Natural resources have fuelled the great economic growth stories of the last century (UNEP 2016). This growth, in turn, has improved living standards around the world and enabled many of the most successful industries. But this model has reached its limits. To further increase prosperity in Europe and beyond, we need to create a new kind of economy according to the principles of a ‘decoupling’ paradigm that delinks development from resource use and impacts. One of the most powerful instruments in moving towards decoupling prosperity from material resource dependence is the circular economy.

And the rationale is there: the transition to a circular economy carries enormous, underdeveloped, possibilities. It can significantly reduce environmental and health impacts while boosting economic development in industrialized and developing countries. Estimates by the International Resource Panel show that concerted resource management and efficiency measures can boost economic growth by 8 per cent globally by 2060 over a business-as-usual scenario. The potential is much larger if we fully embrace the decoupling transition by employing it as the general innovation principle across sectors and ministries.

The transition is really without an alternative. Continuing with the historical model of consumption and production we currently live in would far overshoot the planet’s capability to host humanity.

The Global Resource Outlook 2019, published by the UN International Resource Panel, reveals that the extraction and processing of natural resources causes 90 per cent of global land use-related biodiversity loss and water stress, and more than 50 per cent of global climate change impacts. About 20 per cent of greenhouse gas (GHG) emissions are caused by the extraction and processing of metals and non-metallic minerals alone. This trend became particularly pronounced as, somewhat counterintuitively, global average resource productivity started to decline around 2000 and has stagnated in recent years due to a structural production shift from more to less resource-efficient countries. At the same time, high-income countries are becoming more and more dependent on resource imports: in 2017 the average person in high-income countries used 9.8 tons of primary materials mostly produced and processed elsewhere in the world. This reliance has been increasing at a rate of 1.6 per cent per year since 2000 (IRP 2019).

Shifting production and consumption into a circular model is still an underrated instrument for managing the most urgent challenges of humanity. This is apparent when one examines the challenge to limit global heating to well under 2°C (Paris Agreement) with intent to not surpass 1.5°C. Material production – specifically of steel, non-ferrous metals, chemicals, non-metallic minerals – plays a central role in this challenge. These processes are particularly energy- and emissions-intensive and tricky to decarbonize through pure production and energy focused solutions. Decarbonizing material production would become an even bigger challenge in the future, as without urgent action the world is expected to consume up to 190 billion tonnes of materials (including biomass) by 2060. In
addition to work to decarbonize production, we need to urgently become smarter about circular consumption.

Reducing our dependence on material production is the most direct and potentially cost-efficient lever to decarbonize our economies, while creating co-benefits such as reducing air pollution by industry or reducing negative ecosystem impacts by increased mining. We can achieve this through more efficient, shared use of products and services, strategic extension of their lifetime and improvement of their energy efficiency, and closing material loops – the key elements of the circular economy.

While appreciating the already growing circular economy momentum among businesses, policy makers and civil society, planning and implementation must become more ambitious and more strategically linked to goals beyond waste management, in particular mitigating climate change and biodiversity protection.

In today's context of globalized value chains and interdependent markets, making the circular economy work will require business innovations as much as better global cooperation and adequate institutions. While a global circular economy must benefit in particular developing countries, the technologically advanced and high-consuming countries must take the lead both by example and in committedly seeking better global governance. Europe is uniquely positioned to do so, given its unique combination of integrated markets and political and economic institutions, technological know-how, as well as its need for innovation and stronger GHG mitigation approaches.

While all circular strategies should be explored, we need to keep in mind that ultimately the circular economy needs to lead to reduced material and impact footprints in high-income countries, and the mitigation of material footprint growth through circular leapfrogging in developing countries. A particular focus must therefore lie on those models that delink value creation from the mass of physical product sales. This is often referred to as the sharing economy or the service economy. For example, the utilization of cars in Europe is currently as low as 2 per cent (Ellen McArthur Foundation, SYSTEMIQ and Material Economics 2017). Not only must utilization go up, but also the concept of value creation must connect to fulfilling the societal need for mobility rather than selling cars. Concepts such as ‘mobility-as-a-service’, that sells transport kilometres instead of cars, are important in moving towards a decoupling circular economy, in combination with reuse, repair, remanufacturing and close material looping strategies.

A true circular economy will at the same time manage rebound effects, preventing more efficient services leading to unsustainably higher consumption. The challenge of mass consumption leads to another part of the system, namely the way we measure, perceive and promote economic well-being. Current measures of economic progress are currently too closely linked with mass consumption, while not valuing natural capital. The challenge of adapting global measurements of economic development to the resource-pressured reality of the 21st century underlines once more the importance of improving global institutions.

Finally, every step of the transition needs to be fair and inclusive. It will need cross-company and cross-ministry collaboration strategies to ensure that benefits of the circular transition are distributed, and losses compensated fairly.

In summary, the challenge is big, but the benefits ahead are even greater – if we get this right. By purposefully utilizing the vast technological and global cooperation tools that humanity has developed in the last decades, we can achieve a circular economy that ensures fair prosperity within the planetary boundaries.
The *Handbook of the Circular Economy* provides a comprehensive overview of what the circular economy is and does, as well as its limitations. It consolidates the many ways in which the topic has been dealt with in research, business and policy. The *Handbook* is not only relevant, but also essential for those trying to make sense of the plethora of ways in which the term has been interpreted and applied. As it sheds light on different aspects of the technological and governance transitions ahead and will be an important contribution to equipping decision-makers to accelerate the circular economy, we warmly welcome this *Handbook*. We consider it a much-needed reference for those wanting to understand how the circular economy can contribute towards sustainable development.

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REFERENCES

