language of economics repeats the operating logic of the traditional market economy and does not lead to sufficient pressure to change production and consumption such that countries would be directly obligated to implement waste-reducing improvements. This economic centricity is closely connected to the contentious role of citizens as actors in the CE. A multitude of hopes are directed at citizens being proactive, but what are the possibilities and limits of this? Does the CE primarily direct people to be active as buyers, users and disposers, but not as preventers of waste?

Next, we will critically appraise the concept of the citizen in the CE, a concept closely linked to the economy and to consumption. We also offer views on the kind of citizenship that would uphold the objective of waste prevention.

CITIZENSHIP IN THE CIRCULAR ECONOMY

The University of Lapland's Waste Society research project conducted a survey on people's waste habits and attitudes together with Finland's largest newspaper, *Helsingin Sanomat*, in 2018. The results of the survey, based on more than 9,000 responses, painted a very positive picture of Finnish citizens' relationships with sorting waste. Practically all respondents regularly sorted their waste, and more than three-quarters had at least five separate containers for different waste types at home. Respondents also considered waste to be a significant environmental problem and wanted to stop its continuous growth.

The Finnish example indicates that the importance of individuals and households in sorting and recycling waste appears to have been impressed upon citizens and is reflected in their attitudes and practices.[27] Of course, people also hope that their diligent sorting will have an effect, making their lifestyles more environmentally

27 Valkonen *et al.* 2022. Citizenship in recycling: attitudes and practices of waste. Forthcoming.

friendly and less wasteful.[28] Many have been dismayed by news of the continuing growth of waste quantities and insufficient recycling. The EU's target for 2020 was for 50% of waste to be recycled, but that is far from being met. In Finland, the figure for 2019 was 43.5% of municipal waste, compared with 47.7% for all of the EU. Many countries saw a huge increase in the recycling figure in a single year: Latvia, for example, went from 25.2% in 2018 to 41.2% in 2019. The 50% target was surpassed by Germany, Denmark, Belgium, Italy, the Netherlands, Austria, Slovenia and Switzerland: less than a third of all member states.[29] Nevertheless, the EU's recycling target percentages are increasing and, by 2025, member states should be recycling 55% of municipal waste.

The confusion experienced by citizens may be due to the great narrative of the CE.[30] By narrative, we mean the image of the waste problem and its solutions that is projected by waste policies and waste management. Examining the national waste policy in Sweden, Corvellec and Hultman have found that the aim of producing less landfill waste has been at the heart of the narrative for a long time. As a result, the focus has been on how to manage and process waste that has already been generated. At the household level, this has meant sorting waste into the appropriate places. In addition to Corvellec and Hultman's critique of this traditional way of looking only at waste that already exists, Cecere, Mancinelli and Mazzanti have pointed out that the ultimate target of the waste hierarchy – waste prevention – has been fairly invisible in the EU's waste policies, and particularly when it comes to concrete action proposals.[31] With the focus being on handling existing waste, people have got the

28 Kinnunen *et al.* Environmental concern in the waste economy, 127–129. See also Hobson. The limits of the loops, 169–171.

29 Eurostat. Waste statistics.

30 Corvellec, H., and Hultman, J. 2012. From 'less landfilling' to 'wasting less': societal narratives, socio-materiality, and organizations. *Journal of Organizational Change Management* 25(2), 297–314.

31 Cecere, G., Mancinelli, S., and Mazzanti, M. 2014. Waste prevention and social preferences: the role of intrinsic and extrinsic motivations. *Ecological Economics* 107, 163–176.

impression that sorting and recycling are desirable and sufficient actions from citizens to manage the waste problem.

Many changes have taken place in waste policy objectives, however, in the last decade. The 'less waste' narrative, as Corvellec and Hultman call it, has begun to receive more attention, e.g. in CE agendas. Similarly, the question of people's relationships with nature has increasingly brought attention to the environmental impact of human activity. The role of an individual's rights and responsibilities in environmental activities has been examined in recent decades through the theory of environmental citizenship. This theory ponders the dimensions of citizenship as part of the solution to environmental problems. Environmentally friendly lifestyle choices and proactive action to abate degradation do not spring out of thin air.[32]

Environmental citizenship widens the sphere of citizenship towards a global perspective while emphasizing the private sphere of life, including, for instance, recycling. In the context of the CE, it encourages us to question the position of citizens in fulfilling the CE's objectives. As Hobson points out, in spite of the success of the CE in areas such as increasing recycling, critical analysis is still needed on the definition of the CE citizen as a recycler, user and consumer. Based on the concept of environmental citizenship, we propose herein the concept of waste citizenship as a possible solution. While environmental citizenship can be seen as a wide philosophical concept, which consists of various objectives on how we should act towards the environment and each other, waste citizenship examines the mundane ways we produce, sort and handle our waste.[33] Waste prevention requires comprehensive changes in people's lifestyles and relationships with nature.[34] Waste citizenship emphasizes not only sorting and recycling, but also ethical action in relation to waste management.

32 Cecere, Mancinelli and Mazzanti. Waste prevention and social preferences, 163–164.

33 Valkonen and Loikkanen. Waste citizenship in Circular Economy.

34 Cecere, Mancinelli and Mazzanti. Waste prevention and social preferences, 164.

The rights of the CE citizen: economic citizenship

A large proportion of the aims as well as actions suggested in CE policies focus on making citizens' everyday choices (e.g. relating to transport, food and housing) more environmentally friendly, and citizens are therefore at the heart of the CE.[35] Citizens are guided to make choices in line with the CE's objectives in diverse ways. According to the EU's Circular Economy Action Plan,[36] the forms that this guiding should take are economic instruments (e.g. taxation measures), increasing the appeal of CE services and disseminating information so that citizens can find these services. By services, the plan means the repair, borrowing and rental of goods, as well as other uses that reduce purchases of new goods and thereby prevent waste.

Johansson and Corvellec have examined the contents, aims and means of political steering related to the CE, both in the EU and at the national and local levels in Sweden. They found that, while CE objectives are often broad and ambitious, the means that are applied – for instance, to reduce waste – are more often wishes and intentions than they are specific directives bearing economic or legal sanctions. Those means are soft policies based on the assumption of changes taking place over time: the assumption that practices supporting the CE will gradually arise of their own accord as increased awareness leads to more informed waste actions by citizens.[37] Steering people by circulating information has been found to bring about changes in waste behaviour, especially when combined with the development of practical recycling solutions,[38] but, on the other hand, information provision by itself has proven insufficient as a means to effect change. Economic steering through measures such as taxation should be

35 Cecere, Mancinelli and Mazzanti, 'Waste prevention and social preferences'; Johansson and Corvellec, 'Waste policies gone soft'; Hobson, 'The limits of the loops'.

36 European Commission. A new Circular Economy Action Plan.

37 Hobson. The limits of the loops, 166.

38 Rousta, K., Bolton, K., Lundin, M., and Da, L. 2015. Quantitative assessment of distance to collection point and improved sorting information on source separation of household waste. *Waste Management* 40, 22–30.

more extensively included in the EU's waste policies if future targets related to waste reduction and recycling are to be met.

The EU's new Circular Economy Action Plan promises a whole host of rights for citizens while also referencing consumerism. According to the plan, citizens should be guaranteed high-quality, functional and safe products that are efficient and affordable, last longer and are designed for reuse, repair and recycling. Diverse 'product as a service' models and digital solutions can enhance living standards, create innovative jobs and have other positive consequences. The plan mentions empowerment: 'Empowering consumers and providing them with cost-saving opportunities is a key building block of the sustainable product policy framework.' Consumers would be entitled to receive comprehensive information on products' lifespans, as well as on the availability of repair services, spare parts and repair manuals. Additionally, the plan aims at harmonizing waste management to make sorting easier for citizens. As the action plan states: 'The decoupling of waste generation from economic growth will require considerable effort across the whole value chain and in every home.'

The Circular Economy Action Plan provides consumer-citizens with a number of new rights, the purpose of which is to lead consumption in the direction of a CE that generates fewer emissions while producing economic development. From the perspective of waste prevention, the problem continues to be the fact that consumption is not sufficiently questioned. Acquiring new consumables increases the total quantity of goods, as well as of waste. As Gregson *et al.* have found by researching car boot sales in Britain, the reuse or recycling of goods does not reduce the amount of waste, and may even increase it.[39] Car boot sales and flea markets become trading places for cheap goods, where purchase decisions are made very swiftly and lightly thanks to low costs. Buyers do not stop to consider the necessity of the purchases very carefully, which quickly

39 Gregson, N., Crang, M., Laws, J., Fleetwood, T., and Holmes, H. 2013. Moving up the waste hierarchy: car boot sales, reuse exchange and the challenges of consumer culture to waste prevention. *Resources, Conservation and Recycling* 77, 97–107.

leads to the realization that these items were not useful after all, and they end up as waste. When, at the same time, those selling their old items replace them with new ones, the total quantity of goods in use and being disposed of grows.

The current rights-centred CE citizenship is an economic citizenship in which the citizen is primarily a consumer. This can be seen to correspond to the general objectives of the CE, which still have a focus on the economy and its growth. In this context, it is understandable that the definition of citizenship will also have an economic focus.

The responsibilities of the CE citizen: recycling citizenship

The Circular Economy Action Plan does not place citizens in a responsible role, although notably the Commission recommends linking it to the Citizens' Dialogue programme. This programme allows citizens to voice their opinions (which can also be considered a right), so it would actively involve them in the progress of CE plans. Finland's new Strategic Programme to Promote a Circular Economy tries to take citizens' proactivity and responsibility even further:

> Change requires a narrative that speaks to people, that creates a sense of belonging and makes individuals feel that their actions are meaningful and that they form part of a broader community with a shared objective. We are not just consumers; we have the ability to assume responsibility for the planet and for future generations.[40]

In other words, the example of Finland's programme illustrates that the shift to a CE aims to increase individual citizens' duties. Citizens are encouraged to assume responsibility for the entire universe, including future generations. Many other CE programmes, such as

40 Finnish Ministry of the Environment. 2021. Strategic Programme to promote a Circular Economy. Web page, accessed 11 May 2021 (https://ym.fi/en/strategic-programme-to-promote-a-circular-economy).

a similar one for the City of Amsterdam,[41] also emphasize collective responsibility, where every individual contributes their own input.

As the website for Finland's programme puts it:

> Instead of only consuming, people actively produce solutions that facilitate a change in consumption culture, emissions cuts, longer product lifespans and reductions in resource use.[42]

The objective is a significantly more active citizen: one that not simply takes part in developing solutions but actively produces them. The programme does not detail how this shift in citizenship is to be achieved or how this participation and solution-production by citizens is to occur in practice. The same objective could be expanded to the EU level, while clarifying in further detail how citizens can actively take part in coming up with solutions.

Savini and Giezen have examined the individual's role in the CE by envisioning responsibility as a field. Responsibility also plays a crucial role in discourse related to environmental citizenship.[43] The concept allows us to examine the expectations directed towards citizens in various discussions and resolutions around the CE. According to Savini and Giezen, efforts to bring about the shift to a CE are focused on collectivized responsibility; in other words, the aim is that all actors will share responsibility for the success of the actions. This ideology is repeated in many CE resolutions. Savini and Giezen examined the plans for the City of Amsterdam. Based on their analysis, CE discourse involves the process of 'co-creation': their interviewees saw the redevelopment of Amsterdam's energy, water and waste systems as a collective endeavour. When one looks more concretely at the interrelationships between various actors, e.g. businesses, the city council and citizens, the issue becomes more complex. Here, the actors return to their traditional roles: citizens are simply consumers,

41 Savini, F., and Giezen, M. 2020. Responsibility as a field: the circular economy of water, waste, and energy. *Environment and Planning C: Politics and Space* 38(5), 866–884 (https://doi.org/10.1177/2399654420907622).

42 Finnish Ministry of the Environment. Strategic Programme.

43 See, for example, Dobson. *Citizenship and the Environment*.

entitled to services by paying for them; businesses have their own part to play; while the city is only an enabler. We have come across the same contradictions in our own research. The role of citizens is strongly emphasized, but when it comes to waste, for example, it ultimately boils down to sorting waste correctly, keeping disposal places neat and avoiding excess consumption.[44] On this basis, therefore, the changing role of citizens is not sufficiently emphasized in practice in the national implementations of the Circular Economy Action Plan.

We view this kind of citizenship as a recycling citizenship, in which citizens are primarily expected to assume the traditional role they have always held in waste policies: that of sorting their own waste. The CE extends this role in the sense that citizens will be in charge of even more waste categories than before. Many CE programmes have a clear emphasis on increasing citizens' responsibility. Thus far, however, this has not been translated into concrete action. Therefore, future publications should look more closely at the citizen's position.

Waste citizenship

How, then, could citizens be given a more comprehensive role in the CE? According to the EU's waste hierarchy, the primary objective of the CE is to prevent waste from being generated. It seems, however, that the current citizenship role fails to optimally promote this. As a solution, we propose the concept of 'waste citizenship', as an alternative to economic and recycling citizenships.[45] We developed this concept based on our previously presented theory of environmental citizenship.[46] The central tenets of waste citizenship are an increase in obligations and responsibilities, an ethical approach towards waste and action by people as collectors of globally usable materials. We maintain that waste citizenship offers a conceptual tool by which the role of the citizen in the CE could be diversified. For example,

44 Valkonen and Loikkanen. Waste citizenship in Circular Economy.
45 Ibid.
46 Dobson. *Citizenship and the Environment*.

promoting ethics and political activity in waste management and proclaiming a waste-minimizing lifestyle would expand the potential of citizenship.

A closer consideration and explanation of the responsibilities, obligations and rights related to citizenship within the CE would make the individual's role in the CE easier to understand, and it would provide opportunities for supporting it using political means. Targets related to waste recycling are dependent on the activeness of citizens in sorting waste. For example, our study found that citizens can promote the expansion of recycling opportunities within housing companies: many of the respondents to the *Helsingin Sanomat* survey recalled proposals they had made, on the basis of which their housing companies had included recycling containers for plastic in their waste facilities. Citizens also came up with experimental waste practices that challenge official policies.[47]

The prevailing CE policies do not expect citizens to be politically active, which we consider to be a significant shortcoming. Previously, in a similar way, Vihersalo criticized the EU's climate policies in her article on climate citizenship in the EU. Citizens should be encouraged to take political stances and to pressure local politicians and businesses to act.[48]

How does CE citizenship align with forms of environmental policy activism, such as protesting or campaigning? The citizen's role should truly be diversified and expanded, but it must also be clarified. Future CE programmes at the EU and national levels should provide examples of the citizen's changing role: of the means that individuals have to promote the CE and waste prevention, besides sorting and recycling. The responsibility of various actors in society should also be clearly delineated in future plans.

47 Valkonen *et al*. Citizenship in recycling. Kinnunen, V. 2017. Tavarat tiellä. Sosiologinen tutkimus esinesuhteista muutossa. PhD Dissertation, University of Lapland. Rovaniemi: Lapland University Press.

48 Vihersalo, M. 2017. Climate citizenship in the EU: environmental citizenship as an analytical concept. *Environmental Politics* 26(2), 343–360 (https://doi.org/10.1080/09644016.2014.1000640).

DISCUSSION: WHAT MORE CAN BE DONE?

What aspects of citizenship in the CE should be considered if the objective of waste prevention – rather than just increased recycling – is to be fulfilled? We present three proposals: questioning economic centricity; reinforcing waste citizenship; and examining waste infrastructure as a whole.

Proposal 1: there should be alternatives to the CE's economic centricity. The impact of CE efforts is hampered by the fact that waste policies ignore consumption almost entirely. There is an aim to decouple economic growth from an increase in waste quantities, but it does not seem to encompass consumption. Therefore the policies ignore the mechanisms by which waste is generated and focus on the waste that already exists. All in all, the CE has been promoted with an emphasis on economic stability or even growth, such that recycling is always subordinate to the strength of the economy. This does not question citizens' consumption habits or the basic logic of the market economy. In fact, the effect is the opposite: it gives the final word on the mechanisms of the CE to the market, with no clear consequences for how the market chooses these mechanisms.

Proposal 2: the principles of waste citizenship should be taken into account in CE programmes. Waste is an inevitable consequence of human activity, and if the quantity of waste is to be reduced, we must bring about changes to our entire lifestyle. Waste and its related practices become visible when they are seen through the lens of waste citizenship. Citizens' obligations, rights and virtues as part of an extensive waste infrastructure crucially affect the functionality of the whole system. Citizens should have the opportunity to promote a culture of waste prevention in their daily lives, and they should be encouraged to do so through economic and informational measures.

Proposal 3: politics does not consist solely of finding solutions to problems, but also of defining problems in the first place. Politics is not just theory but practice, because defining a problem

steers the actions taken to solve it. Therefore the ideology of the EU's CE and waste policy must shift more energetically and cohesively towards the goal of generating less waste. It should steer member states to build transparent and standardized monitoring, statistics and classification systems, focusing particularly on the production and sale of goods and services. Living according to the principles of waste citizenship and making the related choices will be easier when consumers are able to compare the environmental impacts of goods being produced and how products are removed from use in ways that promote recycling.

On the basis of the three proposals above, our first recommendation is that CE policies should address the role of consumption: for example, through economic instruments such as taxation, the most waste-generating forms of consumption could be diminished. Second, we recommend that the CE's waste policy should be concentrated on the goal of producing less waste and not simply on recycling larger percentages. Third, we recommend that the position of citizens in CE policies be clarified as well as expanded.

The role of citizens in fulfilling the objectives of the CE cannot be limited to effective recycling and bolstering the economy through smart consumption. If the aim is to reduce the wasteful use of natural resources and the generation of waste, the CE's citizenship ideal must be expanded towards an environmentally ethical lifestyle viewed as a whole. This, in turn, cannot be achieved solely by providing information. Clear political decisions, as well as binding national and local steering mechanisms, are required. Additionally, citizens' everyday living environment must be built such that ethical practices related to waste and the CE are possible to carry out. For this to happen, the waste infrastructure must be examined as a whole and citizens' daily actions must be seamlessly fused into it.

The state of play and current policies

By Topi Turunen

INTRODUCTION TO CIRCULAR ECONOMY LAW AND POLICY

In recent years the circular economy (CE) transition has become an important political objective for the European Union. The main target of the Seventh Environmental Action Programme of the EU under the title 'Living well, within the limits of our planet' was to transform the EU into a CE by 2050.[1] The CE can be defined as an industrial system in which the value of products is fully utilized by means of reuse, recycling and recovery, with the value-creation mechanisms thereby decoupled from the consumption of finite resources.[2] According to the definition of the European Commission, the CE is a new economic order 'where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized … to develop a sustainable, low carbon, resource efficient and competitive economy'.[3] The financial

1 European Union. 2013. Decision 1386/2013 of the European Parliament and the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'. *Official Journal of the European Union* L354/171.

2 Ellen MacArthur Foundation. 2015. Growth within: a circular economy vision for a competitive Europe. Report, Ellen MacArthur Foundation, p. 23. Wijkman, A., and Skånberg, K. 2015. The circular economy and benefits for society: jobs and climate clear winners in an economy based on renewable energy and resource efficiency. Report, Club of Rome, p. 5.

3 European Commission. 2015. Closing the loop: an EU action plan for the Circular Economy. COM (2015) 614 final, European Commission, p. 2.

and environmental benefits of the CE transition have been praised in multiple policy documents.[4]

The Commission has laid down ambitious objectives for the circulation of materials and introduced numerous legislative initiatives supporting the transition to a CE. To achieve the CE objectives, in 2015 the Commission adopted an ambitious Circular Economy Action Plan.[5] The Action Plan included measures to help stimulate the CE transition while simultaneously boosting global competitiveness, fostering sustainable economic growth and generating new jobs. It laid down concrete actions in an Annex alongside a timeline of when the actions will be completed.[6] When the Commission adopted the European Green Deal in 2020,[7] one of its main components was a new Action Plan for the CE.[8] The two plans lay down the actions and the pace for the CE transition. Many legislative proposals have followed as a result of the plans: for example, the waste directive was amended in July 2018 according to the first Circular Economy Action Plan. Furthermore, in the second Circular Economy Action Plan the Commission committed to ensuring a swift implementation of thirty-five actions.

Although the Circular Economy Action Plans present a holistic approach to the CE transition, no clear single legislative framework exists: different CE-related provisions are divided among various substantive legal provisions within the overall EU legislative framework. It is hard (if not impossible) to conclusively define the scope of so-called CE regulation, since all legal acts that can impact material efficiency could be included in that framework. Moreover, limiting the scope of CE regulation does not serve the purpose of promoting the CE.

4 See European Commission, COM (2015) 614; Ellen MacArthur Foundation, 'Growth within'.

5 European Commission, COM (2015) 614.

6 Ibid., Annex.

7 European Commission. 2019. The European Green Deal. COM (2019) 640 final, European Commission.

8 European Commission. 2020. A new Circular Economy Action Plan: for a cleaner and more competitive Europe. COM (2020) 98 final, European Commission.

The main objectives of CE policy can be divided into smaller individual objectives. Essentially, the different substantive legal provisions tend to only address one or two of these smaller objectives. For a comprehensive CE transition, it is necessary to coordinate, balance and streamline these objectives. This chapter examines the state of play and current policies promoting a CE transition within the EU. It discusses the existing regulatory framework, some foreseeable amendments to the regulatory framework, and CE policies based on the Circular Economy Action Plans. The chapter also discusses the challenges of formulating an effective CE framework.

KEY AREAS OF CIRCULAR ECONOMY LAW AND POLICY

The EU's CE policy is well presented through the Action Plans. The first Action Plan laid down five priority areas for the CE: plastics, food waste, critical raw materials, construction and demolition, and biomass and bio-based products. Its Annex laid down dozens of concrete actions that were scheduled between 2015 and 2018. The implementation report by the Commission confirms that it has followed the planned timeline of the Action Plan and has accelerated the transition towards a CE in Europe.[9]

The second Action Plan, from 2020, aims to go further with the CE while building on the previous accomplishments. The Plan presents new initiatives to establish a product policy framework for the CE to eliminate the generation of waste. It also aims to strengthen the EU's capacity to take responsibility for generated waste. With the Action Plan the EU states that it will lead the way to a CE at the global level. The Annex of the Action Plan introduces thirty-five specific policy actions for the period of 2020–23 to promote the transition.

Some of the actions are specific legal initiatives and propositions, while others are more abstract, such as 'efforts towards reaching a

9 European Commission. 2019. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of the Circular Economy Action Plan. COM (2019) 190 final, European Commission.

global agreement on plastics'. Actions may later result in EU directives or regulations. Member states implement the directives the best way they see fit, while the EU regulations are directly applied within member states. Usually, the specific product requirements and standards are laid down in regulations in order to ensure the functioning of the internal market.[10] However, sometimes it is useful to take into account the differences between member states and allow further leeway in the achievement of the objectives: for example, the waste directive (2008/98/EC) allows for different approaches in reaching its targets.[11] In addition to binding legislative provisions, the CE can also be promoted through, for example, developing best practices, advancing certain legal interpretations and offering economic incentives to move from a linear economy to a circular one.

FROM WASTE MANAGEMENT TO A COMPREHENSIVE APPROACH

The CE regulation focuses on optimizing sustainable and efficient material cycles. Achieving a CE requires substantial changes in all stages of the material life cycle, and since there is no single regulatory regime to address the entire life cycle of a material, the provisions are laid down in the applicable substantive regulation. However, this can cause problems for the coherence of the framework. The CE-related provisions should accommodate each other and provide a comprehensive framework for promoting the CE transition. However, CE policies currently tend to emphasize the waste stage, with the commodification of waste-based materials being especially emphasized in European CE policies.

10 See, for example, European Union. 2011. Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC. *Official Journal of the European Union* L88/5, 5–43.

11 European Union. 2008. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. *Official Journal of the European Union* L312/3.

The following sections provide an overview of different regulatory aspects of the CE. These aspects are divided among different substantive regulatory frameworks, although the different frameworks are interconnected. This chapter provides a basic overview of some of the most important regulatory approaches to the CE transition.

The commodification of waste

Waste management, and especially the commodification of waste, play a central role in the achievement of a CE. Without policies enabling the commodification of waste, it is fair to say that there really cannot be any material circulation beyond the end-of-life stage. In the current economic and consumption model, the generation of waste seems inevitable, and rules on turning this waste into useful materials and products are fundamental.

The starting point of EU waste legislation is that all materials are either waste or non-waste. According to Article 3(1) of the waste directive, 'waste' means any substance or object that the holder discards or intends or is required to discard.[12] Essentially, the waste directive is applied to substances and objects that fall under the definition laid down in Article 3(1). Non-waste materials fall under the scope of application of the relevant product legislation, standards and other technical requirements. The holder of 'waste' is required to carry out adequate waste management: either recovery or disposal. In the CE, recovery (e.g. recycling) is of course preferred. However, in order to manufacture new products out of waste, the waste must first cease to be waste (a step known as 'end-of-waste'). After ceasing to be waste, the materials fall under the scope of the relevant product legislation, like other non-waste materials.

In the waste directive there are two exclusions from the concept of waste. Firstly, according to Article 5, a substance or object resulting from a production process, the primary aim of which is not the

12 Discarding waste can be intentional or unintentional (C-252/05 *Thames Water Utilities,* ECLI:EU:C:2007:276, para. 28) and voluntary or involuntary, or it can even happen without the knowledge of the holder (C-1/03 *van de Walle*, ECLI:EU:C:2006:81, paras 46 et seqq.).

production of that item, may be regarded not as being waste but as being a by-product. Secondly, according to Article 6, waste that has undergone a recycling or other recovery operation can be considered to have ceased to be waste. Articles 5 and 6 lay down criteria for both situations. There are small differences in the criteria but, essentially, they boil down to assessing whether the further use of the material or the purpose of its use can be ensured; whether its use is lawful in the framework of the applicable product, environmental and health protection requirements; and whether its use does not cause adverse impacts to the environment or human health. The difference between the two is that by-products are produced as an unintended part of the main production process and are not waste to begin with, whereas end-of-waste materials are initially waste and then cease to be waste after recovery. Therefore, the application of the two sets of criteria occurs in different stages of the product's life cycle.

The application of the end-of-waste criteria in particular has received heavy criticism for its inconsistency and unpredictability.[13] In the second Circular Economy Action Plan, the Commission set an objective to further examine the development of new EU-wide end-of-waste and by-product criteria during 2021.[14] The development of EU-wide rules on the exclusions would surely aid the commodification of waste. In recent years, the EU has been hesitant to adopt EU-wide regulation on end-of-waste or by-product criteria.[15] The

13 European Commission. 2018. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions on the implementation of the circular economy package: options to address the interface between chemical, product and waste legislation. COM (2018) 32 final, European Commission. Turunen, T., Suvantola, L., and Romppanen, S. 2021. Well defined is half solved? The regulatory barriers for circular economy business. *Environmental Law Journal* 2021(1).

14 European Commission. COM (2020) 98, Annex.

15 Council Regulation (EU) 333/2011 on iron, steel and aluminium scrap; Commission Regulation (EU) 1179/2012 on glass cullet. Commission Regulation (EU) 715/2013 on copper scrap. Regulation (EU) 2019/1009 on EU fertilizing products also regulates on the end-of-waste status of certain waste-based fertilizing products.

2018 amendment (2018/851/EU) to the waste directive also aimed to support the interpretation of the end-of-waste criteria.[16]

Extended producer responsibility

Another legal system within the EU waste policy framework that is especially relevant for the CE is 'extended producer responsibility' (EPR). The EPR system refers to the idea of shifting the responsibility (administratively, financially or operationally) for the waste management of certain product groups from the public sector to private producers. In the EU, EPR schemes are mandatory in the WEEE,[17] battery[18] and end-of-life vehicles[19] directives. Moreover, the packaging directive indirectly invokes EPR schemes by requiring member states to take necessary measures to ensure that systems are set up for the collection and recycling of packaging waste.[20] However, in the amendment to the packaging directive it is required that member states ensure that, by 31 December 2024, EPR schemes are established for all packaging.[21] Member states have also enacted EPR schemes for tyres, waste oil, paper and card, construction and demolition waste, etc.

16 European Union. 2018. Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste. *Official Journal of the European Union* L150/109, 109–140.

17 European Union. 2012. Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE). *Official Journal of the European Union* L197, 38–71.

18 European Union. 2006. Directive 2006/66/EC of the European Parliament and of the Council on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. *Official Journal of the European Union* L266, 1–14.

19 European Union. 2000. Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles. *Official Journal of the European Union* L269, 34–43.

20 European Union. 1994. European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste. *Official Journal of the European Union* L365, 10–23.

21 European Union. 2018. Directive (EU) 2018/852 of the European Parliament and of the Council amending Directive 94/62/EC on packaging and packaging waste. *Official Journal of the European Union* L150, 141–154.

In theory, EPR schemes should encourage producers to take environmental considerations into account during the design and manufacturing phases of a product's life cycle. However, it has been hard to verify whether this has actually happened.[22] Better measuring and monitoring of the real impacts of the EPR schemes would function as tools to verify whether the schemes actually also affect the earlier phases of a product's life cycle. It is often argued that EPR schemes mainly serve the purpose of allocating financial responsibilities for waste management.[23] However, the logic behind the initial objective seems justified, and the further development of EPR schemes carried out in the right way could trigger the intended changes to the earlier phases of product life cycles. In the 2018 amendment to the waste directive, certain changes were made to the rules of the EPR schemes regarding the allocation of financial and other responsibilities as well as reporting. In addition, the amended directive requires a separate collection scheme for textile waste by 2025. This could be a stepping stone for the development of national EPR schemes for textiles in member states.

The second Circular Economy Action Plan lays down objectives to further develop regulation on certain waste streams. Firstly, it promises a proposal for a new regulatory framework for batteries (which has already resulted in a proposal for new regulation for batteries and waste batteries that would repeal the battery directive[24]) and a review of the rules on end-of-life vehicles as well as a review to reinforce the essential requirements for packaging and to

22 See, for example, Van Rossem, C. 2008. Individual producer responsibility in the WEEE directive: from theory to practice. Doctoral dissertation, Lund University. Mayers, K., Peagam, R., France, C., Basson, L., and Clift, R. 2011. Redesigning the camel: the European WEEE Directive. *Industrial Ecology* 15. Mayers, K., Lifset, R., Bodenhoefer, K., and Van Wassenhove, L. N. 2013. Implementing individual producer responsibility for waste electrical and electronic equipment through improved financing. *Industrial Ecology* 17.

23 Micheaux, H., and Aggeri, F. 2021. Eco-modulation as a driver for eco-design: a dynamic view of the French collective EPR scheme. *Journal of Cleaner Production* 289, 1.

24 European Commission. 2020. 2020/353 (COD): Proposal for a Regulation of the European Parliament and of the Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020. COM(2020) 798/3, European Commission.

reduce (over)packaging and packaging waste. Additionally, a mandatory requirement regarding recycled plastic content and plastic waste reduction measures for certain products is presented in the Action Plan.[25]

Product safety and harmful substances

Clean and safe material cycles are of fundamental importance for a functioning CE. In early 2018 the Commission published the so-called interface communication, in which it addressed some of the problems regarding the legal interface between product, chemicals and waste legislation and policies.[26] The main problem of this interface seems to be the separation of the legal frameworks: waste is regulated as one domain, whereas chemical safety and harmful substances are regulated as another. In relation to the commodification of waste, this can lead to a situation where the chemical risks of waste-based materials are unknown and therefore cannot be governed under the relevant product and chemical safety legislation.

Perhaps the most relevant chemicals regulations at the EU level are the REACH Regulation, the CLP Regulation and the POP Regulation. The REACH Regulation deals with the identification, registration, authorization and restriction of chemical substances.[27] The CLP Regulation deals with the classification, labelling and

25 European Commission, COM (2020) 98, Annex.

26 European Commission, COM (2018) 32. See also European Commission. 2018. Commission Staff Working Document Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions on the implementation of the circular economy package: options to address the interface between chemical, product and waste legislation. SWD (2018) 20 final, European Commission.

27 European Union. 2006. Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. *Official Journal of the European Union* L396, 1–849.

packaging of chemical substances.[28] The POP Regulation is applied to persistent organic pollutants that are supposed to be phased out from the material cycles.[29] On top of those, there are other chemicals provisions such as the RoHS directive, governing the use of hazardous substances in electronic appliances.[30] The roles of REACH and POP restrictions in particular have been discussed with regards to the CE.[31]

The amended waste directive laid down the first efforts to address the problem of separating the legal frameworks for waste and chemicals. The new Article 9(1)(i) states that companies supplying articles containing substances of very high concern (SVHCs) as regulated in the REACH Regulation in a concentration above 0.1% weight-by-weight on the EU market have to submit information on these articles to the European Chemicals Agency (ECHA). This data is collected in the ECHA's SCIP database. The aim of the database is to provide waste management operators access to data on harmful substances contained in waste materials.

The second Circular Economy Action Plan also takes steps towards addressing the issues regarding chemicals management and the CE. The Plan suggests a review of the RoHS Directive and guidance to clarify its links with REACH and ecodesign requirements. Additionally, it aims to develop methodologies to track and

28 European Union. 2008. Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. *Official Journal of the European Union* L353, 1–1355.

29 European Union. 2019. Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants. *Official Journal of the European Union* L169, 45–77.

30 European Union. 2011. Directive 2011/65/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment. *Official Journal of the European Union* L174, 88–110.

31 European Commission, COM (2018) 32. See also European Commission, SWD (2018) 20; Alaranta, J., and Turunen, T. 2021. How to reach a safe circular economy? Perspectives on reconciling the waste, product and chemicals regulation. *Journal of Environmental Law* 33(1), 1–24.

minimize the presence of substances of concern in recycled materials. It also pursues harmonized information systems for the presence of substances of concern. The Action Plan provides certain preconditions (methodologies for tracking, etc.) for safe material cycles but does not directly impose a set of legislative obligations. Of course, in the long run these methodologies can play a crucial role in developing that legislation.[32] Subsequent to the Circular Economy Action Plan the EU has also enacted a new chemicals strategy for sustainability that takes a more in-depth approach to creating a toxic-free environment.[33]

Product ecodesign

It has been argued that 80% of the environmental impact of a product's life cycle is decided in the design phase.[34] Therefore, policies affecting product design are extremely relevant for the CE. In the EU, product design is regulated under the ecodesign framework, consisting of the Ecodesign Directive (2009/125/EC)[35] and product-specific regulations. The possibility of promoting the CE through the ecodesign framework – for example, by requiring minimum standards regarding durability, repairability and recyclability from products – has been discussed at the EU level.[36] Nevertheless, the current regulatory framework for ecodesign does not directly advance the transition to a CE but is focused on the energy consumption of energy-intensive products such as refrigerators, washing machines and televisions.

32 European Commission. COM (2020) 98, Annex.

33 European Commission. 2020. Chemicals strategy for sustainability: towards a toxic-free environment. COM (2020) 667 final, European Commission.

34 See, for example, European Commission. 2016. Communication from the Commission: Ecodesign Working Plan 2016–2019. COM (2016) 773 final, European Commission.

35 European Union. Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products. *Official Journal of the European Union*, L285, 10–35.

36 European Commission. COM (2016) 773.

The Ecodesign Directive lays down the basic ecodesign requirements, and they are specified later on in technical product-specific regulations. These regulations set out the minimum performance standards for a certain product: if the product does not fulfil them, it cannot be placed on the market within the EU. Current products with lower performance levels will eventually be phased out from the market. Hence, the policies regarding ecodesign are not only relevant to environmental protection but also to competition and markets. To ensure the free movement of goods, regulating stricter national requirements is forbidden.

Although the current requirements are mostly focused on products' energy consumption, the ecodesign framework enables setting out requirements for different kinds of environmental impacts as well. The Commission's Circular Economy Action Plan lays down two actions concerning CE aspects in ecodesign: firstly, a legislative proposal for a sustainable product policy initiative, and secondly, legislative and non-legislative measures establishing a new 'right to repair' requirement within the ecodesign framework.[37] The product policy initiative aims to widen the scope of the ecodesign framework beyond energy-related products and, where necessary, enact broader complementary legislative proposals to establish sustainability-related aspects in EU product policy and legislation. The initiative is expected to be launched in spring of 2022.

Including CE aspects in the ecodesign framework is currently in its planning stage. Even if CE requirements were to be included in the framework and in product-specific regulation, their impact would not be immediate. Drafting product-specific requirements takes approximately five years, after which there is a transition period before the full enactment of the new requirements.[38] Moreover, the longer the life cycle of the product, the longer it will take for the

37 European Commission. COM (2020) 98, Annex.

38 Dalhammar, C. 2014. Promoting energy and resource efficiency through the Ecodesign directive. *Scandinavian Studies in Law* (59), 147–179. Dalhammar, C., Machacek, E., Bundgaard, A., Overgaard Zacho, K., and Remmen, A. 2014. Addressing resource efficiency through the Ecodesign Directive: a review of opportunities and barriers. Report, TemaNord 2014:511, Nordic Council of Ministers, Copenhagen.

products complying with the new performance standards to replace the products currently in use.

Public procurement

The role of public procurement in the CE could be significant. Firstly, a high volume of public procurement could substantially increase the intake of CE products and services. Secondly, the public sector often wants to establish its position in the forefront of the CE transition by making circular procurements.[39] Lacking its own legal terminology, circular procurement can refer to many different kinds of procurement: for example, it could mean purchasing recycled materials instead of virgin raw materials, or purchasing a service instead of a product. The EU regulates public procurement through the Directive on Public Procurements (2014/24/EU).[40] The directive includes no references to the CE. However, the framework enables so-called Green Public Procurement, where the environmental factors of the procurement are given weight in the procurement process.[41] For example, Green Public Procurement can mean buying products that are made out of recycled materials, products that are more energy efficient, or buying a product as a service. Despite this, the price of the procurement is often a significant factor in the procurement process. The second Circular Economy Action Plan lays down an action to emphasize the environmental considerations in public procurement. It promises mandatory Green Public Procurement criteria and targets in sectoral legislation and the phasing-in of mandatory reporting on Green Public Procurement.[42] A mandatory set of criteria would effectively enforce the significance of environmental considerations in the procurement process.

39 REBus. 2017. Harnessing procurement to deliver circular economy benefits. Report, REBus, p. 5.

40 European Union. 2014. Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC. *Official Journal of the European Union* 94, 65–242.

41 See, for example. C-513/99 *Concordia Bus Finland* ECLI:EU:C:2002:495.

42 European Commission. COM (2020) 98, Annex.

The circular economy and industrial pollution

The connection between industrial pollution and CE objectives has also been discussed in the EU.[43] In the EU, industrial pollution is regulated under the Industrial Emissions Directive (IED) (2010/75/EU).[44] The discussion is mostly related to the Best Available Techniques (BAT) principle and BREF (BAT Reference) documents. The BREFs provide descriptions of a wide range of industrial processes and their respective operating conditions and emission rates. Essentially, the BREFs provide rules and standards for the functioning of an industrial installation. The traditional scope of the IED and the BREFs covers a single industrial installation from gate to gate, whereas the promotion of the CE would require a wider consideration of the product's life cycle. Despite this, the IED could offer support to the CE objectives.

The scope of CE legislation covers a large amount of substantive legislation. Therefore, it seems reasonable that, in order to avoid creating too complicated a framework, the policies on industrial pollution should not aim at addressing all CE objectives. The scope of the current IED and BREF framework cannot be extended to address the whole life cycle of a product. Nonetheless, to promote CE objectives they could include references to other legislation and set specific targets considered as BAT.[45]

The second Circular Economy Action Plan lays down two actions to promote the CE through industrial pollution legislation. The first is a review of the IED, including the integration of CE practices in upcoming BREFs; nevertheless, it is rather unclear at this point

43 DG Environment. 2018. IED Contribution to the circular economy. Service Request 13 under Framework Contract ENV.C.4/FRA/2015/0042. Final report for European Commission, DG Environment.

44 European Union. 2010. Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control). *Official Journal of the European Union* L334, 17–119.

45 For more precise conclusions see Dahlbo, H., Vähä, E., Turunen, T., Forsius, K., Jouttijärvi, T., Järvinen, E., Månsson, A., Kalisz, M., Leuthold, S., and Kupits, K. 2021. Promoting non-toxic material cycles in the BREF process, HAZBREF-project Activity 4.4 report. Reports of the Finnish Environment Institute 24/2021.

what this will involve. The Action Plan also promises to launch an industry-led industrial symbiosis reporting and certification system.[46]

The circular economy and plastics

Although plastics are not purely a CE matter, they are often discussed within the same context. The EU's plastics policies are not compiled under a single regulatory framework. Moreover, plastics are a relatively new regulatory subject and therefore there is not a lot of regulation in force regarding plastic materials and products. The EU plastics strategy from 2018 took the first comprehensive approach towards plastics within the EU.[47] The strategy addressed the problems of single-use plastics (SUPs), microplastics and plastics recovery.

The first regulatory action to address the problem of plastics within the EU was the SUP Directive (2019/904/EU).[48] This directive laid down multiple different measures applied to different products to reduce the problem of SUPs. It banned SUPs where sustainable alternatives are easily available and affordable. This ban applies to cotton bud sticks, cutlery, plates, straws, stirrers and sticks for balloons, as well as cups and food and beverage containers made from expanded polystyrene.[49] For other SUPs, the directive laid down provisions on awareness-raising measures, introducing design requirements, labelling requirements, waste management and clean-up obligations for producers, including EPR schemes. The directive also set specific collection targets for plastic bottles: a 77% separate-collection target for 2025, increasing to 90% by 2029, as well as a target for PET beverage bottles to consist of 25% recycled plastic from 2025 and for all plastic beverage bottles to consist of 30% recycled plastic from 2030.

46 European Commission. COM (2020) 98, Annex.

47 European Commission. 2018. A European strategy for plastics in a circular economy. COM (2018) 28 final, European Commission.

48 European Union. 2019. Directive (EU) 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment. *Official Journal of the European Union* L155, 1–19.

49 These product groups represented the ten most commonly found SUPs on European beaches, alongside fishing gear, comprising 70% of all marine litter in the EU.

The member states are currently implementing the directive. The implementation has run into some difficulties because the basic concepts of the directive are still rather loosely defined.[50] Member states are waiting for the Commission's interpretation of the key concepts. The Commission is also expected to clarify the position of the chemical recovery of plastics within the context of the definitions of waste legislation.

The second Circular Economy Action Plan sets out three actions to address the problem of plastics on top of the already enacted SUP Directive. Firstly, the problem of microplastics will be addressed through a restriction on intentionally added microplastics and measures on the unintentional release of microplastics. Secondly, a policy framework will be laid down for bio-based plastics and biodegradable or compostable plastics. Lastly, the Action Plan promises an initiative to substitute single-use packaging, tableware and cutlery with reusable products in food services.[51]

WHAT IS NEXT?

The CE transition is well under way. Looking at the pace of the first Action Plan, we can be fairly certain that the second Action Plan will be carried out in the next few years. Nonetheless, even after the enactment and implementation of all the actions of the second Plan, the shift from a linear economy will not be complete. Certain actions of the Plan are still facilitative and only lay down the groundwork for the policies that are necessary for the CE transition. After carrying out these actions, perhaps a third EU Circular Economy Action Plan will be needed. The current EU framework does not really address the problems of the interface between waste, product and chemicals regulation. Moreover, the current regulatory framework often only focuses on a single part of a product or material's life cycle instead of looking at the materials and products all the way from the design phase to the waste management stage and back again.

50 See, for example, www.sulapac.com/blog/the-problem-with-sup-directive (accessed 15 April 2021).

51 European Commission. COM (2020) 98, Annex.

The fragmented nature of the EU's CE policies calls for a holistic approach. The legislation currently in force focuses heavily on the commodification of waste. It stands to reason that this is given special attention since the current regulatory system is founded on the separation of waste and non-waste. Hence, rules for ceasing to be waste are particularly significant for closing the material loop. However, the second Circular Economy Action Plan puts more emphasis on CE product policies. Including CE aspects in the ecodesign framework could especially promote CE objectives. The wider approach of the product policy initiative will play a big part here. Nonetheless, shifting to a comprehensive legal system that takes into account the whole life cycle of the product will require significant structural changes in the EU legal framework. Therefore, it is unrealistic to expect that this would happen in the near future.

The EU often provides only the policy framework for the CE, with member states being responsible for implementing the policies and putting them into practice. Member states may have different solutions, problems and advantages in achieving the CE objectives. Also, member states can be in very different stages in achieving the CE. Due to this, many member states are still struggling to reach the EU recovery targets for different waste streams.[52] Member states should aim to learn from each other, e.g. by sharing CE best practices and regulatory models. Alongside this, the importance of EU coordination should not be forgotten: CE objectives are often linked to economic development and are relevant, for example, to the development of the internal market. The EU should set mandatory minimum CE targets as well as create incentives for member states who wish to go further and lead the way in the CE transition.

52 See European Commission. 2018. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of EU waste legislation, including the early warning report for member states at risk of missing the 2020 preparation for re-use/recycling target on municipal waste. COM (2018) 656 final, European Commission, p. 2. Out of all Member States, fourteen have been identified as at risk of missing the 2020 recovery target of 50% for municipal waste: Bulgaria, Croatia, Cyprus, Estonia, Finland, Greece, Hungary, Latvia, Malta, Poland, Portugal, Romania, Slovakia and Spain.

Table 1. Key actions proposed in the EU's second Circular Economy Action Plan.

Substantive legislative framework	Action/planned date	Action/planned date	Action/planned date	Action/planned date
Waste legislation	Scoping the development of further EU-wide end-of-waste and by-product criteria (2021)	Waste reduction targets for specific streams and other measures on waste prevention (2022)	EU-wide harmonized model for separate collection of waste and labelling to facilitate separate collection (2022)	Revision of the rules on waste shipments (2021)
Extended producer responsibility	Proposal for a new regulatory framework for batteries (2020)	Review of the rules on end-of-life vehicles (2021)	Review to reinforce the essential requirements for packaging and reduce (over)packaging and packaging waste (2021)	
Product safety and harmful substances	Review of the Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment and guidance to clarify its links with REACH and ecodesign requirements (2021)	Methodologies to track and minimize the presence of substances of concern in recycled materials and articles made thereof (2021)	Harmonized information systems for the presence of substances of concern (2021)	
Ecodesign	Legislative proposal for a sustainable product policy initiative (2021)	Legislative and nonlegislative measures establishing a new 'right to repair' (2021)		

Table 1. Continued.

Substantive legislative framework	Action/planned date	Action/planned date	Action/planned date	Action/planned date
Green Public Procurement	Mandatory Green Public Procurement (GPP) criteria and targets in sectoral legislation and phasing-in mandatory reporting on GPP (as of 2021)			
Industrial pollution	Review of the Industrial Emissions Directive, including the integration of circular economy practices in upcoming Best Available Techniques reference documents (as of 2021)	Launch of an industry-led industrial symbiosis reporting and certification system (2022)		
Plastics	Mandatory requirements on recycled plastic content and plastic waste reduction measures for key products such as packaging, construction materials and vehicles (2021/2022)	Restriction of intentionally added microplastics and measures on unintentional release of microplastics (2021)	Policy framework for bio-based plastics and biodegradable or compostable plastics (2021)	Initiative to substitute single-use packaging, tableware and cutlery by reusable products in food services (2021)
Strategies	EU Strategy for Textiles (2021)	Strategy for a Sustainable Built Environment (2021)		
Other	Legislative proposal empowering consumers in the green transition (2020)	Legislative proposal on substantiating green claims (2020)	Circular Electronics Initiative, common charger solution, and reward systems to return old devices (2020/2021)	Updating the Circular Economy Monitoring Framework to reflect new policy priorities and develop further indicators on resource use, including consumption and material footprints (2021)

Circular business models and behaviours to reduce inequality

By Antonella Ilaria Totaro

PRESERVING VALUE THROUGH CIRCULAR BUSINESS MODELS

The modern consumer linear economy has a fundamental flaw, which promotes unsustainable consumption: the more companies make and sell, the more they earn. The more materials and products that are in circulation, the more money the companies make. This has led to planned obsolescence, a decrease in product lifespans and an increase in resource usage.

The current production and consumption models are not sustainable for people, companies, the environment or the planet. It is necessary to rethink the models and the role of companies, which until now have been able to take advantage of the market without being accountable for the negative externalities of their actions.

Circular business models are very promising in that they would create a more equal and sustainable society. The models that enable circular economy strategies include the reuse, repair, refurbishment, repurposing and remanufacture of end-of-life or redundant products, as well as including any type of asset that is used through product-as-a-service and sharing models based on leasing, pay-per-use, subscription or deposit return schemes (see the chapter titled 'Labour rights and inclusion: towards a social-circular economy' on the social impacts of these business models).

While linear business models downgrade the value of materials and products after use, circular business models tend to preserve

this value at the highest possible state.[1] The preservation of value is made possible through the take-back system for used products[2] and through circular strategies for their life-extension, such as remanufacturing or repair. A good number of studies in the circular economy sector have focused on circular business models, which can facilitate corporate innovation towards sustainability and, at the same time, create a competitive advantage.[3] Some researchers have connected these business models with the value of materials and the problem of keeping that value in circulation for as long as possible.

Beyond ownership

The value created by the use of a service is central in the circular economy. Tukker suggested the product-as-a-service (PaaS) business model as being the most disruptive: impactful in the transition to the circular economy and beneficial for clients, companies and their use of materials and energy.[4]

In the PaaS model, companies keep the ownership of and responsibility for the products they introduce into the market – whether those products are built to last or not, easy to repair or not; this model could therefore be a way to encourage companies to take responsibility and offer a more sustainable alternative to a society of overexploitation of resources.[5]

According to the Swiss engineer Walter Stahel, who in 1982 was the first to theorize the performance economy (PE):

1 Velte, C., and Steinhilper, R. 2016. Complexity in a circular economy: a need for rethinking complexity management strategies. *Conference: World Congress on Engineering 2016*, volume 2.

2 Lewandowski, M. 2016. Designing the business models for circular economy: towards the conceptual framework. *Sustainability* 8(1), 43.

3 Bocken, N., Short, S., Rana, P., and Evans, S. 2014. A literature and practice review to develop Sustainable Business Model Archetypes. *Journal of Cleaner Production* 65, 42–56.

4 Tukker, A. 2004. Eight types of product-service system: eight ways to sustainability? *Business Strategy and the Environment* 13(4), 246–260.

5 Rau, T., and Oberhuber, S. 2016. *Material Matters*. Bertram + de Leeuw Uitgevers BV.

> The PE, selling goods and molecules as a service, function guarantees or results and performance, is the most sustainable business model of the Circular Industrial Economy because it internalises the costs of product liability, risk and waste, and thus constitutes a strong financial incentive to prevent losses and waste. The PE is highly profitable because it maximises the profit potential by exploiting sufficiency, efficiency and systems solutions. Maintaining ownership of objects and embodied resources creates corporate and national resource security at low cost… If producers retain the ownership of their goods, the goods of today are tomorrow's resources at yesteryear's commodity prices… The PE redefines the role of the supply side, but also implies a radical change of the demand side, from owner-ship to user-ship of objects.[6]

In shifting to PaaS, companies have an interest in keeping products up and running for as long as possible. At the same time, they need to redesign their products, their cash flow models, their logistics and their relationship with the consumer. The transition in business models also includes a change in existing consumption models, which are no longer adequate because of their environmental load and their social inequality, two clear indicators of the inefficiency of current resource use.

With PaaS, people – or companies – do not pay the full price of the product, nor are they asked for money upfront for the purchase: they pay a monthly fee or a usage fee each time they use the product. Everybody could get access to high-quality items without being forced to buy the cheapest – or the average – option on the market for the product they are in need of. This could positively impact the environment and society, as high-quality products are often also energy efficient.

This model, based on giving up ownership, has great potential, but it also has barriers,[7] such as concerns about insurance, trust and the

6 Stahel W. 2018. *The Circular Economy: A User's Guide*, p. 37. Routledge.

7 Hazée, S., Delcourt, C., and Van Vaerenbergh, Y. 2017. Burdens of access: understanding customer barriers and barrier-attenuating practices in access-based services. *Journal of Service Research* 20(4), 441–456.

responsiveness of the company[8] or about the scepticism of consumers around hygiene and the risk of infection, as well as other health and safety issues. Research shows that consumers are often uncertain about the rules in the event of the leased or rented product breaking or becoming damaged.[9] On a social level the challenge is huge: how to attract people that would benefit the most from the model when the price of some services or their geographical reach often cuts out people with low incomes or who are living in peripheral areas. The benefits are clear too: if a greater number of low-income households were able to access high-quality appliances through a pay-per-use model, they would save money through the reduced energy costs associated with a more efficient and high-quality product. In Flanders it is common to find old freezers that consume 1,250 kWh per year – efficient options use 250 kWh per year – and this results in annual electricity bills around €300 higher per appliance.[10] Energy bills are actually one of the main elements contributing to the so-called poverty premium.[11] For the environment, the wider use of pay-per-use and similar models would mean lower greenhouse gas emissions. The benefits would be felt not only in energy use, but for water too: according to Bosch, washing machines with the automatic

8 Catulli, M. 2012. What uncertainty? Further insight into why consumers might be distrustful of product service systems. *Journal of Manufacturing Technology Management* 23(6), 780–793.

9 Gullstrand Edbring, E., Lehner, M., and Mont, O. 2016. Exploring consumer attitudes to alternative models of consumption: motivations and barriers. *Journal of Cleaner Production* 123, 5–15.

10 Bouzarovski, S., and Thomson, H. 2019. Addressing energy poverty in the European Union: state of play and action. Report, EU Energy Poverty Observatory.

11 The term 'poverty premium' is the notion that the 'poor pay more' for essential goods and services. Created by the American sociologist David Caplovitz in 1963, it is used to describe the phenomenon of poor people tending to pay more for essential goods and services because they lack the consumer options that people with medium and high incomes have. (Caplovitz, D. 1967. *The Poor Pay More: Consumer Practices of Low-Income Families.* New York Free Press.)

washing system i-DOS save up to 7,062 litres of water and 33% of detergent per year.[12]

Companies, on the other hand, whether they are producers or service providers, keep the ownership of the product and the responsibility for the materials of which the product is made. Thus, in a materials-scarce economy, and looking at the supply flow, companies with a long-term mindset producing high-quality products will in five, ten or fifteen years have quality materials flowing back into their supply chain. For companies, putting high-quality, easy to repair, easy to disassemble products into the market is also a resilience strategy that could ensure them a long existence. Companies with a steady material supply chain will have great competitive advantages, such as a predictable supply of materials like cobalt or rare-earth elements, for which other companies could soon struggle. A system in which companies keep the responsibility for and ownership of their materials and products could also mean that only the highest-quality products – ones that can easily be remanufactured, upgraded or disassembled – will be on the market.

The list of technologies and tools that companies and private users can lease as a service is long: from solar panels to lighting-as-a-service; from chemical leasing to clothes and furniture.[13] Many big corporations such as Bosch, Philips, BMW and IKEA are experimenting with PaaS business models in different countries, and so are start-ups and small companies such as Bundles, Homie, Grover, Gerrard Street and Fairphone. PaaS is used also in the packaging sector in order to reduce single-use packaging. CupClub helps shops to reduce throwaway packaging, creating a traceable system as part of a cup-as-a-service model,[14] and the Finnish company RePack offers a packaging-as-a-service model in which envelopes, once the delivery is accomplished, go back to the company, ready to be used again and again.[15]

12 URL: www.bosch-home.com/ne/specials/i-dos.

13 The Global Chemical Leasing Programme is an initiative by UNIDO (https://chemicalleasing.org).

14 URL: https://cupclub.com.

15 URL: www.repack.com.

Sharing platforms and tool libraries

Sharing and collaborative consumption practices are other forms of non-ownership that extend the life cycles of products. The *usership* of products – the leasing, renting and sharing of objects and materials – has an effect on the environment too: collaborative consumption models are recognized as one of the best available options on the consumer side for switching from the present business-as-usual model to the more environmentally friendly circular economy.[16] These collaborative models (e.g. sharing, bartering, lending, trading, renting, gifting) are based on shared ownership among multiple consumers, and in many cases they are also useful for their community dimension as they are based on trust.

While items can be shared online through digital platforms, physical tool libraries allow borrowing closer to home for simple items such as baby carriers, board games and climbing harnesses, as well as more complex technologies such as drones, robots and VR headsets. The common goal is simple: encouraging reuse and sharing to increase access to products in an affordable way, while diminishing consumption and waste at the same time. Tool libraries are not only about sharing items: they bring people together, creating communities. They offer an intergenerational meeting spot where old and young people share their skills in woodwork, metalwork, DIY, repair techniques and more.

It is worth underlining that usership is not automatically sustainable. While it seems that sharing services promote social cohesion, it is not accurate to say that all non-ownership models result in a lower environmental footprint. The reduction of the environmental impacts associated with the different forms of usership activities is potential, but it is not automatic. While it is not clear to what degree the use of savings or earnings from the platforms might increase

16 Ness, D. 2008. Sustainable urban infrastructure in China: towards a factor 10 improvement in resource productivity through integrated infrastructure system. *International Journal of Sustainable Development & World Ecology* 15, 288–301. Preston, F. 2012. A global redesign? Shaping the circular economy. Report, Energy, Environment and Resource Governance, Chatham House.

resource use, rebound effects – whereby efficiency gains lead to increased resource consumption as savings are used to expand production and consumption – are very common, as shown by some research and pilot projects.

The right to repair and remanufacturing

Remanufacturing is an industrial practice that involves 'returning a product to at least its original performance with a warranty that is equivalent or better than that of the newly manufactured product'.[17] Traditionally, 90% of remanufacturing activities take place in the business-to-business sector. However, the business-to-consumer (B2C) side is also growing, especially in the electronics industry with products such as smartphones. Driven by the Right to Repair movement, in the consumer goods sector the lifespan of products has been extended. Repair, refurbishment and remanufacturing are possible thanks to both local small-scale repair franchises and large industrial-scale factories at the national and international levels.

The right to repair and remanufacturing are crucial elements in addressing the end-of-life moment for products. Even if the products have been shared or used as a service, if at the end of their lifespans they end up in landfill or are 'simply' recycled, the waste of materials and energy used in producing them is immense (without even considering the energy saved from dismantling and shredding each component of a product).

In harnessing the value of products though remanufacturing and repair, infrastructure is key. It is fundamental to build systems of reverse logistics and spread widely the small- and large-scale facilities that can repair, refurbish or remanufacture appliances. It is also necessary to rethink the design of products. More sustainable and circular products and business models are possible only if the design and manufacturing phases aim to close the loops through more circular supply chains (e.g. with industrial symbiosis) and resource recovery

17 European Remanufacturing Network. 2015. Remanufacturing market study. Report, European Remanufacturing Network (www.remanufacturing.eu/assets/pdfs/remanufacturing-market-study.pdf).

(e.g. with cities becoming urban mines for metals and materials). Building and incentivizing the secondary raw materials market is also crucial in developing and strengthening repair and remanufacturing models.

THE CONNECTION BETWEEN SUSTAINABILITY AND INEQUALITY

The gap between people who are able to afford certain products and that cannot is broadening as inequality increases. In order to address the challenge of inequality from a circular economy perspective, we need to focus on people in their role as consumers/users and on their access to products and services.

Inequality is a common problem for the most advanced economies, and it represents a threat to their stability. Stiglitz in *The Price of Inequality*[18] and Pickett and Wilkinson in *The Spirit Level*[19] argue that increasing inequality is at the heart of the lack of social cohesion, increased crime, ill health, teenage pregnancy, obesity and many other social problems. Inequality, and not wealth, has the greatest effect on the social welfare of rich nations.

In *Doughnut Economics*, Raworth links extreme social inequality and severe ecological degradation, saying that 'these trends echo the conditions under which many earlier civilizations have collapsed'.[20] Inequality 'erodes the social capital that underpins the collective action needed to demand, enact and enforce environmental legislation. And social norms – such as using less water during a summer drought, or recycling household waste – are far more likely to be adhered to in a society that regards itself as a community of peers.'[21] Reversing the widening gaps of income and wealth is fundamental to getting into the doughnut:

18 Stiglitz, J. 2012. *The Price of Inequality*. W.W. Norton & Company.

19 Wilkinson, R., and Pickett, K. 2010. *The Spirit Level: Why Equality Is Better for Everyone*. Penguin Books.

20 Raworth K. 2017. *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*, p. 132. Chelsea Green Publishing.

21 Ibid., pp. 144–145.

> At the start of the 21st century, we have transgressed at least four planetary boundaries, many millions of people live in extreme deprivation, and the richest 1% owns half of the world's financial wealth. These conditions could be driving us towards collapse. If we are to avoid such a fate for our own civilization, we need to transform the current global economic system from one that is divisive and degenerative to one that is distributive and regenerative by design.[22]

The UN Department of Economic and Social Affairs published a working paper in 2015 that investigates similar issues. The paper underlines the negative correlation between income inequality and environmental outcomes, and shows that reducing inequality could have an important role in achieving environmental sustainability.[23]

Other empirical evidence also demonstrates that income and wealth inequality can negatively impact environmental sustainability. Even though the rich represent a small social group in terms of numbers, they can often move national decision-making towards their own interests, which may be closer to policies that are negative for the environment. Also, an inequality of political power deriving from income inequality may allow the rich to 'dump' pollution on poor and disempowered people, while they protect themselves from the consequences of pollution in different ways. As an outcome, income inequality may generate a society with a higher aggregate level of pollution than would have been possible in a more equal society. Greater income inequality is also associated with greater biodiversity loss.

A negative correlation between income inequality and environmental outcomes such as the generation of waste has been discovered by looking at consumption behaviour. Findings from Dorling, Barford and Wheeler show that rich countries with higher

22 Ibid., p. 132.

23 Nazrul Islam, S. 2015. Inequality and environmental sustainability. DESA Working Paper 145 ST/ESA/2015/DWP/145 (www.un.org/sites/un2.un.org/files/1597341726.2653.pdf).

inequality use more resources and produce more waste per person.[24] For Boyce, the scale of an environmentally degrading activity depends on the balance of power between the winners, who get the net benefits from the negative activity, and the losers, who bear the net costs.[25] The more powerful the winners are in the power balance, the more environmental degradation occurs. Greater inequalities of power and wealth lead, according to Boyce, to greater environmental degradation for three main reasons: the excess of environmental degradation driven by powerful winners not being compensated by the environmental degradation prevented by powerful losers; inequality increasing the valuation of the benefits harvested by the rich and powerful winners relative to costs dumped on the poor and less powerful losers; and, finally, inequality increasing the rate of time preference given to environmentally damaging resources by the poor and the rich by increasing their poverty and political insecurity, respectively.

Looking at how to counterbalance inequality in a circular economy, Vezzoli *et al.* suggest that product-service systems could enable the integration of disfavoured populations into economic activity because these population segments would be able to pay for use instead of purchasing goods.[26] For that integration to happen, it is crucial that we foster behavioural change, looking in particular at best practices and incentives.

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24 Dorling, D., Barford, A., and Wheeler, B. 2007. Health impacts of an environmental disaster: a polemic. *Environmental Research Letters* 2. For more on the same topic see also Danny Dorling's presentation given to the Royal Geographical Society in May 2010 and his presentation on 'The economics of social inequality and the natural environment' in November 2011. Dorling, D. 2010. Is more equal more green? Research Paper, University of Sheffield. Dorling, D. 2010. Social inequality and environmental justice. *Environmental Scientist* 19(3), 9–13.

25 Boyce, J. 1994. Inequality as a cause of environmental degradation. *Ecological Economics* 11, 169–178.

26 Vezzoli, C., Ceschin, F., Carel, J., Kohtala, C., Diehl, J. C., and Kohtala, C. 2015. New design challenges to widely implement 'Sustainable Product-Service Systems'. *Journal of Cleaner Production* 97.

BEHAVIOURAL CHANGE: BEST PRACTICES AND INCENTIVES

In the transition to circular business models, people and their behaviours are central, as is the relationship between customers and companies, which changes from a one-time transaction to one based on an ongoing relationship. The consumption patterns of consumers are one of the most important elements in the transition. For example, people need to overcome various non-rational impressions and consumption choices that result in worse alternatives, both monetarily and environmentally.

In considering how to obtain behavioural change related to new ways of ownership and usership, we can look to studies and pilot projects from the past few decades. According to the academic literature, one of the reasons why product-service systems (PSSs) have not been widely implemented is that consumers still value having control over things and owning material possessions.

Objects offered through product-as-a-service models are sometimes less accessible, or have more intangible value, than competing products. This is partly due to the fact that PSSs usually do not give consumers as much freedom or, in some cases, they leave them with the perception that the service provider could decide how they should behave or how they should experience the product. Complexity, reliability, contamination, responsibility, a lack of trust in the service provider, economic obstacles and an unfamiliarity with the concept all impede consumers' acceptance of access-based services, too.[27] Social practice studies have identified nascent practices such as new shared patterns of everyday routines, perceptions and value judgements among individual actors, and they are also assessing the

27 Pinheiro, M. A. P., Seles, B. M. R. P., De Camargo Fiorini, P., Jugend, D., Lopes de Sousa Jabbour, A. B., da Silva, H. M. R. and Latan, H. 2019. The role of new product development in underpinning the circular economy. *Management Decision* 57(4), 840–862.

transformative impact of policies in the corporate sector: in individual firms, community initiatives and related social innovations.[28]

Today, though, consumers have started to indicate a preference for access over ownership (e.g. car-sharing services) and an inclination to purchase used goods in second-hand markets. These new behaviours appear to be driven, at least partly, by a desire to save money, protect the environment and engage with community members via sharing platforms.

'The end of ownership report' by Zuora and the Subscribed Institute explored the changing consumer preferences in the subscription economy through an international survey involving twelve countries (the United States, the United Kingdom, Australia, China, France, Germany, Italy, Japan, the Netherlands, New Zealand, Singapore and Spain).[29] According to this survey, 78% of adults internationally are currently subscribed to subscription services (higher than the 71% in 2018). An increasing number of people have subscriptions, which can relieve them of the burden of ownership and give them more flexibility and access to the experiences they want. The report found that convenience (42%), cost savings (35%) and greater variety (35%) are the top benefits of subscription. Together with entertainment – music services and on-demand TV and movies – adults that use subscription service models are interested in grocery delivery services.

According to research by Lab42, the things that consumers rent most frequently are furniture (45%), followed by gaming systems (37%), clothing and tools (35%), technology (33%) and jewellery/accessories and home appliances (both 29%).[30] There is a generational divide: the majority of these consumers are 18–38 years old (64%) and unmarried (65%). The main reasons for consumers renting range from testing things before purchase to temporary solutions and needs, from being less expensive and more convenient to incurring

28 Schulz, C., Hjaltadóttir, R. E., and Hild, P. 2019. Practising circles: studying institutional change and circular economy practices. *Journal of Cleaner Production* 237.

29 Subscribed Institute. 2020. The end of ownership report. Report, Subscribed Institute, Zuora.

30 Lab42. 2019. What's mine is yours … and yours … and yours; the sharing economy and renting trends. Research Report, Lab24.

less maintenance and responsibility. Thirty-two percent of the people in the survey declared that they rent because they get higher-quality products compared with the ones they can afford to buy.

Looking at the clothing sector, formal and professional events are the main reasons why people rent, followed by a need for seasonal or vacation items. The motivations for renting furniture include living in temporary housing (45%), purchasing being too expensive (43%) and testing a new item before purchasing (41%).

Indeed, wider consumer acceptance of product-as-a-service and sharing models could increase product utilization, while access-based services can reduce financial and performance risks for consumers, who only pay a fee per usage and are not responsible for maintenance, repair or other running costs.

Circular business models, however, also diminish the responsibility that people feel towards products. The literature suggests that users can become less responsible when a product is not owned, leading to reduced efficiencies and increasing the deterioration of the product.[31] Because people do not own the products, it is unlikely that they would develop a strong attachment to them,[32] and consequently they may take less care of them.[33]

The Dutch company Bugaboo International ran a pilot project funded by the European Union's Seventh Framework Programme for research, technological development and demonstration. During the ResCoM pilot, Bugaboo trialled a small-scale scheme (involving fifty customers) offering a leasing package for new strollers.[34] Customers could subscribe to the Bugaboo Flex Plan to lease a stroller by paying a deposit and a monthly fixed fee. People were likely to treat the products with much less care than if they were their own – the strollers were sometimes damaged after only a few months, despite

31 Cohen, B., and Kietzmann, J. 2014. Ride on! Mobility business models for the sharing economy. *Organization and Environment* 27(3), 279–296.

32 Mugge, R., Schoormans, J. P. L., and Schifferstein, H. N. 2005. Design strategies to postpone consumers' product replacement: the value of a strong person–product relationship. *Design Journal* 8(2), 38–48.

33 Bardhi, F., and Eckhardt, G. M. 2012. Access-based consumption: the case of car sharing. *Journal of Consumer Research* 39(4), 881–898.

34 URL: www.rescoms.eu.

customers paying a deposit of €200 – while in the current ownership scenario, Bugaboo products are expected to be used by two to three families. Even though the ResCoM pilot's aim was to understand how the collection, remanufacturing and reuse of products can lead to more profitable, resource-efficient and resilient business practices compared with the current linear manufacturing system, it revealed a number of barriers and challenges to capturing the full value of the leasing model.

Even if it makes sense from the energy-efficiency and environmental points of view, products that are leased, refurbished, remanufactured or repaired are mostly bought or used by wealthy, well-educated, environmentally aware customers. A crucial step to fight planned obsolescence and easy-to-break items is to also allow people with low incomes to afford these energy-efficient and high-quality products.

With this goal in mind, Turntoo together with Eigen Haard and Bosch ran a pilot project called 'Besparen in huis met goede apparaten' ('Saving at home with good appliances'). In the pilot project, which ran from 2013 to 2020 in Amsterdam, tenants of the Eigen Haard housing association were given the opportunity to rent energy-efficient household appliances, financed by Turntoo. The pilot project ended with the appliances taken back by Bosch and refurbished at the company facility in Tilburg.

The sharing or leasing of products could also be achieved through different ways of financing, e.g. crowdfunding. Formerly through the digital platform Oneplanetcrowd and currently through Bundles-Invest, the Dutch company Bundles finances its assets such as washing machines and coffee machines through bottom-up investments in order to offer them through a product-as-a-service business model.

Public procurement is also fundamental for behavioural change, as shown by the EU-funded Circular PP Project.[35] Thanks to this project, the City of Malmö has pioneered behavioural change in public procurement, orienting its furniture procurement towards the circular economy by focusing on repair, reuse and refurbishment. Malmö created a circular framework contract for office and conference furniture that could be used by buyers, who have second-hand,

35 URL: http://circularpp.eu.

used or refurbished furniture as their first options. Alongside the creation of the new framework contract, Malmö developed a 'Priority List' (see Figure 1) with the aim of guiding circular procurement decision-making whenever a need for furniture arises. After the first year of implementing the contract for circular/non-new furniture, about 10% of the office furniture bought by the City of Malmö was non-new furniture; after the second year it was 15% of the total. Thanks to the project the City of Malmö saved about 170,000 kg of CO_2-equivalent each year.

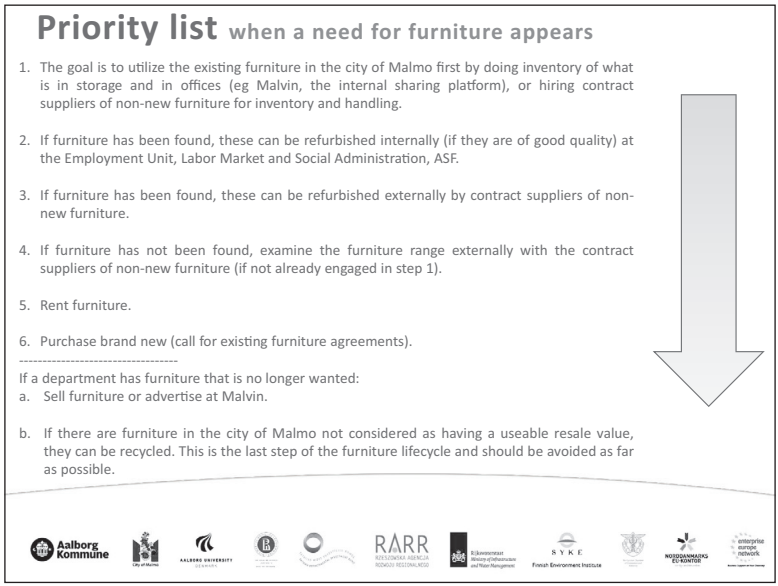

Figure 1. The 'Priority List' from the City of Malmö's Circular PP Project (image courtesy of the City of Malmö).

Two other crucial sectors for the development of a more circular economy are the electronics and construction industries. Both of these are responsible for the consumption of a great quantity of materials and the production of a great quantity of waste, with a low rate of recycling and reuse. Considering how strategic the recovery of metals and materials is and will be, both sectors need to extend the life cycle of their products and keep the value of the materials in the loop for as long as possible.

In the electronics sector the efforts to keep smartphones, laptops and other items working are essential. Reuse and refurbishment are business models that are very beneficial in this industry. Online marketplaces for refurbished electronics such as second-hand phones, laptops and tablets have been developed in the last few years, such as Refurbed in Austria and riCompro in Italy. In the same sector, it is worth highlighting the circular and social experience of RECOSI (Regional and European Cooperation for Social Industry), a social franchise involved in the reuse and refurbishment of ICT (PCs, laptops, monitors, tablets) and WEEE (waste electrical and electronic equipment) that operates in Ireland and in Slovenia.[36]

With the aim of keeping materials in the loop, the construction sector developed the concepts of 'buildings as material banks' and the 'materials passport'. Looking at the most promising behavioural changes and business models, in 2017 the RESTORE (Rethinking Sustainability Towards a Regenerative Economy) project brought together a group of researchers and experts to investigate how to address a paradigm shift towards sustainability in the construction sector.[37] Conservation, restoration, reconstruction, reuse and revitalization emerged as central models for ensuring that heritage retains its cultural richness while allowing an ecologically sound and socially just future.

The reuse of building materials is also enabled by platforms such as Environmate and Restado – digital marketplaces for mapping and selling leftover construction materials to both construction firms and individual customers.

Focus: the clothing sector against fast fashion

The clothing industry, so unsustainable in the last few decades, has been hit by a great number of new companies trying the rental-based model (clothes-as-a-service). From Le Tote in the United States to Y Closet in China, from Vigga in Finland to Bundlee in the United Kingdom (these last two focused on children's clothes), the concept of a subscription to temporarily rent a full wardrobe or certain items

36 URL: https://recosi.net/.

37 URL: https:// www.eurestore.eu/.

is becoming more common – especially in the case of a baby's wardrobe, which can be swapped as children grow.

One pioneer in the sector was Mud Jeans.[38] A monthly membership fee of €9.95 enables you to rent a favourite pair of jeans (or more than one), return them after a year and get a new pair. Mud Jeans keeps the ownership of the garment – an approach that has changed its cash flow as well as the role of the brand, which needs to build a long-lasting relationship with the consumer that continues after purchase.

This phenomenon also involves the shoes sector, another unsustainable market: approximately 22 billion of the 24 billion pairs of shoes that are manufactured each year end up in landfill. The On Running company redesigned running shoes from a circular perspective, from the initial design to the end recycling process, and launched Cyclon: running shoes made with bio-based materials and offered as a service upon monthly subscription.[39]

Sporting footwear manufacturer Vivobarefoot, a certified B Corp, launched the sector's first proposal for end-of-life management, known as ReVivo.[40] The initiative allows consumers to send their Vivo shoes back to the manufacturer once their use-life has ended so that they can be refurbished and resold on the ReVivo online marketplace. The shoes returned to the company are refurbished; the ones that cannot be repaired are disassembled and their parts reused to create substrates for equine sports arenas.

Second-hand digital platforms are increasing too. Refurbished items are now being sold by big brands like Patagonia, Levi's and Eileen Fisher, alongside smaller companies like Renewal Workshop that are totally focused on the sale of renewed apparel obtained from items deemed unsaleable that would otherwise be sent to landfill. The market for pre-loved clothes is expanding, as shown by the two IPOs in the clothing-resale space at the beginning of 2021.

Subscription services could have the ability to lower the material footprint of the industry at large, though this is yet to be proved; accessibility for people with low and medium incomes, on the other

38 URL: https://mudjeans.eu.
39 URL: www.on-running.com/en-it/cyclon.
40 URL: www.revivo.com.

hand, is an element that is often ignored by circular business models in the clothing sector. Very often, clothes-as-a-service concerns only the luxury segment of the market.

Focus: household appliances against planned obsolescence

From a lack of transparency in the supply chain to the precious and critical materials involved, and from planned obsolescence to the low quality of the machines that low-income people are left with, it is crucial to address the environmental and social issues connected with household appliances. In the last few years some projects and companies have been trying to find new ways of delivering high-quality and eco-efficient appliances that last longer.

Bosch runs the Papillon project[41] in Belgium and the Blue Movement[42] in the Netherlands, both based on the product-as-a-service business model. The Papillon project, in particular, provides an appliance rental model for low-income households that do not have the funds to purchase new, high-efficiency appliances. Energy-poor households often use domestic appliances that have high energy consumption while also being outdated, unreliable and expensive to run. This often leads to energy debt in low-income households. Together with Samenlevingsopbouw West-Vlaanderen, a Belgian community development organization, the Papillon project gives people in energy poverty a ten-year rental contract that includes service and warranty at the cost of €7 per month. In this way, energy-efficient appliances are made accessible for people who cannot buy them. Bosch delivers the high-efficiency appliances and takes care of the service and warranty.

Electrolux has carried out a pilot project in Gotland, Sweden, where in fifty households an ordinary washing machine was replaced by a product-service system: a pay-per-wash service. The pilot study significantly changed the interaction between the company and the consumer. The measurement of the number of washing cycles was made possible thanks to an energy-efficient digital washing machine, a central database and the installation of smart energy

41 URL: www.bosch.com/stories/papillon-project.
42 URL: www.bluemovement.com.

meters. Bundles and Homie, both operating in the Netherlands, are two companies that were founded and run exclusively on pay-per-use business models for fridges, dishwashers and washing machines. Many of these companies and projects, which track customers' habits, are trying to slowly nudge users towards more sustainable usage of machines and more sustainable consumption patterns. While helping customers to lower energy, water and detergent use is noteworthy, having data about users' habits creates some privacy issues that might need to be addressed in the coming years.

Alongside usership models, other circular business models are also increasingly prevalent in the appliances sectors. Refurbishment and remanufacturing, also supported by the Right to Repair movement, are spreading widely. Re-Generation is a project from Astelav in Turin – a European leader in spare parts for household appliances – that regenerates washing machines and ovens, which are then resold with a twelve-month warranty.[43] Re-Generation also has a social outcome: the project is run together with Sermig (Youth Missionary Service) in order to transfer skills to marginalized and young people from difficult social contexts.

PROPOSALS

Circular business models challenge the current economic system and can bring changes in ownership, production and consumption patterns. While these new business models are spreading widely, one of the challenges is to expand their reach far beyond the people that can already afford the full price of new products.

Raise popular awareness around the topics of sustainability and the circular economy; raise awareness in organizations and among clients of the implications and the benefits of resource efficiency and material flows

In order to drive changes in people's mindsets and overcome barriers (e.g. the lack of ownership in a product-as-a-service solution, or the perception that refurbished items are not as good as new ones), raising

43 URL: www.ri-generation.com.

awareness among users might be very useful. Raising consumers' awareness can be done by providing access to reliable information on products to promote circular behaviour. Raising awareness is also crucial to involving the low-income people who could benefit the most from circular business models. An inclusive circular economy has to be as much about changing social practices and behaviour and encouraging the active involvement of people as it is about redesigning products and services. So far citizens have only occasionally been involved in the public conversations and academic discourse on the circular economy.

Plan for fiscal incentives that aim to promote the longevity of products and materials through better maintenance, repair, reuse and remanufacturing (leaving recycling as a last option)

Infrastructure and legal rules need to be developed and organized in order to allow local, national or European circular models to work. These include deposit and collection schemes for resource recovery as well as effective reverse logistics, tracking and tracing product returns, ensuring the regulatory compliance associated with refurbished products, and optimizing design for leasing and refurbishment. The financial feasibility of these new business models compared with the existing ones needs to be explored further. Reuse, repair and refurbishment models require investments in the training of people and the creation of education paths for manual skills.

Finance rental services or tool libraries to experiment with ways for especially disadvantaged populations or people with low incomes to access high-quality products without ownership

Rental services and tool libraries, as well as creating a sense of community, can be a good way to counterbalance planned obsolescence and reduce waste. Sharing community tools and instruments at a neighbourhood level can become the new normal. Accessing furniture and appliances as a service, built with circularity in mind from

the design and manufacturing phases, could, in many contexts, become an opt-out rather than an opt-in system. Pilot projects can be used to understand how some measures in this direction can help planned climate policies, rules and regulations while reducing inequality in society.

The job impact of the circular economy: an outline

By Dr Kris Bachus

The transition to a more circular economy seems to be less controversial than the transition to a low-carbon (or net zero-carbon) society. Yet, in both cases, and for other (spontaneous or instigated) megatrends as well, the necessary changes would have an important impact on the way we live and organize our society, in both economic and social terms.

In general, the transition to a more circular economy is expected to be a boost for economic growth rather than threatening it, which may explain why it seems to be opposed less than the climate transition. Similarly, employment impacts are projected to be unambiguously positive, at least on the macro level. Even at the sector level, the transition is expected to have only minor negative impacts, especially compared with the climate transition. The sectors that suffer from a more circular economy will show great overlap with the ones that suffer from the climate transition, as 45% of carbon emissions are estimated to be directly linked to the production and consumption of products and materials.[1] These sectors include the fossil fuel industries (extraction and refinery), cement, basic materials, glass and paper.

This chapter will delve deeper into the job impacts that the circular economy can be expected to have in developed economies, particularly in EU countries.

Jobs that are impacted by the transition to a more circular economy are sometimes referred to as 'circular jobs' or 'circular employment'. Although jobs, as such, cannot be circular in the sense

1 Ellen MacArthur Foundation. 2021. Completing the picture: how the circular economy tackles climate change. Policy Brief, Ellen MacArthur Foundation.

of closing material loops, they can be related to activities that are related to material loops. In this chapter, we will use all of these terms as synonyms.

WHAT DO WE KNOW? THE NUMBERS TODAY

Most studies agree that the transition to a circular economy is still in an early phase. The 2021 'Circularity gap report' by the think tank Circle Economy estimates that the world is currently only '8.6% circular', and that number is going not up but down. A number for the EU has not been calculated yet, but country-specific reports have revealed that the gap tends to be lower for economically strong countries, although there are large discrepancies, ranging from only 2.4% circularity in Norway to 9.7% in Austria and even 24.5% in the Netherlands.

Despite these low numbers, many current economic activities and jobs already have a clear link with the circular economy. Eurostat data show that in 2018 an estimated 3.5 million jobs could be explicitly attributed to the circular economy in the EU 27, encompassing recycling, repair and reuse. Between 2011 and 2018, this number grew by 6.6%. It is important to note that these employment numbers are based on the NACE activity nomenclature,[2] and they constitute an underestimation for two reasons. First, they only allow the counting of jobs in sectors with a '100% circular' label. In reality, many other NACE sectors employ a mix of circular and non-circular activities. The construction sector is a good example: building new houses with primary materials is not a circular activity, but retrofitting houses is. Second, sectors without circular goods or services offered on the market can still have jobs that support circular strategies, e.g. a worker in the petrochemical sector who is responsible for re-entering production waste into the production process.

The Eurostat data on circular jobs are incomplete and are based on different methodologies. A more detailed study was done for Flanders in Belgium, which found that circular jobs grew by 16.4%

2 The NACE is the statistical classification of economic activities in the European Community.

between 2008 and 2020 – a significantly higher growth figure than for overall employment growth, which was 5.8%.[3]

Eurostat does not publish data on current skills or schooling levels in the circular economy. The Flemish study found that employees in the circular economy are more often low or medium skilled, and proportionally less high skilled than the average Flemish worker.[4] Eight-two percent of the employees are men, 59% work blue collar jobs, and ages and wages do not deviate much from the Flemish average.

One characteristic that is found in multiple studies is that circular jobs tend to be more labour intensive than average. Reuse, rental and leasing, and repair are the most labour-intensive circular activities, while waste and motor vehicle repair and maintenance are less labour intensive than the average sector. The most material-intensive sectors, headed by the construction sector, are much less labour intensive than average.[5]

FUTURE EMPLOYMENT IN THE CIRCULAR ECONOMY

The circular economy is expected to affect the labour market through four types of changes: job creation, job substitution, job losses and job redefinitions.[6]

Although quantitative studies on the job impact of the circular economy are still rather scarce, they tend to come to the conclusion that employment gains could range between 0% and 2%.[7] Growth is stronger in scenarios that model the circular economy with a tax shift, as a budget-neutral operation, in which the introduction or

3 Multani, M., Bachus, K., and Ampe, K. 2021. Circular jobs in Flanders. CE Center, KU Leuven (https://ce-center.vlaanderen-circulair.be/en/blog/post/up-to-30-000-extra-jobs-by-2030).

4 Ibid.

5 Laubinger, F., Lanzi, E., and Chateau, J. 2020. Labour market consequences of a transition to a circular economy: a review paper. OECD Environment Working Papers.

6 Ibid.

7 Ibid.

increase of material taxes is combined with a reduction in other distortionary taxes, such as labour taxation. The circular tax shift seems to be an important condition for the breakthrough of the circular economy.

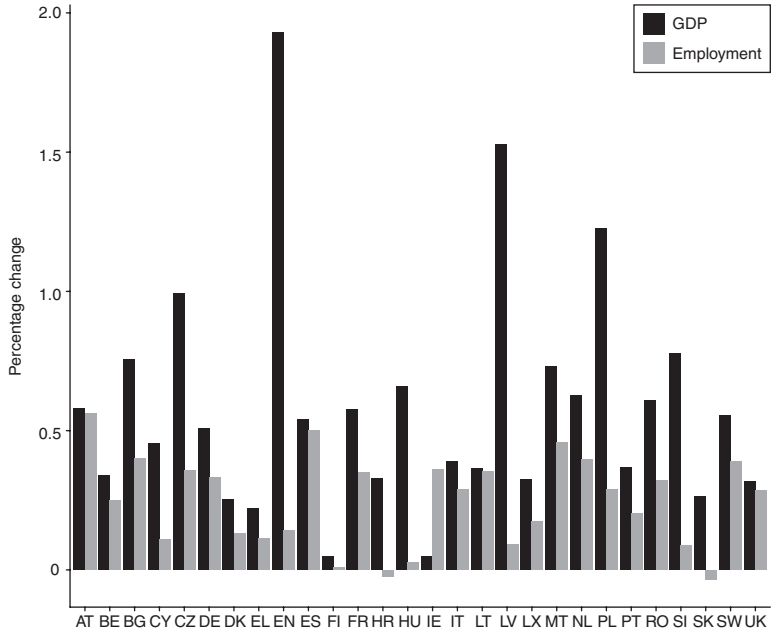

Figure 1. Impact of the circular economy transition on GDP and employment (for 28 EU member states, including the UK). *Source*: Cambridge Econometrics, Trinomics and ICF, 2018.

In the EU, a net employment increase of 0.3%, or 700,000 jobs, could be reached by the transition to a circular economy.[8] The impact is positive or negligible in all member states, as is shown in Figure 1.[9]

8 These figures include the UK.

9 Cambridge Econometrics, Trinomics and ICF. 2018. Impacts of circular economy policies on the labour market: final report and annexes. Report, European Commission, figure 5.3 (https://op.europa.eu/en/publication-detail/-/publication/fc373862-704d-11e8-9483-01aa75ed71a1/language-en).

Most jobs are expected to be created in the waste and services sectors, while employment would also grow in repair, other manufacturing and utilities. Construction, electronics, non-metallic minerals, motor vehicles, plastics and transport would be net job losers. Job losses in the construction sector could be significant – 180,000 jobs in the EU: a fall caused by productivity gains resulting from new building techniques – but all the other negative numbers are very modest. The net-positive overall employment effect can be explained by the fact that product life-extension activities, such as repair, reuse and refurbishment, are more labour intensive than primary production because they have a lower potential for automation and economies of scale. Moreover, a further shift from industry to services will equally increase employment.[10]

Alongside employment, GDP is also expected to get a boost from the circular economy: by 0.5%. The 2021 study by Multani *et al.* concluded that it is possible to become more resource efficient and increase employment at the same time. These results correspond with earlier studies on the employment impact of a climate tax shift.

In the circular economy, when realized through a circular and/or climate tax shift, relative prices are expected to partially shift towards more expensive resources (including energy) and (relatively) cheaper labour. This will likely cause some heavily globalized value chains to be shortened, with more activities – from design, manufacturing and end-of-first-life activities to even material extraction (urban mining) – happening in the same country, or at least with a lower transport footprint.[11] The reshoring of activities will likely create employment benefits in countries with high consumption levels, such as those in the EU. However, employment benefits could be spread unevenly on a global scale. More particularly, employment gains in the EU may come at the expense of low- and middle-income countries. Focusing on apparel value chains, Repp *et al.* found that production in

10 Laubinger, Lanzi and Chateau (2020). Labour market consequences.

11 De Angelis, R., Howard, M., and Miemczyk, J. 2018. Supply chain management and the circular economy: towards the circular supply chain. *Production Planning & Control* 29(6), 425–437 (https://doi.org/10.1080/09537287.2018.1449244).

countries such as Bangladesh, China, India, Turkey and Cambodia could suffer severe losses as a result of a lower demand for raw materials and an increase in reuse and repair in developed countries.[12] The EU could take into account this global impact to ensure that its transition to a circular economy is in line with the Sustainable Development Goals, and that no one is left behind.

THE JUST TRANSITION AND DECENT JOBS

The expected net-positive employment effect is a positive societal impact. However, along with the quantity of jobs, the characteristics of these new and changing jobs should also be considered. The first point of attention is job duration. While a boost in jobs in the waste-related sector can be expected in the short and medium term, many of these jobs may become obsolete again once the transition to a circular economy is in an advanced state, which would imply that the majority of waste to be treated would have been eliminated.[13] A second point of consideration is job quality. Although this effect is still in an early phase of exploration, the WHO has drawn attention to a number of risks, particularly related to managing waste and the potential exposure to hazardous substances. These risks frequently occur in the informal economy, and are known to often hit vulnerable groups disproportionately, including children and poor families.[14]

The scaling of circular business models, such as product-service systems or sharing platforms, could have a significant impact on the economy and on jobs. Sharing platforms such as Uber and Airbnb raise some concerns over the exploitation of workers. However, product-service systems do not as such require a different

12 Repp, L., Hekkert, M., and Kirchherr, J. 2021. Circular economy-induced global employment shifts in apparel value chains: job reduction in apparel production activities, job growth in reuse and recycling activities. *Resources, Conservation and Recycling* 171, 105621 (https://doi.org/10.1016/j.resconrec.2021.105621).

13 Laubinger, Lanzi and Chateau (2020). Labour market consequences.

14 WHO Regional Office for Europe. 2018. Circular economy and health: opportunities and risks. Report, WHO, Copenhagen.

employer–employee relationship, and the concerns over large sharing platforms are more a feature of the platform economy (or the gig economy) than of the circular economy. Moreover, while there are certainly grounds for caution, the platform economy creates both good and bad jobs, and a nuanced view is required.[15]

One area where the circular economy could serve the just transition is the social economy. Many European countries have a strong sector of social economy companies whose primary aim is to provide employment opportunities to people with vulnerabilities in the labour market. In some countries, such as Belgium, the social economy is an important driver of the second-hand economy.[16] In the future circular economy, the social economy could create additional jobs in repair and maintenance, refurbishment and reuse. The role of the social economy is treated in more detail in Tim Gore's chapter later in this volume ('Labour rights and inclusion: towards a social-circular economy').

THE SKILLS CHALLENGE

It is clear that the circular economy has the potential to create a significant number of new jobs, and that other jobs will need to be redefined or modified. In order for this transformation to happen smoothly, skills development will need to play a crucial role. The availability of well-trained and skilled staff is not only a potential accelerator for the circular economy transition, but it is also a factor that has the potential to slow it down if it remains underdeveloped. In general, new occupations tend to require higher-level qualifications, whereas changes in existing jobs occur more often at the low- and

15 Kalleberg, A. L., and Dunn, M. 2016. Good jobs, bad jobs in the gig economy. *Perspectives on Work* 20, 10–14.

16 Delanoeije, J., and Bachus, K. 2020. Reuse: the understudied circular economy strategy. Working Paper, Policy Research Center for Circular Economy, Leuven.

medium-skill levels.[17] For the circular economy, we can expect that a general upskilling of the workforce will be required.[18]

Burger *et al.* have found that circular economy jobs require significantly more work experience and training on the job than average occupations, but also that skill needs in circular sectors are very heterogeneous, which makes it hard to generalize.[19] What is clear, however, is that technical skills stand out in terms of the skills that are required. According to the same authors, only a relatively small proportion of the skills demand is specifically triggered by circularity. Otherwise, the circular economy mainly requires a high degree of diversity in the labour supply, for which specific skills development may not be required.

Vocational education and training (VET) will be the crucial element that European member states will need to work on to absorb the changes smoothly.[20] The European labour market is already suffering from 'shortage occupations': occupations for which staff with the appropriate skills are hard to find. These shortages are most pressing for jobs that require technical skills and STEM backgrounds.[21] However, the 'T-shaped skills' approach shows that the challenges are not confined to technical skills, instead describing the skills needed as a combination of vertical (technical, specialist) skills and horizontal (soft, digital, social, communication) skills. Employees

17 Strietska-Ilina, O., Hofmann, C., Mercedes, D. H., and Jeon, S. 2011. *Skills for Green Jobs: A Global View*. Job Creation and Enterprise Development Department, Skills and Employability Department, International Labour Office, Geneva.

18 Dufourmont, J. 2021. Working in a more circular economy. Brussels (forthcoming).

19 Burger, M., Stavropoulos, S., Ramkumar, S., Dufourmont, J., and van Oort, F. 2019. The heterogeneous skill-base of circular economy employment. *Research Policy* 48(1), 248–261 (https://doi.org/https://doi.org/10.1016/j.respol.2018.08.015).

20 Goodwin Brown, E., Haigh, L., Schöder, A., Bozkurt, Ö., and Bachus, K. 2021. Closing the skills gap: vocational education and training for the circular economy. Amsterdam.

21 Multani, M., Ampe, K., and Bachus, K. 2021. The impact of the transitions to a circular economy on labour market and skills: literature study. Leuven (forthcoming).

will need the skills to see the value chain they are part of in a more integrated way, building on the previous phases and anticipating the activities in the next.[22] These transversal skills, related to collaboration, anticipation and communication, will gain importance. On the side of the vertical skills, repair, maintenance and general technical skills can be expected to grow in importance.

All relevant stakeholders will need to take up their role to cope with the skills challenge. First, governmental agencies charged with job demand, skills and training will need to anticipate the changes and look beyond short-term needs – which, for many, is outside of their comfort zone. Second, sector federations and businesses will need to be proactive and creative, and engage with other stakeholders, such as the social economy. Third, social partners will need to pay attention to the upskilling transformation, and employees will need to accept that skills development is a common thread running through their careers (lifelong learning), rather than a phase that ends with their entry to the labour market.[23] At times, large-scale reskilling will be required, e.g. when a sector or large company, such as a coal mine, disappears or is significantly downsized due to the transition to a circular economy. In that case, it is realistic to expect that the government will need to add funding and other support to the transformation process led by employers' organizations and trade unions, in order for the whole workforce to find a good alternative so that no one is left behind.

DISCUSSION: IS JOB GROWTH ALWAYS GOOD?

Throughout the world, employment is considered to be one of the central conditions for prosperity, resilience and well-being. It is a condition for realizing economic growth, for financially healthy and institutionally strong governments, and for welfare, health and

22 Willeghems, G., and Bachus, K. 2018. Employment impact of the transition to a circular economy: literature study. SuMMa, KU Leuven.

23 Alessio, C., Goodwin Brown, E., and Sosa, L. 2021. Labor market impact of the circular economy: a briefing for social partners on shaping the future of the circular economy. Amsterdam.

well-being on the side of the workforce. Having a job that allows for a high level of personal fulfilment is part of people's identity, social status and livelihood. For companies and sectors, having staff with the right skills is a condition for productivity and profit growth.

In this context, it is unsurprising that the expected net job growth that the circular economy is forecast to entail is received with great enthusiasm by businesses, governments, trade unions and other civil society organizations. However, if one looks beyond the neoliberal focus on efficiency in circular economy discourses, the employment impact is less straightforward. Looking at the hierarchy of circular economy strategies – the so-called circularity ladder[24] – the number one strategy is 'refuse', which refers to consuming and producing less.[25] Obviously, the shortest material loops with the smallest environmental impact are the ones that do not exist. Moreover, even in the scenario where we do not consume less, but rather shift to large-scale repair, reuse and other strategies for extending product lifetimes, the production and sale of new products and virgin materials may decrease sharply. As a result, some retail activities and jobs could become redundant, and the overall employment impact would still be subject to uncertainty.

Another socio-ethical consideration to take into account is the knock-on effects on developing countries. A shift to a more circular economy may decrease the demand for new products, many of which are manufactured in low- or middle-income countries. Moreover, if the transition to a circular economy shifts the tax burden from labour to materials, this may open the door for reshoring certain manufacturing activities from developing to developed nations, which may increase poverty risks in low-income countries.

24 Willeghems and Bachus (2018). Employment impact of the transition.

25 Reike, D., Vermeulen, W. J. V., and Witjes, S. 2018. The circular economy: new or refurbished as CE 3.0? Exploring controversies in the conceptualization of the circular economy through a focus on history and resource value retention options. *Resources, Conservation and Recycling* 135, 246–264 (https://doi.org/https://doi.org/10.1016/j.resconrec.2017.08.027). This view is highly interlinked with related theories, including the concept of sufficiency. (Princen, T. 2005. *The Logic of Sufficiency*, Boston, MA: MIT Press.)

POLICY RECOMMENDATIONS

A first policy recommendation regarding the circular economy should be aimed at *making it happen*. Up to now, circular initiatives have mostly been voluntary, building on the opportunities that many stakeholders – including businesses, governments, knowledge institutions and civil society actors – observe. However, the question arises of whether this non-binding path will allow the EU to make the step from niche actions and experiments to a large-scale roll-out that transforms the whole economy. For the climate transition, binding targets and policies are now in full deployment to accelerate the transition. It seems realistic that, at a certain moment, the circular economy will need to follow a similar path. The European Parliament shares this vision and has already called for such action.[26] A circular tax shift, to be integrated with a climate tax shift, would inevitably be part of this strategy for acceleration. The challenge, then, will be to design ambitious and transformative policy programmes in such a way that they serve the social pillar of sustainability rather than harming it.

The transition to a circular economy will have net-positive effects on GDP and employment. As such, most governments are embracing the concept, implementing circular economy strategies and supporting their economic and civil society actors to boost the transition. However, up to now, policy objectives and instruments regarding the circular economy have not had the same levels of ambition that the climate transition has received. On the one hand, climate policies such as a climate tax shift will boost the circular economy; but on the other, specific ambitious policies will be needed to further accelerate the circular economy transition. Ideally, governments would design the policies for the two transitions in an integrated way, e.g. by adding material taxes and similar policies to the design of a climate tax shift. Non-renewable resources, such as materials, energy use and undesired wastes and emissions, could be

26 URL: www.europarl.europa.eu/news/nl/press-room/20210122IPR96214/meps-call-for-binding-2030-targets-for-materials-use-and-consumption-footprint.

taxed at a higher level, while taxes on renewable resources, including work, could be reduced.[27] The way the revenues of such a tax shift are recycled will determine its social impact: if part of the revenues go to lowering labour taxes (particularly for low wages), higher social benefits and/or tax credits for vulnerable people, the tax shift could even be a progressive rather than a regressive measure.[28]

The EU and its member states will need to implement strategies that prepare the labour market for the transition. Vocational education and training will be crucial, and prospective studies may contribute to identifying future needs in terms of skills development, thus allowing us to anticipate the changes to expect in the medium term.

Furthermore, the social economy has the potential to turn the circular economy into an opportunity for vulnerable people on the labour market, provided that governments create room for the social economy to grow, which will require increasing subsidies. An additional role for governments is to ensure that new or substituted jobs will be decent jobs in terms of job duration and job quality.

Finally, if EU member states account for the impact the circular economy may have on developing countries, the transition to a circular economy may turn out to be an opportunity instead of a threat in terms of realizing the Sustainable Development Goals.

27 Stahel, W. R. 2013. Policy for material efficiency: sustainable taxation as a departure from the throwaway society. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 371, 20110567 (https://doi.org/10.1098/rsta.2011.0567).

28 Bachus, K. 2019. Sociale rechtvaardigheid van een klimaatshift. In *Klimaat en sociale rechtvaardigheid*, edited by S. Dierckx, pp. 329–347. Oud-Turnhout: Gompel & Svacina.

Labour rights and inclusion: towards a social circular economy

By Tim Gore

The circular economy discourse is, to a large extent, socially blind. While the circular transition holds the promise of an end to exploitative labour conditions in low-cost, linear value chains, there is no guarantee that a more circular economy will be based on principles of social justice. Indeed, there is a risk that reducing material throughput in the economy would increase prices, making goods and services less accessible to lower-income or marginalized households, while decent jobs in manufacturing and retail sectors are also lost, replaced by low-grade roles in the waste-treatment sector.

Some proponents of the circular economy suggest that product-as-a-service business models will improve the affordability of premium, durable products, and that the circular economy will create jobs, notably in labour-intensive repair services. But in this chapter I argue that circular economy business models will not a priori lead to positive social outcomes for workers and lower-income or marginalized households, and that the form of governance of the circular economy will largely shape its social outcomes.

Social economy actors – characterized by democratic or participatory governance arrangements and an explicit social purpose – are uniquely well placed to deliver a circular economy based on decent work and social inclusion. However, without a supportive policy agenda, such actors are also at great risk from the expansion of circular business models. Feedstocks in the second-hand sector may be diverted, and social economy repair or recycling jobs may be supplanted in the process of professionalization, for example.

In this chapter I briefly discuss the lack of attention to social issues in the circular economy discourse to date, explore the social-circular economy nexus at a conceptual level through a typology of

circular–linear and market governance forms, and then assess the opportunities and risks for the social economy in some of the key initiatives under the EU's Circular Economy Action Plan (CEAP). I conclude with brief recommendations related to the implementation of the CEAP and of the Action Plan for the Social Economy (APSE).[1]

THE CIRCULAR ECONOMY IS OFTEN SOCIALLY BLIND

In this chapter I consider a circular economy in broad terms to refer to an economy in which materials are kept in use or circulation in order to reduce material throughput and thereby reduce adverse environmental impacts. Economic actors may be considered to contribute to these goals in a variety of ways, and there is an extensive literature addressing circular business models, often framed in terms of alternative value propositions and means of value creation and capture.[2] Indeed, much of the circular economy literature frames the circular economy first and foremost as a business opportunity.[3] Typically, 'circular economy business models' describes activities such as (see the earlier chapter titled 'Circular business models and behaviours to reduce inequality' for more)

- providing renewable, recyclable or biodegradable resource inputs;
- providing services to recover and reuse resource outputs;

1 European Commission. 2021. Commission presents Action Plan to boost the social economy and create jobs. Press release, European Commission (https://ec.europa.eu/social/main.jsp?langId=en&catId=89&furtherNews=yes&newsId=10117).

2 See for example, Gillabel, J., *et al.* 2021. Business models in a circular economy. EEA. Geissdoerfer, M., *et al.* 2020. Circular business models: a review. *Journal of Cleaner Production* 277. OECD. 2019. Business models for the circular economy: opportunities and challenges for policy. OECD.

3 The Ellen MacArthur Foundation, for example, has contributed significantly to pushing the circular economy onto the political agenda, in part through identifying the business case for circular transitions. See, for example, Ellen MacArthur Foundation. 2021. The business opportunity of a circular economy. In *An Introduction to Circular Economy*, edited by L. Liu and S. Ramakrishna. Springer.

- product life extension, including ecodesign, remanufacturing, repair or remarketing services;
- sharing platforms; and
- providing products as a service.[4]

In principle, each of these types of activity can contribute to lowering demand for virgin materials. It is important to note, however, that economic rebound effects – whereby consumer or business savings in one area are invested in environmentally harmful activities in another – may mean absolute material use, by individual firms or consumers or economy-wide, may still increase.[5] For this reason, effective circular economy policies should not only consist of measures that improve material efficiency or recycling rates, but also be consistent with absolute material usage budgets, related to planetary boundaries. This is often not considered in the literature on circular business models, which is a major omission, some of the implications of which are further explored below.

Significantly for this chapter, this literature also pays very little attention to the social implications of the transition to a circular economy. Most of the circular economy literature that considers social issues at all does so through the lens of labour market impacts (for more discussion on this, see the previous chapter: 'The job impact of the circular economy: an outline'). Even here, though, the focus is usually constrained to consideration of the extent of aggregate job creation, job-shifting between economic sectors, and related implications for skills and training.[6] The quality of these jobs and wider issues concerning respect for labour rights or worker empowerment in circular economic models are mostly overlooked.

4 Adapted from Lacy, P., *et al.* 2014. Circular advantage: innovative business models and technologies to create value in a world without limits to growth. Accenture.

5 See, for example, Zink, T., and Geyer, R. 2017. Circular economy rebound. *Journal of Industrial Ecology* 21(3). Chong-Wen, C. 2021. Clarifying rebound effects of the circular economy in the context of sustainable cities. *Sustainable Cities and Society* 66.

6 See, for example, IISD/SITRA. 2020. Effects of the circular economy on jobs: IISD and SITRA literature review. IISD.

This is a major omission given that the waste-treatment sector, in which the vast majority of new job creation is projected, is widely associated with poor working conditions, both in the EU and in the countries to which the EU has exported waste (as further explored below).[7] Furthermore, the circular transition is projected to shift jobs to that sector from the manufacturing and retail sectors, in which decent work is far more common (particularly where industrial collective agreements are in place). This 'counting the jobs' focus is reflected in the first EU circular economy monitoring framework, in which the only social indicator is the number and proportion of jobs in sectors considered relevant for the circular economy.[8]

Beyond the issue of employment, there is little consideration in the literature of wider issues of social justice. One systematic literature review on the topic found that, with the exception of employment, less than 25% of all articles reviewed included any social thematic aspect at all (see Figure 1).[9] While some made references to the concept of social equity, these were often found to have no quantitative, empirical grounding, or were only simple references to the impacts of the circular economy transition on GDP. The authors concluded that 'so far, there is no explicit evidence on how CE could support the encouragement of social equity'.

The literature addressing other social aspects is scant, with only minimal coverage of, for example, the health implications of circular economy activities in relation to hazardous substances in recycled materials or with regard to food safety;[10] or of opportunities

7 Weghmann, V. 2017. Waste management in Europe: good jobs in the circular economy? European Public Service Union (EPSU).

8 See https://ec.europa.eu/eurostat/web/circular-economy/indicators/monitoring-framework.

9 Padilla-Rivera, A., and Merveille, N. 2020. Addressing the social aspects of a circular economy: a systematic literature review. *Sustainability* 12(19).

10 See, for example, Slorach, P., *et al.* 2020. Environmental sustainability in the food-energy-water-health nexus: a new methodology and an application to food waste in a circular economy. *Waste Management* 113. Wright, C., *et al.* 2019. Circular economy and environmental health in low- and middle-income countries. *Globalisation and Health* 15(65).

for deepening social interactions around the sharing economy; or around circular economy policymaking.[11]

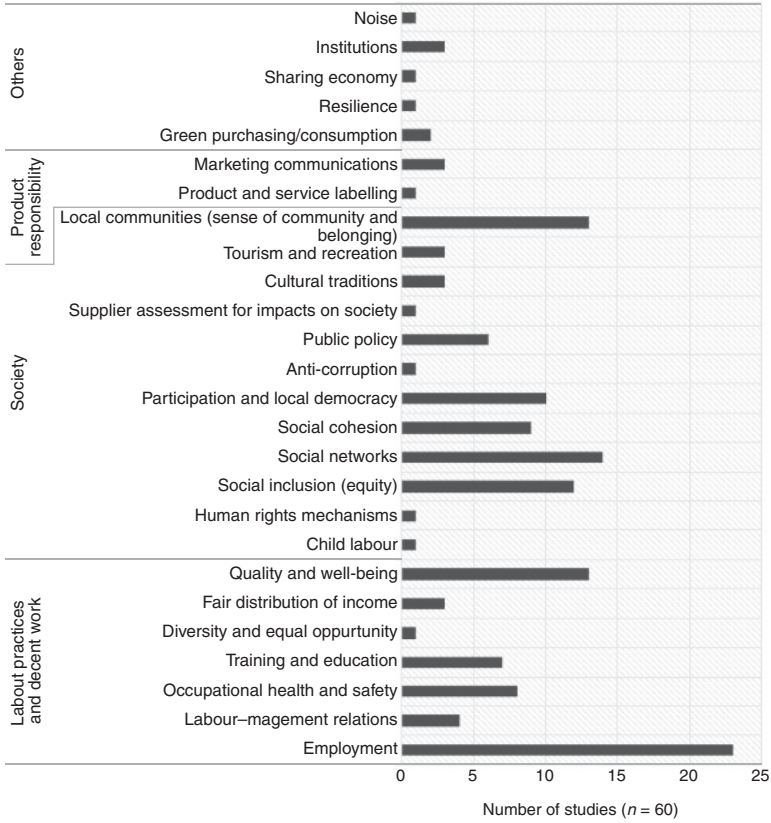

Figure 1. Reproduced from Padilla-Rivera and Merveille (2020): 'Thematic areas and social aspects in the literature review'.

11 See, for example, Pitkanen, K., *et al.* 2020. Sex, drugs and the circular economy: the social impacts of the circular economy and how to measure them. In *Handbook of the Circular Economy*, edited by M. Brandao *et al.* Elgaronline. Lofthouse, V. 2018. Human-centred design of products and services for the circular economy: a review. *Design Journal* 21(4).

Some studies have considered how the circular transition may impact prices for goods and services, and by consequence household income. Econometric studies have noted the likely pass-through to consumers of higher raw material prices driven by market-based measures to encourage material efficiency.[12] Some circular economy proponents, however, have suggested that premium products will become more accessible to lower-income households if offered as a rental service (the so-called product-as-a-service model), and that total ownership costs for households will be reduced by the extension of product lifetimes and other circular strategies.[13]

Nonetheless, the extent to which different types of households – especially those with lower incomes and from more marginalized communities – may have access to the benefits of the circular economy warrants far more attention than it has received in circular economy debates to date. The limited uptake among lower-income or marginalized households of energy-efficiency measures – which reduce energy bills in the long-run but have high up-front costs – may be instructive in this regard.[14]

Indeed, there is much that can be learned about the importance of considering social alongside environmental issues from the evolution of the public and political debate on climate action. Throughout the 1990s and 2000s, climate change was largely framed in the European discourse as an environmental issue. Only in the last decade has the significance of social equity and justice considerations become mainstreamed as the implications of deep socio-economic transformation have become more evident.

Climate policymakers in both the public and private sectors now routinely refer to the importance of a 'just transition', recognizing this as key not just on ethical grounds but in terms of ensuring the

12 See, for example, Cambridge Econometrics and Bio Intelligence Service. 2016. Study on modelling of the economic and environmental impacts of raw material consumption. European Commission.

13 See, for example, Ellen MacArthur Foundation and the McKinsey Center for Business and Environment. 2015. Growth within: a circular economy vision for a competitive Europe. Ellen MacArthur Foundation.

14 Ugarte, S., *et al.* 2016. Energy efficiency for low-income households. European Parliament.

social acceptability of economic reforms. If the circular economy is to move from the sidelines to the centre of public and political debate, and if it is to signify a meaningful economic course correction towards absolute reductions in material throughput aligned with planetary boundaries, then it too must be built on principles of social justice.[15]

In what follows I seek to contribute to developing an analysis of the social implications of different circular and linear economic models. I do so by considering social impacts in two aspects in particular: the respect for labour rights and the quality of jobs created and destroyed in the circular transition on the one hand; and the accessibility for lower-income or marginalized households of the benefits of the circular economy on the other. I argue that social economy actors are uniquely well placed to advance social justice in both respects.

THE SOCIAL ECONOMY PUTS PEOPLE AT THE CENTRE

The social economy – sometimes referred to as the solidarity economy – is made up of a variety of enterprises and organizations that have at least two things in common: a participatory or democratic governance structure and an explicit social objective. Social economy actors can take a variety of legal forms – including cooperatives, mutuals, associations, foundations and social enterprises – and they can operate with a business model of reinvesting profits back into the organization or its social mission.[16] This form of economic model can be contrasted with the neoliberal model of governance based on shareholder primacy and short-term profit maximization[17] and with the social market model, which tempers the profit motive through

15 See also Brown, E., *et al.* Undated. The social economy: a means for inclusive and decent work in the circular economy? Report, Circle Economy.

16 Monzon Campos, J., and Avila, R. 2012. The social economy in the European Union. EESC.

17 Cipley, D. 2019. The neoliberal corporation. In *The Oxford Handbook of the Corporation*, edited by T. Clarke *et al*. Oxford University Press.

the establishment of a clear market governance role for social dialogue and institutions like collective bargaining (see Table 1).[18]

Social economy actors are widely recognized to have a number of strengths compared with other business forms. Firstly, they play a critical role in job creation, training and reskilling, in particular among people that are furthest from the labour market.[19] Secondly, they operate at a local level, with deep connections to communities, meaning that they are uniquely well placed to promote bottom-up social innovation and inclusion.[20] Thirdly, they are better equipped – in particular compared with firms operating under the principle of shareholder primacy – to take a long-term perspective, and as such are found to be more resilient. For example, the OECD has specifically recognized the critical role of the social economy in responding to the Covid-19 crisis, addressing urgent sanitary and social needs, and called for the social economy 'to develop a much larger role in the post-COVID phase to inspire transformation to a more inclusive and sustainable economy and society'.[21]

Table 1. Simplified comparison of three economic models.

	Neoliberal market economy	Social market economy	Social economy
Governance	Shareholder primacy	Social dialogue	Participatory or democratic
Purpose	Short-term profit maximization and shareholder returns	Profit maximization with social considerations	Social mission

18 Paragraph 3 of Article 3 of the Treaty on European Union refers to a 'highly competitive social market economy', which is generally understood to refer to a compromise between free markets on the one hand and social-oriented policies (including social dialogue) on the other. See, for example, Smejkal, V., and Saroch, S. 2014. EU as a highly competitive social market economy: goal, options and reality. *Review of Economic Perspectives* 14(3) (https://doi.org/10.1515/revecp-2015-0006).

19 OECD. 2013. Job creation through the social economy and social entrepreneurship. OECD.

20 OECD. 2007. The social economy: building inclusive economies. OECD.

21 OECD. 2020. Social economy and the COVID-19 crisis: current and future roles. OECD

THE SOCIAL-CIRCULAR ECONOMY NEXUS

In this section I seek to go beyond the existing circular economy literature by combining analysis of the degree of circularity in economic models with consideration of the different forms of market governance, from neoliberal free markets through social market governance to the social economy, assessing their implications both in terms of respect for labour rights and in terms of inclusivity or the degree of accessibility of goods and services for lower-income or marginalized households. I identify five 'ideal type' economic models on this basis (as depicted in Figure 2), which are briefly explored here. It is important to note that versions of each can be found concurrently in many EU member states today.

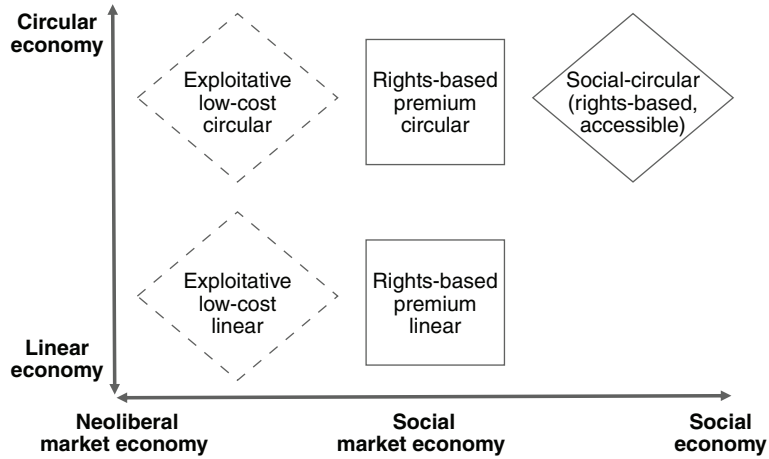

Figure 2. Economic model typology based on the degree of circularity and form of market governance. Diamonds represent models whose benefits are more accessible to lower-income or marginalized households; squares represent models whose benefits are more exclusive; dashed lines represent models that rely on more exploitative labour conditions; solid lines represent models based on greater respect for labour rights.

In the bottom-left corner of Figure 2, the **exploitative low-cost linear** type describes the neoliberal economic model that has become widespread across much of Europe in the last twenty to

thirty years. In this model, labour market deregulation drives production of cheap and often disposable mass-market goods to sustain consumer-driven macroeconomic growth and short-term profit maximization by firms. Low consumer prices – for everything from food to electronics and fast fashion – combined with easy access to cheap credit has arguably been central to maintaining the social acceptability of the economic model in the context of a long period of stagnant wages for much of the working population.

Labour exploitation is evident at both ends of the value chain in this model. Beyond Europe's borders, violations of human and labour rights are widespread in the extraction of raw materials, such as child labour in mining for metals like cobalt and coltan that are vital for electronic devices.[22] In the fast fashion sector, exploitation is evident from the people picking cotton[23] to the workers – overwhelmingly women – sewing clothes in the supply chains of European fast fashion retailers in factories in Southeast Asia.[24]

Here in Europe, exploitation is alleged in the warehouses of e-commerce giants.[25] Such companies have driven down costs through enormous economies of scale as they seek to supply almost any conceivable consumer product at low cost within days – outcompeting local retailers – and through labour policies that allegedly include low wages, unattainable productivity targets and antagonism towards unions.[26] To the extent that a more circular economy drives down aggregate demand for raw materials, and increases prices for the materials that are used, it holds the promise of leaving behind the exploitative labour conditions that underpin such low-cost linear value chains.

22 ILO. 2019. Child labour in mining and global supply chains. ILO.

23 Moulds, J. 2015. Child labour in the fashion supply chain: where, why and what can be done. *The Guardian*.

24 D'Ambrogio, E. 2014. Worker's conditions in the textiles and clothing sector: just an Asian affair? Issues at stake after the Rana Plaza tragedy. European Parliamentary Research Service.

25 Spartari, M. 2019. E-commerce: recent trends and impact on labour. UNI Commerce Global Union.

26 Ibid.

However, there is nothing about more circular business models that a priori means they will be based on greater respect for labour rights. In the upper-left corner of Figure 2, the **exploitative low-cost circular** type reflects ongoing exploitative practices in sectors considered critical to the circular transition. As mentioned earlier, poor working conditions are endemic in the waste-treatment sector, in which most of the new jobs in a circular economy are projected to be created. The sector is a hotspot of health and safety concerns for workers, for example, with the risk of accidents estimated to be 2.5 times higher than in other sectors,[27] and it is marked by low pay, precarious contracts, uneven worker representation and widespread informality.[28] Again, the problem here goes beyond Europe's borders, to the countries to which Europe has exported its waste, where waste-treatment sectors are overwhelmingly informal and marked by health and safety concerns and a lack of labour standards and rights.[29]

At the other end of the value chain, exploitation is also widespread in many of the platforms of the new sharing and product-as-a-service economy. For example, ride-sharing and food delivery apps have reached mass-market appeal, and they may be seen to contribute to the avoidance of car ownership or to a reduction in food waste, for example, but their drivers may lack core labour rights, such as rights to paid holidays or social security contributions.[30] So long as market governance is organized on neoliberal terms, there is a risk that the price of the circular transition will be borne by workers.

27 Weghmann (2017). Waste management in Europe.

28 Ibid. See also van den Berge, J. 2014. Working towards decent 'green' jobs in the waste industry. *HesaMag* 9, ETUI.

29 See, for example, Lundgren, K. 2012. The global challenge of e-waste: addressing the challenge. International Labour Organization. WIEGO. 2019. New project explores how waste pickers can help solve the ocean plastics waste crisis. WIEGO Blog.

30 Das, S. 2017. The sharing economy creates a Dickensian world for workers – it masks a dark problem in the labour market. *The Independent*. Schor, J., and Atwood-Charles, W. 2017. The 'sharing economy': labor, inequality and social connection on for-profit platforms. *Sociology Compass* 11.

Where more social market forms of governance are evident – including, notably, the presence of strong institutions of collective bargaining – we can identify more favourable working conditions. In the lower right-hand corner of Figure 2, the **rights-based premium linear** type characterizes decent work in sectors like manufacturing that are reliant on high-grade, industrial jobs, in which collective bargaining agreements are more widespread, or in parts of the retail sector, for example. These are sectors associated with producing higher-end, more premium products, such as cars or higher-quality and more energy-efficient home appliances, albeit usually at higher consumer prices, which tend to be inaccessible to lower-income or marginalized households.

While such products are often more durable than the outputs of the low-cost linear economic model, they can nonetheless be considered part of an essentially linear economy, designed around the private ownership of replaceable, resource-intensive consumer goods, with minimal scope for material recycling or recovery. The car industry, for example, has been built on consumer demand – created through marketing activities – for new or upgraded cars. While most households that can afford one or more cars will tend to keep them rather longer than the average lifespan of a mobile telephone, the industry nonetheless relies on eventual replacement with a new vehicle. A separate market for second-hand vehicles in turn satisfies demand from less-affluent households, simply adding to the stock of materials in the economy. Given this reliance on unsustainable practices, at least some of the decent jobs in these sectors will therefore be at risk in a transition to a more circular economy

One option, therefore, is to adopt this social democratic model of market governance for circular business models. Doing so will likewise have evident advantages in terms of ensuring that workers' rights are respected; but to the extent that decent work (and scarcer, more expensive materials) is reflected in higher consumer prices, lower-income or marginalized households may quickly be excluded from the benefits of the circular transition. The low-carbon transition can be instructive in this regard, if we think of the

way only higher-income households are currently able to afford the installation of solar roof panels or to make energy-efficiency retrofits to their homes, for example.[31] The **rights-based premium circular** type characterizes this economic model, examples of which can be found in the relatively high prices for using for-profit carpool schemes, such as the one developed by Volvo as a major new business model alternative to selling cars, but whose prices – and geographic placement of cars – are unlikely to be widely accessible to lower-income or rural communities.[32]

This is not to suggest that all circular business models necessarily involve either exploitative working conditions or premium prices that exclude lower-income or marginalized households. A company like Hygglo – a Swedish start-up that facilitates the rental of products from other owners, helping to avoid the need for new purchases – is a case in point. But this kind of platform company only employs a few staff. The big question remains whether truly rights-based and accessible circular models can be operationalized in labour-intensive sectors. Certainly, some pioneer companies are experimenting in this regard. Notably, Ikea has stated its intention of creating low-cost, accessible furniture sold in a modular, repairable form or rented as a service to customers.[33] In the textiles sector, companies such as H&M and Zara, which typify the low-cost, fast fashion sector, are experimenting with return and recycling schemes.[34]

But the big question for such companies remains whether their long-term business model is consistent with an aggregate reduction in material demand in the economy, and with full respect for labour rights not only at the retail end of the value chain but in the material extraction and processing stages as well. Until these questions

31 Schleich, J. 2019. Energy efficient technology adoption in low-income households in the European Union: what is the evidence? *Energy Policy* 125.

32 See https://m.co/se/en-US.

33 Fleming, S. 2021. IKEA fits in a world that wants to buy less, says Ingka Group's CEO. World Economic Forum.

34 Gould, H. 2017. Zara and H&M back in-store recycling to tackle throwaway culture. *The Guardian*.

can be answered, the jury remains out on the viability of a truly circular, accessible and rights-based economic model in labour-intensive sectors based on traditional social democratic forms of market governance.

An alternative option, however, can already be found in the social economy, characterized here as the **social-circular** type. As discussed above, the social economy is made up of economic actors that are characterized both by having an explicit social purpose in place of an explicit profit motive and by having a democratic or participatory form of governance. This means that workers' rights are afforded far greater protection in this model, which has been consistently recognized also for its advantages in engaging people that are furthest from the labour market. Similarly, the absence of a profit motive or the pressure to generate short-term shareholder returns, and the social mission of such actors, means that products or services can be provided at low or no cost, greatly increasing accessibility for lower-income or marginalized households.[35]

While there are no doubt examples of social economy actors that operate in the linear economy (not explored as a separate type here), it is certainly the case that social economy actors are already widely present in sectors that are critical to the circular economy transition, notably in recycling, refurbishment, repair and second-hand retail. For example, the international RREUSE network represents more than 100,000 employees, trainees and volunteers from social enterprises in the field of reuse, repair and recycling across Europe and the United States.[36] Several further examples are described below.

OPPORTUNITIES AND RISKS FOR THE SOCIAL ECONOMY IN THE EU'S CIRCULAR TRANSITION

On the one hand, the circular transition should therefore offer substantial opportunities for social economy actors to thrive, with

35 See also Brown *et al.* (undated). The social economy.

36 See www.rreuse.org/about-us.

increasing demand for the recycling, repair and resale services in which they have clear advantages. These opportunities are recognized, albeit briefly and somewhat ambiguously, in the EU Circular Economy Action Plan (CEAP), which points to 'the potential of the social economy, which is a pioneer in job creation linked to the circular economy [and that should be] further leveraged by the mutual benefits of supporting the green transition and strengthening social inclusion, notably under the Action Plan to implement the European Pillar of Social Rights'.[37]

The Action Plan to implement the European Pillar of Social Rights in turn recognizes the 'new opportunities [that] will … stem from the social economy, which creates jobs while addressing key societal challenges in a wide range of sectors, often through social innovation', and it announces an Action Plan on the Social Economy (APSE), due to be adopted in the fourth quarter of 2021, that is designed to 'tap into the potential of the social economy to create quality jobs and contribute to fair, sustainable and inclusive growth'.[38]

However, the shift to more circular economic models also creates significant risks to social economy actors in the absence of a supportive policy environment. For example:

- innovation and experimentation by large clothing or furniture firms with recovery, reuse, recycling or rental schemes may pose a major threat to the feedstocks of many social economy actors;
- producer responsibility for the repair of electronic or other appliances may lock out social economy actors, if they are unable to afford or acquire licenses, manuals or replacement parts; and
- the professionalization of waste collection and treatment services envisaged in the CEAP – while designed in part to address

37 European Commission. 2020. A new Circular Economy Action Plan: for a cleaner and more competitive Europe. COM (2020) 98, European Commission.

38 European Commission. 2021. The European Pillar of Social Rights Action Plan. COM (2021) 102, European Commission.

significant public health concerns associated with the recycling of hazardous materials – may unintentionally undermine the informal or social economy actors that offer the best examples of social innovation in the sector.

Without due care to the type of economic model underpinning the circular transition, the irony is that it may inadvertently displace the very actors that best characterize an alternative, materially efficient, labour-intensive and truly inclusive economy. If EU policymakers are committed to bringing together the EU's social, low-carbon and circular objectives, it is vital that key aspects of the circular economy policy agenda are explicitly designed to protect and grow the social economy. Table 2 below outlines some of the opportunities and risks for the social economy in the CEAP, identifying some of the key challenges policymakers must address in this regard.

CONCLUSIONS AND RECOMMENDATIONS

Social justice issues have been largely overlooked in the circular economy discourse to date, but this must now change. While the circular transition could promise the end of the exploitative labour conditions that underpin low-cost, linear value chains, without more attention to social considerations there is no guarantee that a circular economy will be based on respect for labour rights or that its benefits will be accessible to lower-income and marginalized households.

The form of governance of the circular economy will largely determine these social outcomes, and social economy actors are uniquely well placed to deliver in both respects. The EU should embrace a social-circular economic model, advancing this agenda through the implementation of both the APSE and the CEAP:

- Under the APSE, the European Commission should prioritize the promotion of sectors that are key to the circular transition, such as buildings, mobility, food waste and electronics.
- Under the CEAP, the European Commission should ensure minimum targets in EPR schemes to channel high-value recycled

materials through social economy actors; ensure that licensing, warranties and access to spare parts do not exclude social economy actors from the repair economy; promote social clauses in Green Public Procurement schemes that support service provision by social economy actors; deliver the EU-wide electronics take-back scheme through social economy actors only; roll out waste-separation communications and engagement through social economy actors; and use 'Recycled in EU' as a benchmark not only of material quality but also of labour rights in the EU recycling sector.

Table 2. Opportunities and risks for the social economy in the EU Circular Economy Action Plan (CEAP).

Circular Economy Action Plan initiatives	Opportunities for the social economy	Risks to the social economy
REPAIR		
The EC aims to establish a **'right to repair'**, with consideration for the availability of spare parts, and access to repair services and software upgrades. Electronics and ICT will be a priority sector, under the **Circular Electronics Initiative**, while the **EU Strategy for Textiles** will include the aim to empower business and private consumers to have easy access to reuse and repair services.	Could spur significantly increased demand for repair services offered by social economy actors, such as Community Repair Organizations (CROs) or repair cafes.	Social economy actors will be excluded from the repair economy if licenses for repair services for electronic and ICT devices are restricted to highly professionalized actors, if spare parts and manuals are restricted or if repair services are kept in-house by brands.
REUSE		
The EC will promote the reuse of products and incentivize product-as-a-service models. For example, the **Strategy for Textiles** will support the market for textile reuse and provide incentives to product-as-a-service models; the **Strategy for a Sustainable Built Environment** will promote measures to improve the durability and adaptability of buildings; and the **Strategy on Sustainable and Smart Mobility** will encourage product-as-a-service solutions to reduce virgin materials, optimize vehicle use and increase occupancy rates.	Could spur significantly increased demand for second-hand clothes retailers in the social economy. Buildings could be repurposed for social economy purposes, such as the project supported by Life+ to repurpose a public boiler house in Ireland into a community hub targeting lifelong learning programmes in the waste sector.[1] Could incentivize social economy start-ups to provide accessible product-as-a-service models in the mobility sector, such as the Mobility cooperative in Switzerland[2] or the UP Bikeshare app in the Philippines.[3]	Product-as-a-service models operated by major clothing brands could undermine textiles feedstocks for second-hand clothes retailers in the social economy. Commercial actors in the construction or mobility sectors could squeeze out social economy actors, e.g. by buying up the most attractive building redevelopment opportunities or by establishing near-monopoly ownership of parking spaces in certain areas.

[1]See https://circulareconomy.europa.eu/platform/en/good-practices/ballymuns-boiler-house-now-3d-textbook-reuse. [2]See www.mobility.ch/en/mobility-cooperative. [3]Mayuga, K. 2021. Bikeshare at UP Diliman: a glimpse of sustainable transport for cities. *Philstar Global*.

Table 2. Continued.

Circular Economy Action Plan initiatives	Opportunities for the social economy	Risks to the social economy
RECYCLE		
The EC will make substantial efforts to improve and harmonize separate waste collection systems and standardize secondary raw materials markets, including implementing extended producer responsibility schemes, increasing consumer involvement, tracking hazardous substances and establishing a 'Recycled in EU' quality benchmark. For example, the **Circular Electronics Initiative** will aim to increase collection of e-waste, including by exploring an EU-wide take-back scheme for mobile phones, tablets and chargers; the **Strategy for Textiles** will encourage industrial applications for recycling and extended producer responsibility schemes; the **Strategy for a Sustainable Built Environment** will consider revising material recovery targets for construction and demolition waste, with particular attention to insulation materials; the **Farm to Fork Strategy** will establish new targets for the reduction of food waste; and the EC will consider introducing new measures to improve recycling rates of **batteries** and revising the rules on **end-of-life vehicles**.	Efforts to make waste separation more accessible to households could increase demand for the social innovation and deep community links of social economy actors. The 'Recycled in EU' benchmark could be formulated to represent full respect for labour rights and social employment principles in the recycling industry, as well as material quality. The proposed 'EU-wide take back scheme' could be delivered through social economy actors, in part as an opportunity to establish community outreach around circular economy initiatives more widely, linked for example to the expansion of CROs and new waste-separation approaches. Could increase demand for social enterprises in buildings disassembly and preparation for reuse (such as the Baukarussel project in Austria,[1] community paint reuse schemes, or the Sociaal Atelier 'building materials bank' in Belgium[2]) and for social economy actors in urban mining (such as the Coopcent-ABC cooperative in Brazil[3]) and food waste (such as peer-to-peer food sharing apps, or social agriculture schemes).	Harmonization and standardization of the waste-treatment sector – in particular with regard to the handling of hazardous substances (including e-waste, batteries and certain construction materials, for example) – could lead to professionalization that excludes informal and social economy actors. The high value of electronic waste could lead to commercial actors capturing the market for urban mining. Return schemes operated by major clothing brands could undermine textiles feedstocks for second-hand clothes retailers in the social economy. Large construction firms could out-compete social economy actors on price for waste recycling efforts involving disassembly and demolition.

[1]See www.baukarussell.at/about-us/. [2]Marin, J., *et al.* 2020. A materials bank for circular Leuven: how to monitor 'messy' circular city transition projects. *Sustainability* 12. [3]Gutberlet, J. 2015. Cooperative urban mining in Brazil: collective practices in selective household waste collection and recycling. *Waste Management* 45.

What's next for circular economy policy internationally?

By Dr Amelia Kuch and Carsten Wachholz

FROM BETTER WASTE MANAGEMENT TO SUSTAINABLE CONSUMPTION AND PRODUCTION

Evolution of circular economy policy discussions in the EU

Over the past decade, the concept of the circular economy has gained increasing attention from actors in academia, business and policymaking. Within the EU, the circular economy has evolved from its initial focus on minimizing waste generation into a more comprehensive approach to resource use. From the initial Roadmap for a Resource-Efficient Europe to the first Circular Economy Action Plan (CEAP), to the European Green Deal, which includes a new CEAP, the European Commission has gradually raised its level of ambition and broadened the scope for action for accelerating the transition to the circular economy. These initiatives have turned the circular economy from a niche concept into part of the mainstream agenda and a top policy priority.

The development of circular economy policy discussions in the EU context can be divided into three phases.

1. A waste management phase, in which waste as the output of production and consumption was acknowledged as a problematic source of pollution (1970–90).
2. An eco-efficiency phase, in which the problem focus was expanded to also incorporate the connection between natural resource consumption and environmental degradation (1990–2010).
3. A resource-efficiency phase, in which the environmental dimension was increasingly connected with the prospect of economic

benefits stemming from decreasing resource input and waste output (started in 2010).[1]

Proliferation of national, regional and sectoral circular economy strategies internationally

In Europe, the number of circular economy strategies at all levels of governance is growing, and the European Economic and Social Committee has estimated that the total number of circular economy strategies was more than sixty by the end of 2019.[2] In North America, the Canadian government has commissioned the Council of Canadian Academies to assess opportunities for a national circular economy, and the United States's House Select Committee on the Climate Crisis has recommended the development of a circular economy road map. In Latin America and the Caribbean – following the fourth United Nations Environment Assembly (UNEA-4), in 2019 – a regional coalition of national governments, international institutions and strategic partners is being developed to share best practices and accelerate the transition across the continent. Across Asia and Oceania, several national government initiatives are integrating a circular economy approach, with policy objectives on sustainable production and consumption as well as economic development and improved well-being. The circular economy is also garnering attention in this region as a response to global environmental challenges, including plastic pollution. The African Circular Economy Alliance has established a secretariat hosted by the African Development Bank to unlock development funding in line with circular economy principles. This proliferation of circular economy strategies globally demonstrates growing momentum for accelerating the transition to the circular economy.

1 Reike D., Vermeulen, W. J. V., and Witjes, S. 2018. The circular economy: new or refurbished as CE 3.0? Exploring controversies in the conceptualization of the circular economy through a focus on history and resource value retention options. *Resources, Conservation and Recycling* 135, 246–264.

2 European Economic and Social Committee. 2019. Circular economy strategies and roadmaps in Europe: identifying synergies and the potential for cooperation and alliance building..

The circular economy in the international policy discussion

The circular economy is also gaining prominence in international policy discussions, and there is increasing recognition of the centrality of a circular economy to the delivery of the UN's Sustainable Development Goals (SDGs), namely SDG 12, on sustainable consumption and production. At least eleven additional SDGs – such as SDG 9, for inclusive, sustainable industrialization, together with innovation and infrastructure – would be positively impacted by a transition to a circular economy.

At UNEA-4 in 2019, the EU advocated including the circular economy concept in the discussions on sustainable consumption and production in the United Nations Environment Assembly resolutions. As a consequence, there are now multiple references to the circular economy in the resolution on 'Innovative pathways to sustainable consumption and production' and also in the related ministerial declaration.[3] The resolution references the critical contribution that a circular economy approach can offer in achieving sustainable consumption and production in line with the SDGs.

This example shows that the EU is actively promoting the circular economy internationally, using various bilateral mechanisms to achieve that, including the EU–China Memorandum of Understanding on Circular Economic Cooperation[4] and the recent EU–India Joint Declaration.[5] Under the latest Circular Economy Action Plan, the Commission has also proposed the creation of a global alliance for the circular economy. In February 2021, the Global Alliance on Circular Economy and Resource Efficiency (GACERE) was created, bringing together governments and relevant networks and organizations.[6] It was initiated by the European Commission,

3 InforMEA. 2019. Innovative Pathways to Achieve Sustainable Consumption and Production.

4 European Commission. 2019. EU and China step up their cooperation on environment, water and circular economy.

5 European Commission. 2020. EU and India partner for resource efficiency and circular economy.

6 The Global Alliance on Circular Economy and Resource Efficiency (GACERE) launch event (February 2021).

on behalf of the EU, and by the United Nations Environment Programme (UNEP), in coordination with the United Nations Industrial Development Organization (UNIDO).

The Alliance aims to provide a global impetus for initiatives related to the circular economy transition, resource efficiency and sustainable consumption and production, building on efforts being deployed internationally. GACERE members and strategic partners will do this by working together and advocating at the political level and in multilateral forums, in particular at the United Nations General Assembly (UNGA), the United Nations Environment Assembly (UNEA) and the Group of Seven (G7) and Group of Twenty (G20) meetings. Eleven individual countries (Canada, Chile, Colombia, Japan, Kenya, New Zealand, Nigeria, Norway, Peru, Rwanda and South Africa) and the EU have joined the Alliance to date. The launch event of the platform, held on 22 February 2021, put the emphasis on taking the circular economy framework beyond its waste and resource management dimensions and stressed the importance of structural reforms (e.g. around the pricing of externalities) in tackling the drivers of global challenges such as climate change and biodiversity loss.

International forums are increasing their focus on the circular economy

These activities initiated by the EU have been running in parallel with G7 and G20 environment ministers increasing their focus on the circular economy and resource-efficiency approaches since 2015 for the G7 and since 2017 for the G20.[7] For example, when G20 leaders gathered in Osaka, Japan, in June 2019, they recognized the positive contribution of resource-efficiency policies and approaches such as the circular economy to fulfilling the SDGs, tackling environmental challenges, enhancing competitiveness and economic growth, managing resources sustainably and creating jobs.[8]

7 URL: https://g20re.org/; www.g7are.com.

8 MOFA. 2019. G20 Osaka Leaders Declaration.

The role of trade in promoting and enabling the circular economy has also started to be explored in World Trade Organization (WTO) settings, following discussions at the 2018 WTO Public Forum and the 2019 Environment Week. The focal point for policy dialogue on trade and environmental sustainability at the WTO is the Committee on Trade and Environment (CTE). Recently, CTE participants have shown a growing interest in the trade aspects of a circular economy.[9] In November 2019, the BRS (Basel, Rotterdam and Stockholm) Conventions secretariat briefed CTE participants on the results of the 2019 Basel Conference of the Parties, including the decision to amend the Basel Convention to include plastic waste in a legally binding international policy framework.[10]

In 2020, as a step towards inclusive and sustainable industrialization, UNIDO started a process of consultations on the circular economy with its 170 member states, with a view to facilitating exchanges on best practices, emerging innovations and the promotion and implementation of circular economy principles in industrial applications. The objective of the consultations is to consider ways and means to promote circular economy principles and practices, particularly in developing countries.

Essential next steps for the evolution of circular economy policy internationally

In terms of the future development of circular economy policy internationally, it is essential to include more economic considerations to influence decisions on material choices, product design, and business and service models upstream in the value chain. Although the circular economy is gaining prominence among regional, national and international policymakers, the majority of reported policy initiatives related to the circular economy are fragmented and mostly focus on waste management, with only a few examples going beyond increasing recycling rates and a higher use of secondary raw materials. This

9 Steinfatt, K. 2020. Trade policies for a circular economy: what can we learn from WTO experience? Working Paper, World Trade Organization.

10 Ibid.

clearly shows that there is still a need to push the upstream components of new production and usage models in the circular economy to the fore.

As governments develop circular economy road maps and strategies, both economy-wide and sector-based, it will be critical to agree on a clear direction of travel that reduces fragmentation and complexity, includes considerations for the need for upstream innovations, and takes into account the global nature of supply chains and production and consumption systems. Recognizing this momentum and identifying the need for alignment, the Ellen MacArthur Foundation has set out five universal circular economy policy goals that provide a framework for national governments, cities and businesses to create a transition that fosters innovation and decouples growth from finite resource consumption and environmental degradation.

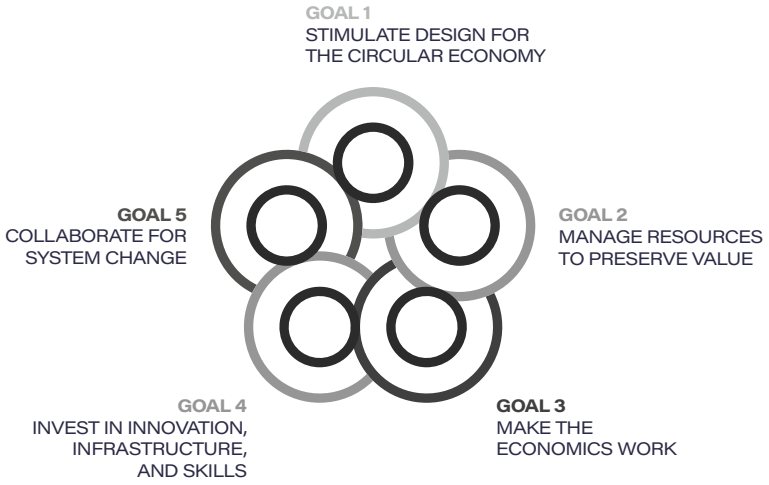

Figure 1. Ellen MacArthur Foundation, universal circular economy policy goals (2021).

Goal 1 ('Stimulate design for the circular economy') looks at how policy can incentivize the switch to circular design practices and circular business models at scale and across sectors. While Goal 1 supports the transition to circular design, production and business models, Goal 2 ('Manage resources to preserve value') focuses on

developing a functioning system of resource management that keeps these goods and materials in productive use and at high value. These two policy goals go hand in hand and reinforce each other.

To support the development of the resource flows that are the focus of Goals 1 and 2, Goal 3 ('Make the economics work') focuses on creating the necessary economic conditions to scale circular outcomes. Goal 4 ('Invest in innovation, infrastructure, and skills') focuses on using public finance capabilities to invest in circular economy opportunities and skills and mobilize private investment. Finally, to achieve an economy-wide transition to a circular economy, new international alignment and collaboration mechanisms will be needed. Goal 5 ('Collaborate for system change') focuses on the 'how' of policymaking for system change – the mechanisms for developing new policies and aligning existing ones in order to unlock a systemic, economy-wide transition to a circular economy.

Aligning actions around these goals can accelerate the transition while avoiding fragmentation as a multitude of corporate efforts and government road maps are drawn up.[11]

THE NEED FOR INTERNATIONAL ALIGNMENT AS THE CIRCULAR ECONOMY MOVES INTO THE POLITICAL MAINSTREAM

The need to address fundamental waste management issues has been the initial driver for circular economy efforts in many countries, often making environment ministries the champions of the circular economy agenda. However, in addition many other ministries have a key role to play in driving the transition, such as those responsible for industrial policy and economic affairs, finance, planning, agriculture and forestry, and education. This increases the importance of establishing greater inter-ministerial coordination and coherence between policy measures, bridging the traditional silos. A cross-government, inter-ministerial process can help make circular economy principles a core part of different policy portfolios, helping to deliver

11 Ellen MacArthur Foundation. 2021. Universal circular economy policy goals.

a transition in which the policy signals from different areas align.[12] In 2016 the Netherlands adopted a target of transitioning to a fully circular economy by 2050, supported by a government-wide programme.[13] Given the coordination and alignment required, central government leadership can provide the overarching direction.[14]

This integration extends to international policies as much as national and sub-national policies.[15] Integrating circular economy principles into international economic policies, such as trade agreements, can support the cross-border movement of goods. Similarly, embedding circular economy concepts into international development projects can contribute to capacity and infrastructure development in aid-receiving countries. This approach is already being implemented in the SWITCH to Green Facility, which supports cooperation between the EU and its international partners.

The harmonization of waste classification definitions can support keeping safe and valuable resources in use. Such alignment can also involve creating commonality across different policies and schemes that target the same sector or value chains, e.g. through product policies, information labels, industrial standards and extended producer responsibility (EPR) schemes to facilitate the collection and sorting of discarded items. Collaboration between environmental authorities, market surveillance and customs can help to reduce transaction costs and improve the effectiveness and enforcement of such policies.

Forums and exchanges within or outside institutional settings can identify alignment opportunities and policy barriers that policymakers can address at the national, regional and international levels. The United Nations Environment Assembly is a testament to this, and so is the recently established GACERE. Region-level examples include the European Circular Economy Stakeholder Platform,[16]

12 Government of Finland, Ministry of Environment. Circular Economy.
13 Government of the Netherlands. Circular Economy Programme.
14 Ellen MacArthur Foundation. Universal circular economy policy goals.
15 OECD. Circular economy in cities and regions. Ellen MacArthur Foundation. Circular economy in cities. ICLEI. Our pathways, our approach.
16 European Circular Economy Stakeholder Platform (https://circulareconomy.europa.eu/platform).

the African Circular Economy Alliance[17] and the Latin American and Caribbean Circular Economy Coalition,[18] among others. Bilateral exchanges and agreements further support the development of cross-border opportunities.[19]

The principles of the circular economy are also being applied by an increasing number of the world's largest businesses from across different sectors and value chains. Private sector investment in circular economy opportunities is also rising sharply, with, for example, the assets under management in public equity funds dedicated to the circular economy having grown fourteen-fold in 2020 alone.[20] As circular economy policy moves into the mainstream, new mechanisms that bring together both private and public stakeholders will be needed. One example is multi-stakeholder industrial alliances that can help remove barriers to innovation and improve policy coherence. They can draw on the knowledge of SMEs, larger companies, researchers and policymakers across all levels of government. Such alliances can also help steer innovation work and finance large-scale projects with positive spillover effects.

The Ellen MacArthur Foundation's Plastics Pact Network is one such example of a globally aligned response to plastic waste and pollution that enables vital knowledge sharing and coordinated action. It is a network of national and multi-country initiatives that brings together key stakeholders to implement solutions towards a circular economy for plastics, tailored to the national or regional situation.

Although circular economy policies and initiatives largely take place at the national or regional level at the moment, they have important interlinkages with international trade. Interlinkages between international trade and the circular economy come into play in the areas of global supply chains, trade in services, trade in second-hand goods, trade in goods for refurbishment and remanufacturing, trade in waste for recycling, and trade in secondary raw materials, among

17 African Circular Economy Alliance (www.aceaafrica.org).

18 UN Environment Programme. 2021. Circular Economy Coalition launched for Latin America and the Caribbean.

19 Ellen MacArthur Foundation. Universal circular economy policy goals.

20 Ibid.

other areas. Trade is therefore increasingly seen as an international policy area in which further integration of the circular economy and progressive policymaking will be needed.

HOW THE CIRCULAR ECONOMY WILL IMPACT RESOURCE MANAGEMENT AND INTERNATIONAL TRADE

The circular economy in trade agreements to date

The debate on trade and the environment has evolved considerably since the WTO was created in 1995. Since the 1990s, understanding about the interconnections between trade, the economy and the environment has become more established, and the importance of trade policy supporting environmental outcomes has increased. Given these developments, the interface between trade and circular economy policies is increasingly attracting the attention of both trade negotiators and policymakers.[21] At the moment, provisions related to the circular economy are found in references to the Basel Convention, specific provisions on food waste (i.e. USMCA) or in specific articles on remanufactured goods (i.e. the EU–Vietnam Free Trade Agreement).

Although it is expected that in the future the circular economy will be more frequently included in the sustainable development chapters of the EU's Free Trade Agreements (FTAs), circular economy provisions have been limited to date, and there are no concluded agreements that include direct reference to the circular economy.[22]

21 Circular economy linkages were discussed at the WTO Public Forum in October 2018, the WTO Committee on Trade and Environment in November 2019, and the World Circular Economy Forum in October 2018 and June 2019. In February 2020, the OECD organized a two-day workshop on international trade and the circular economy to establish a multi-stakeholder dialogue.

22 Pardo, R., and Schweitzer J. P. 2018. A long-term strategy for a European circular economy: setting the course for success. Policy paper produced for the Think2030 Project.

There are, however, agreements that are currently in negotiation or awaiting ratification that include environmental provisions that refer to the circular economy in their provisional text.[23] These include the trade part of the EU–Mexico Global Agreement,[24] the EU–New Zealand FTA,[25] the EU–Mercosur FTA, the EU–Chile FTA and the EU–Australia FTA.[26] There is also a potential opportunity to advance the circular economy agenda as part of the Sustainable Impact Assessments (SIAs) for trade agreements under negotiation, including in the EU–Malaysia FTA and the EU–Philippines FTA.[27] Driven by these developments, policymakers and researchers are exploring the impacts of the circular economy on international trade, global value chains and material flows.

Global value chains and material flows

The existing evidence highlights the potential impacts of the transition on a number of trade flows, including primary raw materials, services, second-hand goods, goods for refurbishment and remanufacturing, waste and scrap for recycling, and secondary raw materials.[28] Close monitoring of material flows through tools such as the

23 Yamaguchi, S. 2021. International trade and circular economy: policy alignment. OECD Trade and Environment Working Papers No. 2021/02, OECD.

24 Modernisation of the Trade part of the EU–Mexico Global Agreement, Trade and Sustainable Development Chapter, Article 13 (as of 23 April 2018) (https://trade.ec.europa.eu/doclib/docs/2018/april/tradoc_156791.pdf).

25 EU's proposal for the EU–New Zealand FTA, Trade and Sustainable Development Chapter, Article 5 (as of 15 February 2019) (https://trade.ec.europa.eu/doclib/docs/2019/april/tradoc_157866.pdf).

26 EU's proposal for the EU–Australia FTA, Trade and Sustainable Development Chapter, Article 5 (as of 25 February 2019) (https://trade.ec.europa.eu/doclib/docs/2019/april/tradoc_157865.pdf).

27 Kettunen, M., Gionfra, S, and Monteville, M. 2019. EU circular economy and trade report: improving policy coherence for sustainable development. IEEP, Brussels/London.

28 Yamaguchi, S. 2018. International trade and the transition to a more resource efficient and circular economy: a concept paper. OECD Trade and Environment Working Papers No. 2018/03, OECD.

International Resource Panel's Global Material Flows Database will be critical for informed decision-making regarding circular value chains.[29] It will also be important to nuance the distinctions between countries that are net importers of raw materials and raw-material-exporting countries and between the different trade provisions those countries might need.[30]

For example, the recent import bans introduced by China, among other countries,[31] have exposed the tension between the EU's exports of plastic waste for recycling and its ambitious recycling targets for plastic packaging. It is now evident that problematic waste exports – such as those of low-value plastic and textile waste as well as e-waste exported for reuse – can lead to negative environmental and social impacts in other countries if no control mechanisms are put in place. What is needed for enabling a safe and mutually beneficial trade in secondary resources is provisions for the receiving country to have the capabilities and capacities to treat these types of products and waste materials in an appropriate manner. In its resolution of 10 February 2021 on the new Circular Economy Action Plan, the European Parliament supported the Commission's ambition to revise the Waste Shipment Regulation in order to ensure transparency and traceability for intra-EU trade in waste, to halt the export to third countries of waste that causes damage to the environment or human health, and to tackle unlawful behaviour more effectively with the aim of ensuring that all waste is treated in accordance with circular economy principles.

29 United Nations Environment Programme's Environment and Trade Hub/ International Resource Panel. 2020. Sustainable trade in resources: global material flows, circularity, and trade.

30 Dellink, R. 2020. The consequences of a more resource efficient and circular economy for international trade patterns: a modelling assessment. OECD Environment Working Papers No. 165, OECD.

31 Following China's ban on waste imports in 2017, India banned imports of solid plastic waste in March 2019. Similarly, Thailand has announced a halt to all imports of plastic waste by 2021, and Vietnam and Malaysia also have plans in place to reduce permits for imports of plastic waste.

Mechanisms for action

The existing research identifies three key mechanisms for action that can support better policy coherence between trade and the circular economy.

1. The first action will be to align circular economy policies and trade policies in order to make them mutually supportive.[32] This can be done by mapping potential contradictions and conflicts between trade policies and circular economy policies and by identifying potential future barriers and unintended consequences. This type of mapping should focus on the multilateral trade regime and regional trade agreements, as well as on specific policies to promote the circular economy, such as extended producer responsibility and product stewardship schemes, taxes and subsidies, Green Public Procurement, environmental labelling schemes and standards. The mapping will improve the collective understanding of how trade interacts with the circular economy.
2. The second mechanism encompasses improving the scope and implementation of trade agreements.[33] Some trade agreements explicitly cover trade related to specific economic sectors such as electronics or textiles. In such agreements, there is an opportunity to integrate circularity aspects into sector-specific principles and regulatory actions. This will help to mainstream the circular economy at a sectoral level and beyond solely environmental considerations. Another area for improving the scope and implementation of agreements could involve promoting trade in certain products and services within a sector (e.g. environmental goods and services) or strengthening the EU regulatory frameworks linked to sector-specific trade.[34]

32 Yamaguchi (2021). International trade and circular economy.

33 Kettunen, Gionfra and Monteville (2019). EU circular economy and trade report.

34 Ibid.

3. Finally, the third area includes addressing the lack of international standards and definitions.[35] The ability of trade regimes to distinguish between unwanted waste or obsolete goods on the one hand and goods, components and materials needed for circular economy activities on the other will be essential. International standards and definitions could also help build trust and confidence for engaging in mutually beneficial activities related to the circular economy. Moreover, imprecise definitions and a lack of shared standards can lead to overly broad import bans, which can result in large amounts of valuable materials going unused into landfill or for incineration. The adoption of standards and definitions could remedy some of these issues.

The EU could influence the creation of international standards and regulations through international multilateral agreements. In the light of the recent amendments to the Basel Convention,[36] the adoption of internationally binding rules on waste standards and definitions seems to be gaining momentum. This success is a good signal and an excellent starting point for discussing a more comprehensive global policy framework that covers the whole life cycle of plastics, making sure that in the coming decades a circular economy approach to the plastics value chain is implemented around the world. A majority of UN member states from across the globe have already officially declared that they support the development of a new legally binding global instrument. This will hopefully lead to a decision on the establishment of an intergovernmental negotiating committee at UNEA-5.2 in February 2022.[37]

35 Ibid.

36 In spring 2019 the UN Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, i.e. the Basel Convention, introduced a ban relating to the trade of plastic waste.

37 Oceans Day Plastic Pollution Declaration (http://plasticdeclaration.aosis.org/).

The circular economy of plastics: a vector for competitiveness and environmental improvement

By Benoît Calatayud

Despite having already reached an annual total of 400 million tonnes worldwide, annual plastics production is expected to double by 2050. However, the environmental damage caused by the use of plastics is considerable: for example, more than 12 million tonnes of plastics end up in the oceans every year. The impact of plastics is not only ecological, it is also economic: according to the Ellen MacArthur Foundation, 95% of the value of plastic packaging materials is lost to the economy in the space of a very short cycle that ends immediately after the first use of the plastic. This adds up to nearly €100 billion of waste each year.

To reduce the dual environmental and economic impact of plastics, we must act on the entire value chain: production, use, recycling and reuse.

To do this – and while the recovery plans that are being implemented in the European Union represent rare opportunities to invest in systemic economic changes – it is necessary to dismantle the traditional linear economy model. The 'produce, consume, throw away' triptych must give way to a development model based on the circular economy: creating production and consumption loops that are vectors of local economic development. The value lost in the linear economic cycle would thus be gained by companies, which must now be encouraged to adopt better ways of using and recovering plastics.

How can this be achieved?

This chapter takes stock of plastic pollution and its damage; reminds us that the objective is not to make plastics disappear but to produce and consume them better; points out the limits of current

policies in this area; and, finally, proposes actions to be taken to achieve a circular development model.

PLASTICS CAUSE HEAVY POLLUTION AND COLOSSAL ECONOMIC LOSSES, BUT THEY DO ALSO OFFER HEALTH AND ECONOMIC ADVANTAGES

Plastics are very diverse. A plastic is a material made up of one or more polymers to which fillers (for reducing costs or improving properties), plasticizers and additives (colourants, antioxidants, etc.) have been added. For plastics of the same chemical nature, there are hundreds – even thousands – of different formulations.

The synthetic polymers used to manufacture plastics are generally classified into two categories: thermoplastics, which, under the effect of heat, become malleable again (they represent 80% of plastics consumption); and thermosets, which cannot be melted down for reuse and are therefore not recyclable. Polymers can also be classified according to the origin of the carbon atoms that they are composed of: hydrocarbons for fossil polymers (99% of all plastics) and biomass for biosourced polymers. Some polymers are biodegradable, which means that they can be used as a source of carbon by microorganisms under specific conditions. Polymers that are both biosourced and biodegradable are referred to as biopolymers.

All plastics are lightweight, stable, insulating, impact resistant and corrosion resistant. Plastics are extremely versatile materials; the variety of their shapes and colours and their flexibility or rigidity properties make them suitable for a wide range of functions. The relatively low density of most plastics makes them light, which facilitates their handling and reduces fuel consumption during transportation. This lightness is not in conflict with good toughness and strength properties, either. A plastic bag containing no more than three grams of polymer, for example, can carry up to three kilograms – or 1,000 times its weight.

Plastics also have thermal and electrical insulation properties, and their corrosion resistance makes them useful in hostile environments. Because of their impermeability properties, plastics are

widely used in the field of food packaging: it is the only material that allows the food it contains to be preserved in a modified atmosphere.

The production and use of plastics around the world is growing, particularly in Europe. World production has grown exponentially: from 2.3 million tonnes in 1950, to 162 million tonnes in 1993, to 448 million tonnes in 2015 – with the majority of use in packaging. Given their wide range of properties, plastics are used in almost all areas of our economy, and particularly in automobiles, construction, kitchen utensils, hygiene and clothing.

The lifespan of their use, initially intended to be long term, is tending to shorten, especially following the widespread emergence of single-use plastics, of which the food packaging sector is an emblematic example. Foodstuffs such as beverages, pasta and rice, dairy products, cereals, ready meals, meat and fish are very often packaged in single-use plastics.

Plastic packaging also affects other sectors of our economy. Cosmetics and hygiene use a lot of packaging based on the production of single-use plastics (bottles, jars, soaps, individual pods, etc.), and medical devices also use a lot of single-use plastics (bandages, gloves, masks, etc.).

While awareness of the need to limit the production and use of plastics has been growing for about the last fifteen years, the Covid-19 health crisis has marked a resurgence in their use. Masks and gloves, waterproof gowns, goggles, visors and face shields are all largely made of plastic.

The vast majority of plastics today are for short-term use. Though there are variations depending on the volumes and lifetimes associated with different uses, overall 81% of plastics put into circulation become waste after one year.

The use of these plastics generates significant pollution for the environment – and particularly for the oceans – as well as colossal economic losses. Plastic pollutes in various forms: macro, micro and nano. A macroplastic is any piece of plastic that is larger than five millimetres. The width of a microplastic (e.g. those found inside tires, clothes, etc.) is between five millimetres and one micrometre. Nanoplastics correspond to fragments whose size is smaller than one micrometre.

The damage to living organisms and biodiversity is considerable. According to the European Commission, about 1.4 million birds and almost 14,000 mammals are found dead each year due to the ingestion of macroplastics. The chemical risk linked to plastic pollution – particularly microplastics and nanoplastics – nevertheless appears preponderant.

Plastic waste can contaminate environments and organisms through endocrine disruptors or persistent organic pollutants. This contamination occurs with chemical substances contained in plastics – particularly plasticizers and additives – which are likely to be diffused into the environment in cases of the non-collection of waste.

Depending on the species, microplastics (and the chemical contaminants that compose them) can affect physiology, metabolism, behaviour and reproduction. The impacts of plastics, particularly on humans, are still poorly understood, but they are potentially devastating.

Plastics also have important economic impacts in sectors such as fishing (reduced fish catch), tourism (degradation of tourist sites), maritime transport (damage) and port infrastructures (cleaning). The United Nations Environment Programme estimates that the annual worldwide cost of the damage to the marine environment is $8 billion.

THE OBJECTIVE IS NOT TO MAKE PLASTICS DISAPPEAR BUT TO PRODUCE AND CONSUME THEM BETTER

Given their essential properties in the food and sanitary fields and the absence of any equivalent alternatives being developed to date, it is not desirable for plastics to disappear completely; the goal is rather to develop ecodesign, i.e. to integrate environmental aspects into the design and development of products in a life-cycle approach, and to reduce the use of single-use plastics.

One of the challenges is to reduce the use of plastics where they are not needed, especially in packaging. According to a report by the European Court of Auditors, the production of plastic packaging waste continues to grow and is now close to 18 million tonnes

per year. Packaging now accounts for just over 60% of total plastic waste production in Europe. However, because a recent amendment has meant that the Basel Convention no longer allows the export of uncontaminated plastic waste – and given the desire of Asia, particularly China, to receive less plastic – Europe is obliged to recycle more plastic within its own borders. This is a real challenge, as collection and recycling channels are relatively undeveloped in Europe. According to the European Court of Auditors, the plastic recycling rate is between 30% and 40% at the European level, whereas the objectives set by the European Commission are 50% by 2025 and 100% by 2030 (see the next section). For the time being, Europe remains dependent on non-European countries to recycle its waste.

In addition to this recycling objective, reducing the use of single-use plastics must be a priority, in favour of developing reusable and recyclable plastics.

Achieving these goals has a number of benefits for companies. Firstly, the recycling of plastic waste could become profitable. By allowing for more collection – and, especially, a higher recycling rate than today – a standardized system for the selective collection and sorting of waste across the European Union would save about €100 per tonne collected, according to the European Commission, and would bring greater added value to a more competitive and resilient plastics industry.

In addition, when companies adopt ecodesign and flow-reduction approaches into their production of goods, they gain competitiveness. Targeted support schemes such as Diag Eco-Flux (offered by Bpfirance, the French public investment bank) help small and medium-sized companies to adopt approaches that reduce waste flows, particularly for plastics. In addition, this type of scheme makes small companies aware of their room for manoeuvre in terms of energy and raw-material savings in their processes, particularly with regard to plastics. By generating savings in these items, there are gains in competitiveness with little investment. The company can then consider modifying its production process to produce ecodesigned products and thus retain or increase their market share.

CURRENT POLICIES ARE TOO LIMITED AT THE INTERNATIONAL, EUROPEAN AND NATIONAL LEVELS

The policies that are in place today are not proving to be effective in combating the strong trend of increasing plastic production and use.

Conventions

Conventions exist at the international level to limit the discharge of plastics into the oceans, such as the London Convention on the Prevention of Marine Pollution by Dumping of Plastic Wastes (adopted in 1972), the Marpol Convention for the Prevention of Marine Pollution from Ships (1973), and the 1982 United Nations Convention on the Law of the Sea. However, these conventions are not binding. This limits their scope considerably.

The European framework

The European Union has long been dealing with the subject of plastic waste. However, faced with the growing threat of uncontrolled plastics production and consumption, in 2018 the European Commission defined a strategy on plastics to reconcile environmental protection and economic growth, as some plastics remain an irreplaceable material for many purposes, as mentioned above. This strategy aims to treat plastics in a holistic way, and includes the prohibition of certain uses (see the next paragraph); to make improvements to the collecting, sorting and recycling of plastics (the European Commission's goal is to achieve a 100% recycling rate for all plastic packaging by 2030); to support the incorporation of recycled plastics; to expand obligations for producers; and to better manage ship-generated waste.

The European Union is moving in the right direction in the fight against plastic pollution, but the effectiveness of the measures is limited by the power of lobbies. For instance, the EU directive on the reduction of the impact of certain plastic products on the environment (adopted in 2019 and entering into force in 2021), prohibits the sale of more than a dozen products that are defined as single-use,

such as cutlery, plates, straws, swizzle sticks and cotton swabs. The directive targets products that end up on beaches and oceans, which are the largest source of uncollected waste. In addition to reducing the use of products containing plastic, its provisions aim to extend the 'polluter pays' principle to certain producers of those products, such as those in the fast food and tobacco industries. Companies in the tobacco industry will also have to pay for the collection of discarded cigarette butts in the street.

However, this directive has been significantly influenced by lobbies. Recently, during the first wave of the Covid-19 pandemic, the European Plastic Converters (EuPC) trade association approached the European Commission to request a one-year postponement of the ban on single-use plastics set out by the directive.

In addition, the regulation related to the ban on endocrine disruptors is having difficulty being implemented. The CLP1 regulation imposes specific labelling for a certain number of CMR substances (carcinogenic, mutagenic and toxic for reproduction), some of which are potential endocrine disruptors, but it excludes certain products (food, food supplements, medical devices, medicines, cosmetics) that are covered by specific sectoral regulations.

In addition, the 2019 directive on the impact of plastic products is too restrictive with regards to biodegradable plastics, which continue to be considered as traditional plastics even though they can have a positive effect on the environment. Indeed, in cases of non-collection, a biodegradable plastic is much more benign than a traditional plastic.

Microplastics and nanoplastics are not specifically banned at the European level, although there is an urgent need to act.

Finally, the monitoring and enforcement of the provisions of the directive are difficult to achieve.

ACTIONS TO IMPLEMENT FOR A TRUE CIRCULAR ECONOMY OF PLASTICS ARE LOCATED AT ALL LEVELS OF GOVERNANCE

Following the example of what NGOs such as the WWF and Greenpeace are proposing, a legally binding international treaty on plastic waste and microplastics should be put in place – along the lines of

the Paris Agreement signed on 12 December 2015. This treaty would address the topic of plastics in a holistic manner, with a binding, and therefore effective, approach.

In addition, a European or global scientific platform on plastic pollution could be created, at the initiative of the European Union, in order to allow shared access to standardized data, similar to the one set up in the climate field by the IPCC or the one set up in Europe through the Circular Plastics Alliance, which aims to promote, in particular, the recycling of plastics, in a circular economy approach.

Ecodesign must be developed, at least at the European level, in order to target products containing plastic throughout their life cycle, from production to use.

In addition, sorting instructions must be generalized in order to encourage the reuse and recycling – and eventually even the composting – of plastic waste.

Innovation in recycling must be supported through the European Investment Bank, and European innovation programmes should encourage the acceleration of new recycling technologies, including chemical recycling that could complement mechanical recycling and the development of microplastic filters, especially for washing machines.

Finally, the production of biodegradable plastics must be clearly encouraged, in particular through the exclusion of this type of plastic from the categories targeted by the 2019 directive on single-use plastics.

In conclusion, given the ever-increasing production of plastics and the damage that could result, it is urgent that action be taken, at all levels of governance, to limit the health and socio-economic impacts of plastics. The coordination and control of measures must be put in place at the global level. The European Union seems to be moving in the right direction, but the rest of the world must follow its measures. States and local authorities have a role to play in adapting global measures to their local specificities. However, any public action requires the support of citizens. Measures aimed at reducing the use and production of plastics must therefore be carried out in a democratic way and avoid excessively penalizing the poorest populations, e.g. by excessively penalizing their acts of consumption without proposing an accessible alternative.

Conclusion

By Andreas Dimmelmeier

Transitioning towards a circular economy is a multifaceted, multi-level process. As the contributions to this volume have made clear, changes need to be made by many actors, situated across various systems, sectors, political institutions and geographies. This concluding chapter summarizes the book's contributions by focusing on policy recommendations that the authors derive from their analyses. Taking stock of the suggested policies offers policymakers an outlook on which reforms could be adopted at different governance levels. It is, however, also of interest to academics as the policy recommendations reveal the definitions and dimensions of the circular economy, thus making the concept easier to grasp.

Reviewing the recommendations that have been outlined, it becomes apparent that a transition towards a circular economy covers broad structural transformations such as changes to societal values and the emergence and scaling up of new business models. At the same time, more tangible policy interventions have been reviewed as means to set societies and economies along the path to such profound changes. These measures include public investment, sustainability labels, regulations and provisions in trade agreements.

To categorize rather than merely restate the authors' recommendations, this conclusion sorts the suggested policy measures according to two questions. The first question relates to *who should take action* with regards to the transition towards the circular economy. The second question, by contrast, asks *what should be done*, thereby sorting the recommendations according to the type of policy instrument that is advocated.

With regards to the first question, the contributions can be sorted into six categories. First, societies as a whole – and the individuals

that make them up – can act by changing their mindsets and behaviour. Second, businesses can be change agents in their own right as they develop new products and change their business models. The remaining four actors are political entities at various geographical levels, ranging from the local, to the national, to the European and the global.

Who should take action with regards to the circular economy? (Chapters that mention the actor in their recommendations.)

- Individuals and society (the chapters by Brambilla; Loikkanen *et al.*; Totaro)
- Businesses (Totaro; Bachus; Gore)
- Local government (Brambilla; Totaro)
- National governments (Totaro; Bachus)
- The EU (Loikkanen *et al.*;, Turunen; Totaro; Bachus; Gore; Kuch & Wachholz; Calatayud)
- Global institutions (Kuch & Wachholz; Calatayud)

Applying the six actor types that are derived from the first question to the policy recommendations of the contributions, it can be seen that the chapters by Brambilla, Loikkanen *et al.* and Totaro emphasize actors from the societal level, as these chapters raise more broad cultural questions. The recommendation in the chapter by Loikkanen *et al.* to redefine what constitutes 'waste' is a case in point. In general the contributions from the three above-mentioned chapters problematize consumption patterns and the priorities of politics and economics. While it is harder to pin down concrete measures that contribute to these aims, the contributions point to awareness-raising as well as to discursive and cultural factors.

As regards the agency of business, the chapters by Totaro, Bachus and Gore in particular discuss circular economy business models that favour longevity and closed supply chains, such as product-as-service set-ups, sharing platforms and recycling schemes. These actions by businesses are illustrated through case studies in sectors including clothing, household appliances and automobiles.

In terms of recommendations, the chapters by Totaro, Bachus and Gore also elaborate on the actions of political actors across various geographies, thus stressing the strong links between business practices and the political and regulatory environment. When looking at the preferred political actor across all the contributions, a clear focus on the European level becomes evident, as interventions by the EU are stressed in all contributions with the exception of the chapter by Brambilla, which addresses more definitional issues. Some chapters notably combine this with national and local initiatives, reflecting that in many matters responsibilities are shared between different levels of governance. This understanding speaks also to the relevance of multi-level governance[1] for circular economy matters.

Interestingly, some of the chapters also explicitly advocate for the EU to link its policies to international regulations and standards. This could be interpreted in light of the recent literature on the regulatory power of Europe, or the so-called Brussels effect.[2] This concept posits that Europe can, by means of its advanced regulatory apparatus and its power as a major market, export its norms and convert them into international standards. Policy issues such as digital privacy codes, i.e. the global reach of the GDPR Regulation, are often cited as examples. The contributions to this volume raise the interesting question of whether similar dynamics could also apply to issues related to the circular economy.

Going from the more abstract dimension of scale and governance levels to the types of measures themselves, the second question – of what should be done – leads to the identification of eight categories.

1 For a literature review, see Piattoni, S. 2009. Multi-level governance: a historical and conceptual analysis. *European Integration* 31(2), 163–180.

2 Bradford, A. 2015. Exporting standards: the externalization of the EU's regulatory power via markets. *International Review of Law and Economics* 42, 158–173 (https://doi.org/10.1016/j.irle.2014.09.004). Bradford, A. 2020. *The Brussels Effect: How the European Union Rules the World*. Oxford University Press.

Which measures should be adopted to transition towards a circular economy? (Chapters that mention the measure in their recommendations.)

- Changes in mindset and values (the chapters by Brambilla; Loikkanen *et al.*; Totaro)
- Investment and subsidies (Brambilla; Totaro; Bachus; Gore; Calatayud)
- Training and skills (Brambilla; Totaro)
- Labels and standards (Bachus; Gore; Kuch & Wachholz)
- Laws and regulations (Turunen; Bachus; Gore; Calatayud)
- Taxation (Loikkanen *et al.;* Totaro; Bachus)
- Trade rules (Kuch & Wachholz)
- New institutions (Calatayud)

The types of policy instruments favoured by most contributions (five chapters) are investments and subsidies. This is followed by laws and regulations (four chapters), with implementation being favoured at the European level. Changes in mindset, reforms to taxation and changes in labels and standards are each addressed by three contributions. Finally, training and skills development, amendments to trade policy, and the setting up of new institutions are less commonly suggested measures.

When interpreting the focus of the chapters' recommendations, one should caution against taking the above enumeration as a definitive sign of the importance of each type of measure for the circular economy overall. As the book's chapters take multiple perspectives and case studies into account, a simple tally is necessarily beset with shortcomings. With this caveat in mind, one can nonetheless derive some hypotheses regarding the role and interplay of the different types of measure.

One finding that becomes apparent from the contributions is that public investment is needed at multiple levels to build the infrastructure necessary for a circular economy. Examples for such investment needs include the creation of municipal recycling infrastructure and local supply chains (see the chapter by Brambilla) as well as the funding of tool libraries and affordable rental services for

high-quality durable products (see the chapter by Totaro). Moreover, existing institutions that make a positive contribution to the circular economy as well as to local employment and well-being, such as businesses in the social economy, will require further investment if circular economy models are to grow in scale (see the chapters by Gore and Bachus). Certain sectors such as buildings, mobility, food waste (see the chapter by Gore) and plastics (see the chapter by Calatayud) have been identified as priority targets for such investments.

The focus on enhanced investment connects to calls for scaling up the ambition of Next Generation EU – the EU's recovery programme that has been set up as a response to the Covid-19 pandemic – and the public spending more generally that is being targeted at delivering a climate-neutral, sustainable economy. While the huge investment that is needed to address the climate crisis and transition towards a circular economy is interpreted by some as a violation of economic prudence from a short-term perspective, recent studies have emphasized that the cost of inaction exceeds the cost of transition. This is because the physical consequences of unmitigated climate change will result in significant costs for firms as well as the financial sector, and consequently for the economy as a whole.[3] At the same time, research has stressed the benefits of adopting large public investment initiatives to update the structure of our economies.[4]

Several chapters advocate for binding targets that enshrine resource use and waste reduction targets in legal instruments. The Turunen chapter in particular covers the legal aspects of EU regulation and recommends an overhaul of the EU legal framework towards a more holistic coverage that takes the entire life cycle of products into account and also sets minimum targets for circular economy measures in member states. This avenue of governing via targets and product design requirements is already employed at the EU level via the Sustainable Products Initiative that was launched in

3 See, for example, European Central Bank. 2021. ECB economy-wide climate stress test: methodology and results. Publications Office, European Central Bank (https://data.europa.eu/doi/10.2866/460490).

4 See, for example, Wildauer, R., Leitch, S., and Kapeller, J. 2020. How to boost the European Green Deal's scale and ambition. FEPS Policy Paper.

December 2021. Future research and policymaking could therefore benefit from an assessment that compares the demands for holistic legal treatment of products aligned with the circular economy with the reality of the implementation of the initiative.

The chapter by Gore also highlights the use of minimum targets as a policy instrument. However, his contribution stresses a different angle, insofar as it is not only concerned with minimum targets for circular economy measures but also with minimum targets for including social economy actors in the circular economy value chain. Finally, Calatayud's chapter demonstrates the need for sectoral and material-specific regulation by discussing the issues of plastics at both the EU level and the global level.

Recommendations related to tax reforms emphasize the necessary changes in the incentive structure to drive economic actors away from unsustainable business models. Moreover, recommendations on tax shifts highlight the need to be attentive to distributional outcomes, thereby ensuring that reforms deliver socially progressive outcomes. The chapter by Bachus illustrates this by discussing the need to shift tax revenues away from labour to materials use, i.e. ecological tax reform. Accordingly, high rates of materials use, which contribute to environmental degradation and are an outcome of the linear economy, are disincentivized. At the same time, taxation on labour would be reduced, hence ensuring that workers' incomes increase.

Another recommendation that is mentioned in more than one chapter is to make further strides in ensuring that information becomes more accessible and standardized. This is the case for labels that can aid consumers in making informed choices (see, for example, the suggestion of a "recycled in the EU" label in the chapter by Gore). However, labels and standards can also provide the basis for regulatory interventions and trade policies (see the chapter by Kuch & Wachholz). The recommendations on improved information and labelling also shed light on the bigger question of the necessity of a data infrastructure that enables the assessment – and ultimately the governance – of the circular economy. Recommendations going in the same direction can also be found in a recent report by the European Environment Agency that stressed the importance of scaling

up the monitoring of materials stocks and flows through methods such as life cycle assessments and product footprints.[5]

As well as gathering data, it is also crucial to ensure that the collected information is used and understood by businesses and regulators. In this context, the inclusion of the circular economy as one of the categories of the sustainable finance taxonomy at the EU level could probably be an interesting entry point, since the taxonomy is already shaping reporting from financial institutions (and thus indirectly from the businesses in the real economy that they finance) as well as regulatory assessments. As the recent history of the taxonomy demonstrates, however, seemingly technical processes like the search for data and definitions can become politicized and influenced by special interests. Hence, advocates for a circular-economy-focused data infrastructure need to build political support across the EU.

Finally, the recommendations to improve skills and training for future circular economy workers (see the chapters by Brambilla and Totaro), to amend the structure of trade agreements towards including circular economy considerations (see the chapter by Kuch & Wachholz), and to create new institutions to deal with issues related to plastics (see the chapter by Calatayud) are more targeted towards the specific focus of the respective chapters.

From the broad range of recommendations as well as from the grouping of the suggestions in terms of the categories from the two lists, policymakers and academics can draw several conclusions. On the policy side, the contributions indicate that there is no single silver bullet measure that will set us on the path towards a circular economy. Instead, investment has to go in tandem with tax reform and regulations. Crucially, the social impacts of such measures have to be accounted for in the design phase in order to ensure that the benefits of a transition are distributed fairly, that good work conditions exist in circular economy sectors and that high-quality products and services are accessible for everybody.

5 European Environment Agency. 2021. Knowledge for action empowering the transition to a sustainable Europe. EEA Report No. 10/2021, European Environment Agency, p. 34.

While these recommendations cover the majority of the contributions, the more specialized suggestions on issues such as international trade, skills development and plastics governance emphasize that a transformation towards a circular economy needs to engage deeply with the nitty-gritty technical aspects of individual policy fields and sectors.

From an academic perspective, the grouping of the recommendations with regards to the types of measure can be analysed by applying Jacobs's typology of environmental policies and their underlying economic assumptions.[6] First, Jacobs differentiates between traditional law and regulation approaches and approaches that focus on incentive shifts through means such as taxes or tradable quotas. The traditional approach rests on the functioning of the political process, where scientific evidence on environmental hazards enters the public debate and legal actions ultimately reflect the priorities of the actors in the political system. Incentives-based approaches, by contrast, are grounded in neoclassical economic thinking, which seeks to integrate negative external effects through pricing. In addition to the approaches described above, Jacobs outlines the ideas of the property rights school, which, following Coase, sees the privatization of the commons as the solution to environmental degradation.[7] His final and preferred approach is the 'environmental democracy' model. This approach is agnostic in terms of choice of policy instrument – which can be laws, public investments or taxes[8] – and stresses that public authorities should implement reforms that are based on participatory debates.

Reviewing the recommendations made by the contributions in this volume in light of Jacobs's typology suggests that the authors lean towards either traditional law and regulations approaches or a multi-measure environmental democracy model. Support for emphasizing the participatory aspect can also be found in the contributions

6 Jacobs, M. 1995. Sustainability and 'the market': a typology of environmental economics. In *Markets, the State and the Environment,* pp. 46–70. London: Palgrave. For the typology mentioned here, see pp. 49ff.

7 Coase, R. 1960. The problem of social cost. *Journal of Law and Economics* 3, 1–44.

8 Jacobs (1995). Sustainability and 'the market', p. 50.

that emphasize changes in mindset. While tax and incentive shifts are seen as valuable instruments for achieving the transition towards a circular economy, the contributions refrain from singling out a solution as an 'optimal' or silver bullet strategy.

This finding connects the academic implications of the volume with those related to policymaking. In both cases it can be concluded that the transition towards a circular economy will involve a variety of actors, sectors, policy fields, governance levels and measures. Hence, apart from querying the effectiveness of a measure at its level of implementation, policymakers must also be aware of a policy's interactions with other measures and its implications for adjacent policy fields. To give more concrete examples, laws and regulations at the EU level have to be looked at in conjunction with international standards and trade policies (see the chapters by Kuch & Wachholz and Calatayud). Moreover, public investments and taxation shifts have to support such laws rather than counteract them. In this context, the social implications are also crucial, as it is necessary to ensure that the combined effect of such measures is progressive rather than regressive and that it privileges actors of the social economy rather than exploitative business practices (see the chapters by Bachus and Gore).

While the contributions already capture many of these interactions, both policymaking and future research could benefit from a deeper exploration of the empirical connections between them as well as from an explicit theoretical (or policy) framework that sets them into perspective. This should not prevent policymakers from taking action today, however, as the need for transitioning to a circular economy is urgent and the costs of inaction are immense. This volume's collected contributions offer a resource that can accompany policymakers, businesses and individuals during this process.

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About the authors

Kris Bachus is a research manager of climate and sustainability at the HIVA Research Institute of the University of Leuven. He holds a PhD in social science and a master's degree in economics. Since 1998, he has conducted and coordinated many research projects, most of which are policy oriented, commissioned by EU, Belgian federal or Flemish government agencies. The circular economy is the central topic of Kris's research. He is the coordinator of the Michelle project on the impact of the circular economy on employment in Flanders. He is promoter of the research line 'employment and circular economy' of the Flemish Policy Research Centre for Circular Economy, and coordinator of the H2020 project Pop-Machina. Kris also has expertise in environmental taxation, sustainability transitions, climate finance, environmental policy evaluation and climate policy.

Ilaria Nicoletta Brambilla, a cultural and cognitive geographer by training, works as a freelance writer, researcher and environmental communication consultant. She is a designer and manager of international projects on sustainability, cultural and social enhancement. She co-authored the book *What Is the Circular Economy* (Edizioni Ambiente, 2018/2021)

Janis Brizga is the head of the board at the NGO Green Liberty and a researcher at the University of Latvia, Department of Geography and Earth Sciences. Previously, he was a chair of the NGO network ANPED – the Northern Alliance for Sustainability; the Environmental Policy Programme Director at WWF-Latvia; and the Executive Director

at Coalition Clean Baltic's Latvia office. He has received a PhD in geography (environmental science) and a Master's in social science in public administration at the University of Latvia. He is working on issues of sustainable development, sustainable consumption governance and environmentally friendly behaviour.

Benoît Calatayud has worked at the Commission de régulation de l'énergie and at Bpifrance. After having contributed his expertise in the energy and climate sector to the Jean-Jaurès Foundation's Energy and Sustainable Development group of experts, he is now the coordinator of the Observatory of the Energy and Social Transition.

Saïd El Khadraoui is Special Adviser to FEPS on the European Green Deal. He is a former Member of the European Parliament and former sustainability adviser at the European Political Strategy Centre, the European Commission's in-house think tank. He has acquired extensive knowledge and policy experience in a large number of areas that are now at the very core of the European Green Deal such as transport and mobility, and its links with other systems such as energy and food, as well as the circular economy, sustainable finance and sustainable development more generally. As a former deputy mayor of and city councillor of Leuven, Belgium, he has also gained substantial expertise at the local level. He holds a degree from KU Leuven in contemporary history and international relations, and in 2018 obtained an Executive MBA degree at the Vlerick Business School. He is a Certified Expert in Sustainable Finance (Frankfurt School of Finance and Management, January 2021) and received certificates on Design Thinking and Creativity for Business (Insead, September 2020). He is currently also a Fellow at the KU Leuven Public Governance Institute. Since January 2019, he is the Chairman of the Board of the STUK art centre, House for Dance, Image and Sound, in Leuven.

Andreas Dimmelmeier works as a Policy Analyst on Climate and Environment at FEPS. He holds a PhD in political science and political economy from Copenhagen Business School and the University of Warwick. His doctoral research focused on the expert networks in the emergence of sustainable finance; the role that economic ideas played in this process; and how socio-technical tools such as standards, metrics and scenarios have made sustainable finance governable. Andreas has published on the interactions between finance and financial regulation and on the transition towards a sustainable economy in international peer-reviewed academic journals and edited volumes. In addition, he has contributed to policy reports and policy briefs on these topics.

Tim Gore is head of the low carbon and circular economy programme at the Institute for European Environmental Policy, and he was formerly the head of policy for climate, food and land at Oxfam International. His work focuses on the intersection between ecological limits and inequality, human rights and social justice.

Heikki Huilaja is a senior lecturer of sociology in the Faculty of Social Sciences at the University of Lapland. Since 2003 he has worked in several teaching and research positions at the University of Lapland. Huilaja's main research interest is the sociology of work. In his doctoral dissertation he studied recruitment as a context in which qualifications and suitability for work are situationally negotiated. He has published on issues such as work and working life; skills and qualifications; the recruitment process and the negotiated context of recruitment; and skills in service work. In waste studies, Huilaja's interest is in waste as work and business and on the societal organization of waste in Finnish Lapland.

Veera Kinnunen (DSocSc, University of Lapland; Bachelor of Design, Kuopio Academy of Design) is a sociologist and a cultural historian working on the threshold of more-than-human sociology, environmental humanities and feminist ethics. Veera holds a position as a senior lecturer of sociology at the University of Lapland. She is also working as a postdoctoral researcher in the Society of Waste research project, funded by the Academy of Finland (2018–21). Veera's research interests cover the material culture of everyday life, dwelling and waste. Her ongoing research project is an ethnographic inquiry into experimental waste practices. Throughout her research projects, she has been developing and experimenting with the more-than-human ethnographic methodology.

Amelia Kuch leads the policy research unit of the Ellen MacArthur Foundation, developing and communicating policy insights to national and city governments and other key ecosystem players, including businesses and policy organizations. Prior to joining the foundation, Amelia worked as a consultant in Europe and Africa, covering various policy topics including migration policy, land reform, sustainability, agriculture policy and rural development. In her work, Amelia champions the philosophy that mission-driven policy can accelerate the transition to the circular economy and deliver on broader social and environmental policy objectives globally. Amelia has a PhD in international development from the University of Edinburgh and is an alumna of the University of Oxford.

Teemu Loikkanen is a PhD student of sociology and a junior researcher of the Waste Society project at the University of Lapland, Faculty of Social Sciences. In his Master's thesis, he studied the construction of waste citizenship in waste governance. In his current postgraduate research

he examines the moulding of waste management infrastructure, required by the EU's circular economy policies. Teemu's research is focused on the citizen's position in the circular economy at the moment.

Antonella Ilaria Totaro is a researcher in Innovation for the Circular Economy at the University of Turin. She writes for the publisher Edizioni Ambiente and for the magazine *Renewable Matter*, for which she also writes the 'Startup' column. She is responsible for the production and communication of the 'Investing in regenerative agriculture and food' podcast. She is interested in innovation, start-ups and new business models, mobility and sustainable food systems. She shares her time between Italy and the Netherlands.

Topi Turunen (LLD) is an environmental law researcher at the University of Eastern Finland Law School and the Finnish Environment Institute (SYKE). His research mostly focuses on the regulation of the circular economy. Currently he is a work package leader in the CICAT2025 project (Circular Economy Catalysts: From Innovation to Business Ecosystems) funded by the Strategic Research Council at the Academy of Finland (grant number: 20194/320206).

Jarno Valkonen is a professor of sociology in the Faculty of Social Sciences at the University of Lapland, as well as an adjunct professor (docent) of environmental sociology at the University of Eastern Finland and an adjunct professor (docent) of nature and natural resource politics at Tampere University in Finland. His research interests are wide ranging and include the politics of nature, nature-based economies, tourism work, human–nature relationships, indigenous knowledge, ethnopolitics and environmental conflicts. Currently, he leads the Waste Society

project, studying ontological politics of waste in Finnish Lapland. He is interested in how infrastructures (energy, water, waste) interact with social structures to shape human conceptions of nature, human–nature relationships and human action.

Carsten Wachholz supports the development of circular economy policies at the EU and international levels, as part of the Institutions, Governments and Cities team of the Ellen MacArthur Foundation in close collaboration with the foundation's systemic initiatives on plastics, fashion, food and finance. Before joining the foundation, Carsten worked for the European Investment Bank on corporate responsibility, engaging with civil society organizations and other stakeholders on the EIB's role in tackling climate and environmental challenges. Prior to that, he worked for both European and German NGOs as well as for different management consultancies. His expertise covers a broad range of policy areas, including climate change, energy policy, natural capital, the circular economy, urban development, demographic change and sustainable finance. Carsten studied environmental science at the University of Lueneburg in Germany and participated in an international executive programme on sustainable business organized by the University of St Gallen and Business School Lausanne in Switzerland.

The Circular Economy and Green Jobs in the EU and Beyond

Edited by Janis Brizga and Saïd El Khadraoui and with a foreword by Frans Timmermans, Vice-President of the European Commission

The circular economy is a model of production and consumption that is underpinned by a transition to renewable energy and materials. It is a resilient system that is good for business, people and the environment.

The Circular Economy and Green Jobs in the EU and Beyond examines what the circular economy means, why the transition from a linear economy to a circular one is important, and how we can achieve it. The book offers clarification on the meaning and the implications of the circular economy across different contexts – economic, social, cultural, legal and international. In doing so, it goes beyond simply arguing in favour of a circular economy and critically assesses the political and distributional choices that are made during this transition. Particular emphasis is placed on the implications for jobs and different business models as well as on questions of equity.

Janis Brizga is the head of the board at the NGO Green Liberty and a researcher at the University of Latvia, Department of Geography and Earth Sciences. He has more than 25 years of experience working with sustainable development and ecological economics both on a national level as well as with the EU and UN processes.

Saïd El Khadraoui is Special Adviser to the Foundation of European Progressive Studies (FEPS) on the European Green Deal. He is a former Member of the European Parliament and former sustainability adviser at the European Political Strategy Centre, the European Commission's in-house think tank. He is currently also a Fellow at the KULeuven Public Governance Institute.

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