
INTERNATIONAL SYSTEM CHANGE COMPASS

THE GLOBAL IMPLICATIONS OF ACHIEVING
THE EUROPEAN GREEN DEAL

OPEN SOCIETY
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INSTITUTE

S Y S T E M I Q



This report is co-authored by SYSTEMIQ, The Club of Rome, and the Open Society European Policy Institute, which also funded this work.

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SYSTEMIQ

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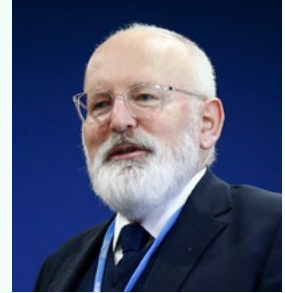
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FOREWORDS

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The climate and biodiversity crises are an existential challenge for humankind. They are wreaking havoc in each and every country, with some already fighting for their very survival. These crises come on the back of a digital industrial revolution that likewise disrupts our societies. If we let them run their course, they will uproot the world as we know it.

The Green Deal is Europe's answer to these challenges. It is an agenda to bring emissions down to zero, rebalance our relationship with our natural environment, and transform industry. It is also an agenda with social fairness and redistribution at the heart.

With half of greenhouse gas emissions and over 90% of biodiversity loss resulting from resource extraction and processing, moving to a circular economy is crucial. Russia's barbaric invasion of Ukraine has been a stark reminder of the relevance of this transition. Whether it's fossil fuels or primary natural resources; we must end our overdependence on finite, outside supplies.

But this is not just about the European Union: The climate and biodiversity crises are global crises. Our policies must support adaptation and mitigation efforts across the world, and spur the necessary changes abroad. This includes taking responsibility for the impact of our consumption in third countries. The European Commission's recent proposals on deforestation and sustainable products exemplify how the Green Deal can help steer a global transition.

While the challenges we face seem daunting and time to act is running out, we can still stem the tide. It requires that we work together across borders, sectors, and systems. This report provides valuable guidance on managing the necessary global change in a just and inclusive manner.

We have the tools to give humanity a shot at survival and ensure the health and wellbeing of generations to come. It's time to use them to their fullest.

Mia Amor Mottley,
Prime Minister of Barbados



The failure to reform the international system has increasingly severe consequences. Unable to stop the tanks rolling into Ukraine, the hoarding of vaccines, and the Earth's rapid warming, the system's dysfunction reflects its underpinnings: Nineteenth-century imperialism and twentieth-century economics that insufficiently values sustainability. It must be reformed now.

Finance is critical to reform. The absence of a climate finance framework for financing loss and damage, adaptation, and mitigation is why little progress has been made. This *International System Change Compass* report argues that the European Green Deal should help drive and fit into a new global framework.

The frontline in the war on climate change lies between the Tropics of Cancer and Capricorn. That is where temperatures and sea levels rise the most, and mortality increases from extreme heat, drought, and flooding. It is where hurricanes wipe out 200% of GDP in hours. There is no point knocking on the door the following morning to sell the victims more debt. We need grants for loss and damage. It should be funded by those who contributed most to the stock of GHGs as they grew rich. A 1% levy on the worldwide consumption of fossil fuels would also work if they won't.

Although they contributed little to the stock of GHGs, frontline states pay a hefty bill to adapt, from more resilient roofs to re-grown reefs. There are few revenue streams for the private sector, so this has to be financed by concessionary loans. Europe should press for the development banks to be recapitalised to provide concessionary loans to the climate-vulnerable. We could use unused SDRs held in central bank reserves for a rainy day. This is that rainy day.

The biggest bill will be for climate mitigation. The low-carbon transition in energy, transport, and agriculture will cost USD 3 trillion a year for 20 years. What matters is that mitigation takes place to scale and speed, not where. Half-mitigation by Europe alone will be pointless.

The only assumption worth making is that we do spend that USD 3 trillion a year. If we don't, we die. The right industrial policy is to develop these technologies and support a global plan, like the one I set out at COP26, to use public money to mobilise private savings to invest in this transition. It's the only way to prevent the climate crisis from becoming a debt crisis. That plan is about saving the world, but it is Europe's best path to prosperity. Armed with this *International System Change Compass* as a guide, Europe should shine the torch and lead the way.

ENDORSEMENTS

Sharan Burrow, General Secretary, International Trade Union Confederation

“In the European Green Deal, the EU set itself the target to “leave no one behind.” Now is the time to deliver. And this promise must be true for governments around the globe with investment in jobs— climate friendly jobs—centerstage. There are no jobs on a dead planet, so at this time of multiple crises we must build an economy and work force that are resilient to future shocks and stresses from health pandemics, climate change, and conflict. The *International System Change Compass* report analyses the global implications of achieving the European Green Deal, unpacks the problems of neo-colonial resource extraction patterns, and shows how to build more holistic green transition partnerships with low- and middle-income countries that are better for people, planet, and prosperity across the board. We must change EU and global rules to build a green and just future for all. The *International System Change Compass* shows the way.”

Leonore Gewessler, Federal Minister for Climate Action, Environment, Energy, Mobility, Innovation, and Technology of Austria

"Our highly globalised world is deeply interconnected and interdependent. That is true when it comes to the current energy crisis because of the invasion of Ukraine and equally so for the biodiversity and climate crises. These challenges emphasize the urgency to make a step-change in the transformation of our systems instead of resorting to incremental adaptations. The European Green Deal (EDG) is crucial if we want to be serious about making this step-change. It gives us the opportunity to take Europe’s responsibility seriously and to make the changes that we urgently need. The *International System Change Compass* provides a highly valuable orientation on how to navigate the EDG in our globalised context and underlines the imperative need to not only carry out the energy and climate transition, but to do so in a just and fair way. Because the EDG does not operate in a secluded space, but in an interconnected system. This is a global challenge, and we can only succeed if we think globally and work globally, too."

Jennifer Morgan, Special Representative for International Climate Policy, German Federal Foreign Office

“Our current systems are no longer fit for purpose—too often reinforcing inequality and polluting behaviour rather than sustainable development or the restoration of natural ecosystems. COVID-19 and extreme climate conditions are just the most recent warnings that we need to start putting the safety and wellbeing of people and planet first. In these times of disruption, business as usual models no longer build long-term prosperity for anyone but a wealthy few. We can continue to take incremental steps and be disrupted or respond to the multiple crises through transformative action to build a better world, resilient to future global crises.

Governments need to push the reset button to ensure that the well-being of the planet and people are prioritised over short-term economic growth. The European Green Deal has the potential to be this reset button for the EU. However, the climate crisis and its impacts don't respect borders, which is why we need to build off the European Green Deal to embrace a new climate foreign policy. This means using all of the EU's external levers—trade, development, financial or security—to solve the global crises now facing humanity. The *International System Change Compass* offers a vision of how to elevate the EU's international relations to build new and just relationships—working with partners to shape new governance structures fit for a healthier future for people and planet.”

Teresa Ribera, Deputy Prime Minister for the Ecological Transition of Spain

“Following the 2020 report on how to implement the European Green Deal in a time of recovery, this new report from the *International System Change Compass* team highlights the global implications of achieving the European Green Deal. This is a most valuable and timely reflection, as Europe seeks to deliver on its climate ambitions while achieving more green strategic autonomy, in light of the interdependencies and vulnerabilities made apparent by the COVID-19 crisis in 2020 and the energy crisis fueled by the Russian invasion of Ukraine in 2022. The EU's commitment to human rights, international development, and ecological balance needs to permeate ongoing discussions on the Fit for 55 package, the decarbonisation of economies, and the need to strengthen governance of global supply chains and trade relations. European decisionmakers will surely welcome the analysis and policy orientations on how to ensure the SDG goals remain central to these debates.”

Evelien van Roenburg, Head of EU Office, Oxfam International

“The ambition of the European Green Deal focuses predominantly on a green and just transition within Europe, whereas the direct and undeniable impact of the climate crisis and the EU’s excessive use of resources falls particularly hard on vulnerable and marginalized communities in low- and middle-income countries. The *International Systems Change Compass* paints a very important picture of how the EGD should be implemented in a globalised and interdependent world, as part of an approach that is rooted in climate justice, that addresses the profound inequality that drives the climate and the resource crisis, and that recognizes the leadership of women and young people in driving the truly just transition we need.”

Achim Steiner, Administrator, United Nations Development Programme

“The *International System Change Compass* details how the European Green Deal will reverberate far beyond the borders of the European Union. It is expected to drive forward profound shifts in global trade flows, value chains, and consumption—helping the world to take decisive climate action and restore our natural world. The findings of the report will also feed into the United Nations Development Programme’s tailored support to 170 developing countries across the world as they work towards the Sustainable Development Goals. That includes unlocking new sources of finance to advance a just transition to clean energy systems, helping to create new green jobs and eradicate extreme poverty, and working with communities to co-create innovative climate action solutions. Together with key partners like the European Union and its member states, the United Nations is co-investing with countries and communities across the world in a greener, more inclusive, and more sustainable future for all.”

Nicola Sturgeon, First Minister of Scotland

“Europe has a historic responsibility to take the lead in the just transition to a net zero and climate resilient future not just at home, but globally. Following centuries of benefitting from greenhouse gas emissions, all countries must now deliver the fastest possible just transition to end their reliance on fossil fuels and shift towards renewable energy and hydrogen—recognising that this is the only way to secure a bright future for our workers, our communities and, of course, our planet. Businesses and the financial sector will be critical partners in realising that fairer, greener future. It is time for Europe to address the twin crises of climate change and biodiversity loss and support the countries that are now suffering the effects of climate change they have done so little to cause. The *International System Change Compass* offers a way forward for achieving the holistic transformation of our economies and international relations that is so desperately needed to address climate justice, develop a circular economy and to leave a habitable, prosperous, and more equal planet to future generations.”

Jutta Urpilainen, European Commissioner for International Partnerships

“The EU believes that global challenges should be tackled, and Sustainable Development Goals put back on track through inclusive, fair, and value-based international partnerships. With our Global Gateway strategy, we will mobilise investments in infrastructure and translate the Green Deal into our external action. The *International System Change Compass* provides crucial insights on how to accomplish systemic, transformational change toward more resilient, greener, and just societies.”

Jeremy Wates, Secretary General, European Environmental Bureau

“This important report is a timely reminder of the global consequences of current European consumption patterns and the EU’s responsibility to reduce its environmental footprint in other parts of the world, as well as domestically. It provides a strong rationale for setting clear, ambitious targets for the reduction of the EU’s resource use and material footprint in absolute terms; this is not only crucial to achieve a more just society living within planetary boundaries but also to reduce Europe’s vulnerability to supply chain disruption of the kind we have seen recently following Russia’s brutal invasion of Ukraine.”

PREFACE

This report builds on the analysis first presented in the *System Change Compass (2020)*, henceforth “*SCC (2020)*,” co-written by The Club of Rome and SYSTEMIQ. The *SCC (2020)* took the European Green Deal (EGD) policy framework as point of departure for systemic transformation—making the case that the EGD insufficiently addresses the drivers and pressures that cause environmental damage.¹ Although the EGD supports building a new model for a more prosperous and fair economy, the implementation policies still often take the incremental approach of “cleaning up” old systems, for example by striving to electrify private vehicles

in the European Union (EU) or encouraging recycling of (mass-produced and under-utilised) products. Such an incremental approach is bound for failure. System change that directly deals with or alters the economic drivers and pressures causing environmental damage across our planet is needed—only then will we transform at the pace science requires. The *SCC (2020)* provided guidance for such an integrated approach and systemic realisation of the EGD and demonstrates how radical resource decoupling, dematerialisation, decarbonisation, and rethinking ownership can lead to human wellbeing and economic resilience.²

“An incremental approach is bound for failure. System change that directly deals with or alters the economic drivers and pressures causing environmental damage across our planet is needed—only then will we transform at the pace science requires”

Like most literature on the EGD, the *SCC (2020)* focused on internal dynamics and required shifts within the European Union (EU). The external dimension and global impacts of the EGD have received much less attention, although they are equally determinant for the success of the green and socially just transition. To address this imbalance in reporting and close the literature gap on these

1 SYSTEMIQ and Club of Rome, *A System Change Compass. Implementing the European Green Deal in a Time of Recovery*, 2020, https://www.systemiq.earth/wp-content/uploads/2020/11/System-Change-Compass-full-report_final.pdf.

2 The *SCC (2020)* in a nutshell: The report addresses the core barriers to a successful and rapid rollout of the EGD along all dimensions of the European policy sphere and provides a set of clear policy interventions to redefine prosperity, progress, the metrics used to measure success, governance, leadership, and the enabling role of finance. This is done by applying the UNEP Driver-Pressure-State-Impact-Response (DPSIR) Framework, which assumes a chain of causal links starting with “driving forces” (economic sectors, human activities) through “pressures” (emissions, waste) to “states” (physical, chemical, and biological) and “impacts” on ecosystems, human health, and functions, eventually leading to political “responses” (prioritisation, target setting, indicators). Building on 30 expert interviews with practitioners across sectors and regions, the report also identifies 50+ emerging industry “champions” that will drive Europe’s transformation towards a more competitive, resource-efficient economy in line with societal needs. These champions—from urban agriculture to seaweed farming and hydrogen technologies—represent scalable sustainable industries that will form Europe’s economic backbone in a net-zero world.

issues, this report—the *International System Change Compass: The Global Implications of Achieving the European Green Deal* (henceforth “*International System Change Compass*” or “*International SCC*”)—examines how EU external relations and trade flows with other states will be impacted by the EGD agenda.

In a globalised world, transforming Europe’s economy and way of living also means transforming the EU’s relationships with partners globally. In doing so, the EU not only has a duty to mitigate negative external impacts and trade-offs, but also a unique opportunity to reshape the resource-driven global governance system that stems from the era of colonialism. Through the means set out in this report, the EU can build relationships with low-income countries (LIC) that overcome historical dependencies and put collaboration front and centre.

Benefiting from the expertise of the Open Society European Policy Institute (part of the Open Society Foundations), this report strives to kickstart an honest and critical conversation about what a green and just social transition could mean for the future pathways of global partners. It also assesses the position of the EU within the resource-intensive global system that it helped shape. The objective is to unpack and outline the wicked problems and identify the key international issues, tensions and trade-offs that will arise. While this report puts forward

“Transforming Europe’s economy and way of living means transforming its relationships with global partners”

some solution pathways to those wicked problems, it cannot fully solve them all. Its main purpose and importance is to start an urgently needed dialogue on what EGD implementation means globally and what kind of systemic policy approaches are needed for its success.

Like the *SCC (2020)*, this report is written as a guidance frame for EU policymakers working on EGD topics. While the normative framework set out in this report as well as the topics covered here are of relevance to everyone with an interest in global governance, this report is of particular relevance to the work of the European Commission, the European Parliament and Council, the European Union External Action Service as well as the member state ministries that would implement the report’s recommendations. Within the European Commission, the following Directorates-General (DGs) and Services’ work is particularly impacted: DG AGRI, DG CLIMA, DG ECHO, DG ENER, DG ENV, DG FISMA, DG INPTA, DG MOVE, DG NEAR, DG REFORM, DG REGIO, DG TRADE, and FPI (for the full names of these departments and services, please see the glossary at the end of this report).

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EXECUTIVE SUMMARY

The challenge of system change:

The interconnected crises of climate change, biodiversity loss, and pollution cannot wait for humans to spend more years discussing solutions, policies, and institutions.

The science is clear: International system change is urgently needed to meet the climate crisis.

Atmospheric concentrations of harmful carbon emissions have never been higher in human history and emissions have increased since 2010 across all major sectors globally. The *Intergovernmental Panel for Climate Change (IPCC): Climate Change 2022, Impacts, Adaptation and Vulnerability (IPCC)* report³ states that current emissions trajectories put the planet on a path to warm by about 3.2 degrees—double the limit agreed in Paris 2015. It concludes that limiting warming to around 1.5°C requires global greenhouse gas emissions to peak before 2025 at the latest to leave the “fast track to disaster.” UN Secretary General António Guterres forecasts “unprecedented heatwaves, terrifying storms, widespread water shortages, and the extinction of a million species of plants and animals.”⁴

With climate change, we face not one crisis but many: More and more people around the world are calling for accelerated action on the planetary emergency and the linked threats to food and water security, biodiversity, and health.

Substantial disruptions to trade because of COVID-19 and the Russian invasion of Ukraine are inevitably creating supply and price shocks throughout global commodity chains. Food and energy prices are rising, and economies are stretched due to lack of fuels, food, fertilisers, and

other resources such as metals and intermediate products needed for the energy transition. Europe’s dependence on imports of energy and resources is one of many reasons to accelerate decarbonisation and reduce resource consumption to boost the continent’s resilience.

At EU level, the European Green Deal (EGD) sets out an integrated approach to a green and just transition by 2050 and a vision for a climate-neutral future. Yet current EGD commitments and related EU policies focus predominantly on the supply side, hardly addressing demand-side measures or the global context and international effects of Europe’s transition towards ecological and social sustainability.

Moreover, the EGD and its initiatives are not tackling the major driver of emissions and environmental degradation—which is overconsumption in high-income countries, including in Europe. The recent *Lancet Planetary Health Report*⁵ is clear: High-income nations are responsible for 74% of global excess material use, driven primarily by the USA (27%) and

“The EGD and its initiatives are not tackling the major driver of emissions and environmental degradation—which is overconsumption in high-income countries, including in Europe”

3 *Intergovernmental Panel for Climate Change (IPCC): Climate Change 2022, Impacts, Adaptation and Vulnerability* (2022).

4 *UN News*, “UN Climate eReport: It’s ‘Now or Never’ to Limit Global Warming to 1.5 degrees,” April 4, 2022.

5 Jason Hickel, Daniel W. O’Neill, Andrew L. Fanning and Huzaifa Zoomkawala, “National Responsibility for Ecological Breakdown: A Fair-Shares Assessment of Resource Use, 1970–2017,” *Lancet Planet Health*, Volume 6, Issue 4, E342–E349, 2022.

the EU-28 countries (25%). China is responsible for 15% of global excess material use, and low-income and middle-income countries in Africa, Asia, Latin America and the Caribbean, and the Middle East are responsible for only 8%. Because high-income countries are the primary drivers of global ecological breakdown, they need urgently to reduce their resource use to fair and sustainable levels.

Two important conclusions follow: First, all the current crises are interlinked, and so are their solutions. Food and energy security, or any other human need related to security, must be prioritised in order to re-establish values, rethink economic systems, and reduce overconsumption. The 2022 IPCC report on impacts, adaptation, and vulnerability highlights the immense potential to reduce demand across sectors, acknowledging that individual behavioural change is insufficient for climate change mitigation unless it is embedded in structural and cultural change. Demand-side mitigation efforts could reduce global greenhouse gas emissions in some sectors by up to 70% by 2050.⁶ Research by the International Resource Panel shows that natural resource extraction and processing account for more than 90% of global biodiversity loss and water stress, approximately half of global greenhouse gas emissions and one third of air pollution health impacts.⁷ Resilience calls for a system change approach to minimise trade-offs and future lock-ins while maximising co-benefits and synergies across efforts.

Second, incremental efficiency gains within the current system will not prevent climate catastrophe. They will not solve the resource crisis, or the biodiversity crisis, or address fundamental injustices. Incremental gains will also fail to address long-term threats to competitiveness. The divide between high-income,

overconsuming countries and low-income economies that rely on extracting natural resources is widening. Only a holistic approach that includes reducing overconsumption can achieve a fair and effective transition towards a true net-zero world: A world with net-zero carbon emissions but also zero biodiversity loss, zero inequality, and zero poverty.

A telling example of the failure to consider international effects is Europe's efforts to replace Russian oil and gas. By buying up available resources on international markets, European governments are driving up energy prices for people and countries that can less afford them. On the positive side, the EU is finally accelerating the installation of renewable energy infrastructure, but it also needs a strategy for major reductions in energy consumption to prevent a new scramble for raw materials—with all its detrimental effects for extracting countries. For the sake of the global transition, as well as the European Green Deal, the EU needs to reduce its materials imports, facilitated by a transition to a circular economy. A European economy that consumes less from long global supply chains will be more resilient, as well as more sustainable.

This report aims to provoke a debate about what a green and socially just transition could mean for the future pathways of many economies, as well as the position of the EU within the resource-intensive global system that it helped to create. It unpacks the key international issues, tensions, and trade-offs that will arise on the path to sustainability. The authors put forward potential solutions to some of the most severe problems and strive to start a discussion about the implications of implementing the EGD globally and the kind of systemic policy approaches are needed for its success.

6 Intergovernmental Panel for Climate Change (IPCC): *Climate Change 2022, Impacts, Adaptation and Vulnerability*, Summary for Policymakers (2022): 44 et seq.

7 International Resource Panel (IRP), *Resource Efficiency and Climate Change - Material Efficiency Strategies for a Low-Carbon Future* (2020).

“The success of the European transition is linked to the global transition”

At the heart of the report is the realisation that **the success of the European transition is linked to the global transition: Individual efforts and EU policies that are at odds with a shift towards green, just, and resilient economies and societies elsewhere can never bring a green, just, and resilient future for Europe.** In a globalised world, transforming Europe’s economy and way of life also means transforming the EU’s relationships with partners globally. The EU not only has a duty to mitigate negative external impacts and trade-offs, but also a **unique opportunity to reshape the resource-driven global governance system founded in the era of colonialism.**

Through the actions and policies set out in this report, the EU can build relationships with low-income countries in ways that overcome historical dependencies and put collaboration front and centre. This report provides recommendations to policymakers on how to implement a climate-neutral vision for Europe that helps restore the balance between people, planet, and prosperity not just within Europe but globally. As the report demonstrates, this shift in international relationships requires radical system change that involves all segments of society. Current levels of resource consumption in Europe are not only unsustainable, but they also fail to maintain key social functions; for example, mobility systems dominated by private vehicles are plagued by traffic jams, fossil energy use and decreasing productivity. Europe must open new possibilities for international partnerships that go beyond cheap resource extraction. It must recognise that joint innovation and investments in circular and clean business models are necessary for sustainable prosperity.

Collaboration within the European institutions also needs to improve. Successful implementation of the EGD requires a whole-of-government approach, including foreign,

security, development, and trade policies. This requires much closer collaboration between the European Commission’s Directorates-General (DGs), agencies, and national governments to achieve unity of effort. System change requires a change in the EU’s mode of operation. Policy areas need to be more closely aligned to address the profound interdependencies involved in the climate transition.

The compass to guide system change

Radical system change in line with the EGD’s ambitions requires EU policymakers urgently to create a plan to address three main goals:

1. To create the green, just, and resilient future that the EGD seeks to achieve, the EU must work towards **system change in international relationships** and use this as an opportunity to display truly transformative leadership, not just at home but globally. To achieve a green and fair future for all, collaboration needs to be at the centre of governance and leadership, replacing the goal of economic growth at the expense of others. System change goes beyond the mere mitigation of negative impacts of the current global economic model. It entails reshaping a resource-driven global governance system that was built to perpetuate existing power dynamics and unequal consumption patterns. It requires the creation of new indicators for economic development. This means reshaping resource-driven imperialist relationships and overcoming historical dependencies—instead building trust-based relationships with partners. It also means addressing the relational imbalances between high-income and low-income countries and regions—in bilateral relations as well as in international fora of collaboration.

“Successful implementation of the EGD requires a whole-of-government approach, including foreign, security, development, and trade policies”

“The EU can make its supply chains and energy sources less vulnerable, not just by diversifying sources but by building a sustainable economy”

2. Following Russia’s invasion of Ukraine and the consequent energy, food and materials crisis in Europe, the EU must **invest in avoiding future security crises and potential conflicts through decarbonisation and reduced resource consumption to enhance independence**. The war has jolted the EU into rapid action on energy, food, and industrial policies, but with some setbacks for the climate transition, such as the burning of more coal. While some short-term constraints are inevitable, the long-term plan formulated in the EGD remains essential to prevent further crises over energy, food, water, and other resources.

A decarbonised and dematerialised economy is far more resilient as it addresses all the current crises at once: The **multiple environmental crises of climate change, biodiversity loss, and pollution are all connected to inefficient use of natural resources**. These crises have created insecurity in the form of fragile supply chains and disruption of food and energy supplies. They heighten the risk of future conflicts over resources. The EU should redouble its efforts to make its supply chains and energy sources less vulnerable, not just by diversifying sources but by building a sustainable economy in order to build geopolitical independence. For example, the most appropriate solution to the current shortage of semiconductor chips in automotive production chains is to move to car sharing—instead of individual car ownership—within an integrated mobility system, combined with labour patterns that reduce the need for travel. The savings in resource costs related to mobility could amount to EUR 247

billion annually, offsetting other macroeconomic costs of the crisis.⁸

This decarbonisation and dematerialisation pathway requires **fundamental shifts in the current understanding of prosperity, and in the incentives that are built into our economic system**. Given that the drivers and pressures of environmental and social degradation lie in over-use of virgin resources, European leaders must actively plan for a reduction in overall use, including imports of raw materials. The EU needs to prepare industries for changes in taxes, prices, and regulation to achieve this reduction.

3. The EU needs to find a new balance between **retaining productive industry at home while also enabling a just transition globally**. In this transition, the EU can be a partner for regions that currently depend on exporting to European markets, collaborating with those regions to advance them along their chosen pathways towards sustainable wellbeing and resilience. This requires a new understanding of metrics and competitiveness. The historical approach was to outsource much of European production (and emissions) to countries with cheap resources and labour. This model is incompatible with the ambition of ensuring climate neutrality, resilience, and sustainable development and keeping human activity as a whole within planetary boundaries. To develop new partnerships for transition, the EU must help ensure that local resources are available for domestic development, and it must deploy European technological and financial capacities for mutual benefit.

This report’s recommendations create a systemic approach. They need to be prioritised equally. Choosing a few and otherwise continuing with business as usual will not suffice. **Only a holistic approach will lead to the necessary transition.**

8 Material Economics, *The Circular Economy a Powerful Force for Climate Mitigation*, 2018, 6&48, <https://materialeconomics.com/publications/the-circular-economy>.

“This is not about what the EU must ‘give up’ to implement a green and social agenda. It’s about how a just global transition benefits people and increases their wellbeing”

Importantly, this is not a story about what the EU needs to “give up” for successful implementation of its green and social agenda. This is a story about how a just global transition will benefit people across all continents, from improved health and wellbeing to intact ecosystems and resilient relationships, including those of the European Union.

This report sets out:

- The 10 Compass principles (key means to address the drivers and pressures of our economic system) to demonstrate the systemic change needed for successful EGD implementation, both in Europe and other regions. These principles were first laid out by the *System Change Compass* in 2020 and form its normative and analytical framework. This report will also derive key policy recommendations from each of the 10 Compass principles to implement the EGD in a way that is beneficial for the EU as well as its trade partners (Chapter 2).
- An analysis of the specific tensions and opportunities of a green and socially just transition for the EU’s trade relations in eight economic ecosystems: The built environment, healthy food, intermodal mobility, consumer goods, nature-based, energy, circular materials, and information and processing (Chapter 3).
- How the EU can leverage its role in international fora to drive the systems change needed to implement the EGD while being fair to other countries (Chapter 4).
- A vision of the future when Europe has successfully led a systemic international transition to sustainability and improved quality of life around the world.

POLICY RECOMMENDATIONS

This report develops three sets of recommendations for policymakers:

1. Principles and system-level orientations on how EU policymakers can achieve the vision of the EGD and SDGs and ensure a green and socially just transition.
2. A second set of recommendations related to the global implications the transition will have across eight economic ecosystems.
3. A final set on the global governance innovations that will be needed across three horizons.

These sets of recommendations are summarised in turn below.

The Compass as analytical framework and derived policy recommendations

The International System Change Compass translates system change into concrete policy shifts and actionable recommendations to policymakers. The Compass wheel highlights in its 10 principles the foundational premises and paradigms that our current system is based on while identifying the concrete policy shifts necessary for a true reset and achievement of the just and green future envisioned in the EGD.

PRINCIPLE 1: REDEFINING PROSPERITY

Leave neocolonial resource extraction patterns behind and fairly distribute the value created in supply chains.

PRINCIPLE 2: REDEFINING NATURAL RESOURCE USE

Reduce material footprints in high-consuming countries; build ecologically and socially sustainable systems in low-income countries.

PRINCIPLE 3: REDEFINING PROGRESS

Maximise wellbeing through context-specific, nationally determined transition pathways.

PRINCIPLE 4: REDEFINING METRICS

Measure the full impact of national consumption and production on global planetary boundaries and social wellbeing.

PRINCIPLE 5: REDEFINING COMPETITIVENESS

Apply collaborative and mission-oriented methods between countries and at company-level to enhance global societal wellbeing, particularly for the least well-off.

PRINCIPLE 6: REDEFINING INCENTIVES

Create transition-supporting economic and legal incentives by ending unsustainable subsidies, recognizing the value of ecosystems, and ensuring transparency and accountability in global value chains.

PRINCIPLE 7: REDEFINING CONSUMPTION

Raise environmental and social standards of products globally and move from owning to using where beneficial.

PRINCIPLE 8: REDEFINING FINANCE

Increase capacity to finance positive, regenerative change while making the financial system equitable.

PRINCIPLE 9: REDEFINING GOVERNANCE

Provide sustainable stewardship of global resources through equitable and science-based governance systems.

PRINCIPLE 10: REDEFINING LEADERSHIP

Be good neighbours and ancestors by building trust across geographies and generations through inclusive and long-term decision-making.

To help activate these 10 principles, the report sets out **30 policy recommendations** (“system-level orientations”) that address the core external challenges and impacts of EGD implementation (please see Chapter 2.2 for these recommendations).

International implications of the transition in economic ecosystems

A systemic transition in Europe will have profound implications for international trade flows and relationships. Challenges and opportunities will arise from dematerialising and decarbonising the major economic activities that serve societal needs (economic ecosystems) in the EU. Chapter 3 analyses these challenges and opportunities across eight economic ecosystems. Based on that analysis, this report provides **recommendations to EU policymakers for achieving fairer and more sustainable international dynamics across all ecosystems:**

- **Develop a knowledge base of in-depth impact assessments per economic ecosystem.** This knowledge base should provide information on the expected impacts of a systemic EGD implementation along international value chains, and flag current dependencies.
- **Promote highly efficient material resource use for low-carbon products and technologies in European markets to avoid a mining boom in resource-rich countries.** A sudden surge in material requirements from decarbonisation efforts in the EU linked to the demands of renewable energy production could cause large-scale environmental damage in resource-rich countries.

- **Cooperate with international trade partners to identify synergies between European sustainability standards and LMIC’s domestic policy goals.** Such cooperation could be the basis for future partnerships and for shaping development strategies in a co-creative way.
- **Incentivise and enable European companies to reduce the negative footprint of their exports and implement sustainability measures across their international subsidiaries.** Instead of “dumping” unsustainable products on the global market or shifting unsustainable production to other parts of the world, the EU could pursue different policies and financial incentives, as well as bridging potential short-term losses.
- **Create financial mechanisms and engage the private finance sector to make additional funds available for LIC that want to adapt their production systems so they are more circular and less-carbon-intensive.** This can make LIC production systems more competitive and allow these countries to pursue other policy priorities.
- **Support the local availability of technological capacity that enables LIC to champion low-carbon and circular business models, bridge losses in previous export segments, and leapfrog to sustainable technology pathways.** This can include facilitating broader technology transfer, supporting context-adjusted innovation, and providing amnesties on intellectual property rights where needed. Initiatives such as these could be inspired by, or linked with, the UN Technology Facilitation Mechanism that encourages multi-stakeholder collaboration to provide LIC with access to technologies needed for achieving the SDGs.

The aim of these recommendations is to show how the EU could address trade-offs and ensure that the transitions of economic ecosystems along the value chains are socioeconomically just. This includes recommendations on how negative external effects of a transition can be mitigated. The recommendations also show how environmental and social costs currently incurred in the production of European consumption goods abroad can be internalised. While some sustainability transitions will be challenging in terms of fair international impacts, they **also offer significant opportunities to improve the stark environmental and social imbalances in current trade relationships.**

Ultimately, the transition in Europe must ensure that the environmental footprint of the EU’s exports is reduced. The EU must also pursue these changes in ways that mitigate potential short-term negative impacts and create opportunities for trade partners, thereby allowing them to achieve their own environmental and social policy goals and continue trading with Europe.

The EU can lead in the creation of innovations to solve crucial global governance⁹ gaps that impede a fair global transition

Based on the overarching Compass principles, together with the transition needs of each economic ecosystem, **this report identifies the key gaps in global governance that are stalling a coherent transition to sustainable and fair global resource flows:**

⁹ Global governance refers to the complex of rules, policy interventions, and institutions that are used to manage international and transnational interactions within and among the state, civil society, and the private sector. In contrast to the narrow definition of governance exclusively focused on non-hierarchical modes of steering society and private transnational actors, the authors apply the more comprehensive understanding which comprises hierarchical as well as public-private and private modes of governance and considers their interactions.

- International institutions tend to be shaped by the paradigm of so-called neoliberal economics that usually leads to the pursuit of short-term GDP-based economic interests rather than long-term human development.
- International institutions suffer from a lack of legitimacy due to insufficient representation of LIC interests, scientists, and nongovernmental actors.
- The global governance landscape is highly fragmented and suffers from siloed approaches that lead to a lack of policy coherence.
- The current governance of international markets and value chains does not sufficiently incentivise sustainable resource use and does not reflect the true costs of natural resource extraction.
- The international community lacks a shared understanding and joint targets regarding global resource use and fair distribution of associated benefits.

The report then offers an initial assessment of how to remedy those gaps. Opportunities to overcome global governance challenges include:

- Adjusting the specific governance mechanisms that currently shape global value chains (Horizon 1).
- Bridging the institutional gap for sustainable global resource management (Horizon 2).
- Institutional redesign for the long-term improvement of the legitimacy and effectiveness of key international institutions (Horizon 3).

Some gaps might be remedied by mobilising existing international institutions, others will require reforms or even new institutions.

Adjusting governance mechanisms that currently shape global value chains (Horizon 1)

Addressing specific gaps and constraints in international market governance can be an approach **to help internalise climate and resource extraction costs, avoid resource overuse, and ensure fair wages and decent working conditions throughout value chains.** This section of the report looks at the **concrete steps** that can be taken to implement specific system-level orientations that can transform global market governance. It examines the kind of cooperation and negotiations necessary to take these steps. And it identifies organisations and transnational governance programs that would need to be involved. These steps include:

- Creating an international level playing field by strengthening the accountability of multinational companies for upholding environmental and social standards along value chains.
- Launching international research and consultation efforts on how intergovernmental cooperation on fiscal policies can contribute to a more just distribution of benefits from resource extraction.
- Accelerating green technology transfer and capacity building by adjusting intellectual property rights (IPR) governance, trade agreements, and carbon and nature accounting systems.
- Phasing out subsidies and tariffs with adverse environmental and distributional effects by adjusting WTO classifications and trade agreements and promoting reform efforts.
- Shifting financial incentives towards rewarding sustainable resource use by harmonising sustainable investment frameworks and reporting standards.
- Developing clear, practical, and consistent guidance on best practices in competition and antitrust regulations to foster sector cooperation on sustainability.

Bridging the institutional gap for sustainable global resource management (Horizon 2)

While significant progress can be made through changing the way existing governance mechanisms function, there remain gaps with respect to the governance of natural resource management. **To govern a global transition to sustainable natural resource use in a coherent way, new governance arrangements and initiatives are needed that focus explicitly on resources, thereby addressing current institutional gaps.** Some observers are calling for new cooperation on resource governance and starting exploratory conversations on developing an international agreement on natural resource management.¹⁰

By focusing on resource use, the global policy community has the opportunity to demonstrate a new era of global governance, making both negotiation processes and eventual multilateral agreements/global targets more inclusive, engaging, and better able than current agreements to prompt concrete action.

The report identifies the following key means to bridge the institutional gap:

- Strengthening the international agenda for resource governance.
- Providing a foundation for new governance arrangements by creating and making transparent data on resource use and its impacts widely available.

- Developing new governance arrangements that facilitate innovative mechanisms for financing the global transition to sustainable and equitable resource use.

Institutional redesign for the legitimacy and effectiveness of key international institutions (Horizon 3)

There is consensus in the literature on the need to address the **“crisis in multilateralism” that is linked to the insufficient legitimacy and effectiveness of key international institutions.** A number of publications draw the conclusion that the current institutional backbone of the global governance architecture—based on the post-war establishment of the Bretton Woods institutions, the UN Charter of 1945, and the signing of the General Agreement on Tariffs and Trade (GATT)—should be fundamentally reformed, as it still reflects the uneven distribution of power at that time. These publications call for a new international order based on an amended UN Charter that would give central place to fundamental principles of good governance.¹¹ Other scholars highlight the need for more incremental institutional reforms of existing international organisations. Both approaches highlight the following needs:

- Strengthening legitimacy through just and diverse representation.
- Strengthening effectiveness through policy coherence and redefining guiding paradigms across international institutions.

10 Colette van der Ven, *An International Agreement on Natural Resource Management: An Overview of the Opportunities and Challenges* (TULIP Consulting, February 2022), 61, <https://www.tulipconsulting.ch/post/an-international-agreement-on-sustainable-resource-management>.

11 For example, Augusto Lopez-Claros, Arthur L. Dahl, and Maja Groff, *Global Governance and the Emergence of Global Institutions for the 21st Century*, 1st ed. (Cambridge University Press, 2020), <https://doi.org/10.1017/9781108569293>.



International diplomacy as the ultimate multi-issue problem solving arena

As the world approaches ecological and social tipping points, leaders have committed to action in their domestic arenas. The only logical conclusion of these commitments—and the one that is required for success—is to include the international sphere in actively solving the global crises now facing humanity. International relationships, trade, and governance are not indirectly affected areas of the global race to bring human activity within earth’s planetary boundaries. They are, and must be, part of the driving force to create solutions and accelerated action. This report is a call to action to make international relationships, trade, and value chains part of the solution to humanity’s ecological and social crises. It is a necessary change if we are to keep promises across regions and to future generations.

This means policymakers must deliberately plan for managing the international effects of their policies, and it means diplomats must think in terms of joint innovation, partnerships, and increasingly dematerialised trade relationships.

A vision of the future

This report provides a guide for European leaders to **take account of how the green and social transition envisioned in the EGD will change international relationships and require new forms of collaboration and governance.** Many complexities and pitfalls abound in this global transition. However, it promises a future where people enjoy a better quality of life thanks to well functioning, accessible, clean, and healthy economic and financial systems around the globe that serve people and planet at the same time. With improved social cohesion and connectedness, people will enjoy the value of nature more directly and equitably while experiencing a new sense of security—both environmental and geopolitical—with stabilized environmental conditions and social safety nets. Using the systemic analysis presented in this report, not only can Europe attain its ambitions of a green continent, but humanity can achieve global wellbeing within planetary boundaries.

1. INTRODUCTION

The European Green Deal is the European Union's strategy to transform the EU via a just and inclusive transition into a fair and prosperous society, with a modern, resource-efficient, decoupled, and competitive economy that is net-zero in 2050.

In 1972, The Club of Rome's *Limits to Growth* report issued the first warning about unsustainable human activity on our planet and the risks of straying beyond our planetary boundaries.¹² At that time, its authors, Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, and William W. Behrens III, representing a team of 17 researchers at the Massachusetts Institute of Technology, made the case that unlimited growth in population, material goods, and resources on a finite planet would eventually lead to the collapse of Earth's environmental and economic systems.

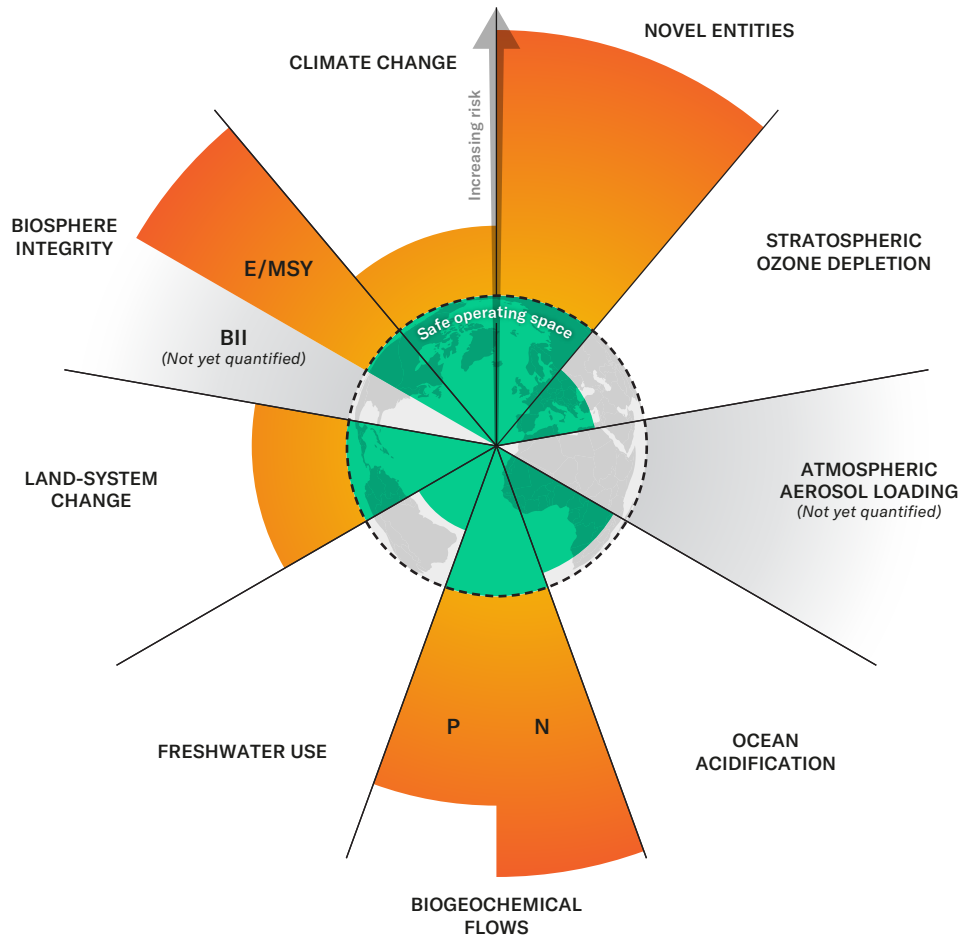
Today, 50 years later, we—as a global community—are experiencing the real impact of the encroachment of humanity on these limits through COVID-19. We live in an increasingly turbulent world with rising pressures on people and planet triggering extreme shocks, like disease outbreaks, droughts, floods, and heatwaves.¹³ As a result, global awareness of the “limits to growth” is building. **If we continue the path we are on, of transgressing planetary boundaries with our greenhouse gas (GHG) emissions, resource extraction, deforestation, and material use, we risk destabilising the planet and entering a “Hothouse Earth” scenario.**¹⁴

12 Report is available here: <https://www.clubofrome.org/publication/the-limits-to-growth/>

13 The Club of Rome and The Potsdam Institute for Climate Impact Research, *Planetary Emergency 2.0 Securing a New Deal for People, Nature and Climate*, August 2020, <https://www.clubofrome.org/publication/the-planetary-emergency-plan/>.

14 Will Steffen et al., “Trajectories of the Earth System in the Anthropocene,” *Proceedings of the National Academy of Sciences* 115, no. 33 (August 14, 2018): 8252–59, <https://www.pnas.org/doi/10.1073/pnas.1810141115>.

FIGURE 1
Planetary boundaries



Source: Designed by Azote for Stockholm Resilience Centre, based on analysis in Persson et al. 2022 and Steffen et al. 2015¹⁵

15 Stockholm Resilience Centre, "Planetary Boundaries," 2015, <https://www.stockholmresilience.org/research/planetary-boundaries.html>. In the figure, BII stands for Biodiversity Intactness Index; E/MSY (also in the biosphere integrity section) stands for extinction rate (extinctions per million species per year); P stands for the inflow of phosphorus to oceans (i.e., the increase compared to natural background weathering); and N stands for the amount of N₂ removed from the atmosphere for human use.

To meet the challenge of “living within limits,”¹⁶ political agreements like the Paris Climate Agreement and policy frameworks like the United Nations Sustainable Development Goals (SDGs) are in place and seek to provide answers to the question of how to reshape our societies and economies to ensure wellbeing and prosperity within planetary boundaries. The question is whether growing awareness and headline commitments will be translated into consistent and systemic policy shifts quickly enough.¹⁷

At the European level, the EGD sets out an integrated approach to a green and just transition by 2050 and a vision for a climate-neutral future.¹⁸ Importantly, the EGD underlines the importance of the green transition being a just transition. The EGD tries to lay out an integrated approach to the climate, biodiversity, and health crises by directing its efforts at taking carbon out of the system. This focus insufficiently addresses the drivers and pressures that cause environmental damage (e.g., overconsumption, unsustainable use of materials and resources, poverty, and inequality). These efforts are insufficient, and their implementation will not achieve the results intended by the EGD.

A just transition: “No one is left behind.”

The just transition concept recognises that the transition towards environmentally sustainable economies can come with major social challenges, such as the displacement of workers, job losses in certain sectors as well as higher energy and commodity prices disproportionately impacting low-income households. A just transition entails the deliberate effort to plan for, and invest in, a transition that supports decent work for all, social inclusion, and the eradication of poverty. The goal is to ensure that the benefits of a green socio-economic transition are shared equitably and that those who stand to lose in the short term—whether workers in coal mine regions in Poland or displaced forest communities in Uganda—have access to alternative means of income, health services, education, and employment programmes.¹⁹

16 See also: <https://www.clubofrome.org/ltg50/>

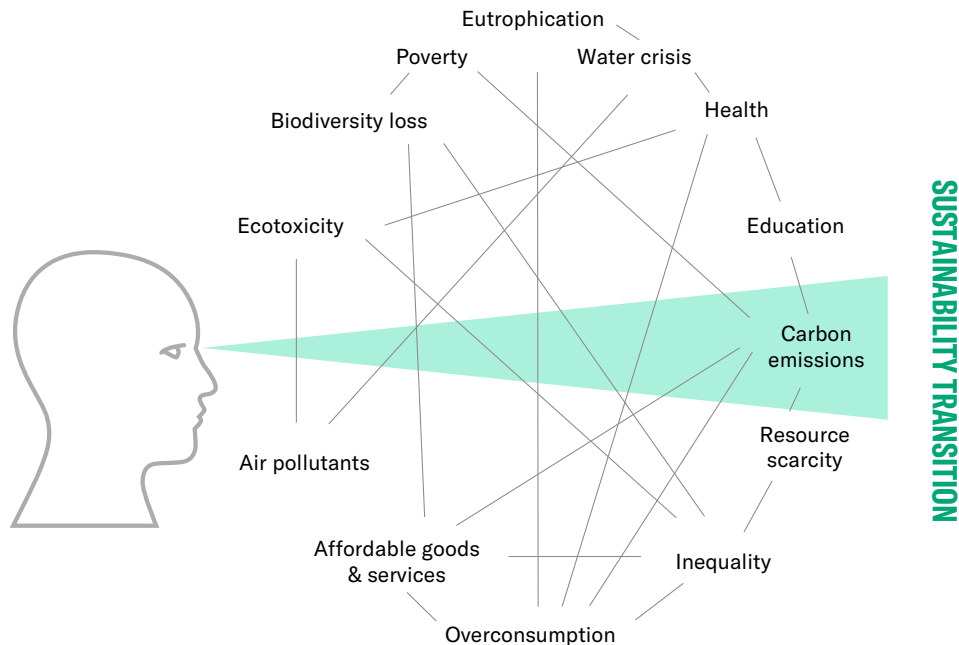
17 For example, among the highly polluting and high-income countries, only very few of the recent NDCs or Long-Term Strategies submitted to UNFCCC refer to solutions of systemic resource efficiency such as active and shared mobility systems. But this systemic shift, integrated with global partners and value chains, is especially necessary for high-income countries where most of the drivers and pressures for high emissions and resource consumption originate.

18 European Commission, “A European Green Deal: Striving to Be the First Climate-Neutral Continent,” accessed January 10, 2022, https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.

19 The Club of Rome and The Potsdam Institute for Climate Impact Research, *Planetary Emergency 2.0 Securing a New Deal for People, Nature and Climate*.

FIGURE 2

Carbon Tunnel Vision: Net-zero carbon emissions are only one part of true net-zero (which also requires zero biodiversity loss, zero inequality, and zero poverty) and a sustainable future.



Source: Jan Konietzko (2022), Carbon Tunnel Vision.²⁰

The System Change Compass (2020) described the required systemic interventions to implement the European Green Deal within the European Union.

If the EU is serious about achieving the SDGs and implementing the EGD vision for a just and green society, incremental shifts towards optimising efficiency in our current systems are not enough. Science clearly indicates that doing more of the same a bit cleaner is not going to limit global warming to 1.5 °C, regenerate the natural environment or reduce pollution and related health issues globally.²¹

What is required is a radical departure—a systemic transformation. **Although the EGD supports building a new model for a more prosperous and fair economy, the implementation policies still often take the incremental approach of “cleaning up” old systems, for example by striving to electrify private vehicles in the EU or by encouraging the recycling of (mass-produced and under-utilised) products.** As an antidote to incrementalism and the blind spots induced by focusing solely on carbon emissions, the *SCC (2020)* by SYSTEMIQ and The Club of Rome proposed an integrated approach to policymaking

20 Jan Konietzko, “Moving beyond Carbon Tunnel Vision with a Sustainability Data Strategy,” Digitally Cognizant, February 8, 2022, <https://digitally.cognizant.com/moving-beyond-carbon-tunnel-vision-with-a-sustainability-data-strategy-codex7121>.

21 For further explanation of the scientific evidence for the need of systems change in resource use, production, and consumption, see the work of the UN International Resource Panel, in particular *Building Biodiversity* (2021) and *Building a Climate for Prosperity* (forthcoming).

by providing guidance for a systemic realisation of the EGD within the European Union. It described how radical resource decoupling, dematerialisation, decarbonisation, and rethinking ownership can lead to human wellbeing and economic resilience.²²

COVID-19 emphasised the need for solidarity and showed that society can rapidly transform but also laid bare human shortcomings in solving interrelated global challenges.

One year after the publication of the EGD, the lasting effects of a global health crisis have markedly impacted EU policy ambitions. While much political attention has focused on remedying the economic and health impacts of COVID-19 in the short term, the pandemic exposed the state of the planetary emergency and the need for a long-term, green and socially just transition. Importantly, as the world locked down and national borders closed, global interdependencies and interconnectedness became glaringly obvious: We—as global society—are all in this together.²³ But are we really?

As with climate change and biodiversity loss, the COVID-19 pandemic disproportionately impacted vulnerable and marginalised communities. Debates around the need for solidarity and a “united response,” most obviously in the case of unequal access to vaccinations, revealed the unequal weight of political power in Europe and globally. A similar dynamic exists in conversations around the reduction of emissions and the Paris Agreement targets at international negotiations such as the United Nations Framework Convention on Climate Change Conference of State Parties (COPs), where

the voices of those who are most heavily impacted and on the frontlines of climate change are absent or underrepresented.²⁴ Historically, it is political representatives from highly developed regions like the EU who dominate international negotiations and make decisions that directly impact “most of the world,” including regions most vulnerable to climate change. For example, the United States and the EU were loudest in objecting to the inclusion of a loss and damage facility in the Glasgow Climate Pact. During the November 2021 climate conference COP 26 in Glasgow, all the developing countries under the Group of 77 and China put forward language for the creation of the Glasgow Facility. The proposal would have provided financing for solutions to loss and damage as part of the outcome of COP26 but its proponents were ultimately outweighed. This unbalanced relationship must be redressed if we are to truly decouple GHG emissions from consumption and material use and reduce our overall ecological footprint.

To create the green, just, and resilient future that the EGD seeks to achieve, it must also work towards system change in international relationships.

With the publication of the EGD, the EU positioned itself to spearhead not just the European, but the global transition towards a green, socially just, and resilient future. Climate diplomacy was put forward as a core component of the European Commission’s vision for “strategic autonomy” to support its ambition on the global playing field.²⁵ This conversation has recently received new meaning in light of the ongoing war in Ukraine. Much has been written about the EGD

22 See footnote 2.

23 European Commission, “Von Der Leyen on Coronavirus Response: EU to Be Determined and United,” accessed January 10, 2022, https://ec.europa.eu/commission/presscorner/detail/sv/ac_20_466.

24 Sandrine Dixson-Declève, “COP26: Forgoing the Planetary Emergency and Adopting Incrementalism,” November 19, 2021, <https://www.clubofrome.org/blog-post/dixson-decleve-cop/>.

25 European Commission, “The European Green Deal,” n.d., accessed January 10, 2021.

and related policy packages since its presentation in December 2019.²⁶ Yet, most literature applies a Eurocentric lens and focuses on internal dynamics and shifts within the European Union.²⁷ The external dimension and global impacts of the EGD receive much less attention (beyond emphasising partners also have a responsibility to ensure a global transition²⁸), although they are equally determinant for the success of the green and just transition.

In a globalised world, transforming Europe's economy and way of living also means transforming the EU's relationships with partners globally, and assessing historical dependencies and underlying assumptions of power.²⁹

In doing so, the EU not only has a duty to mitigate negative external impacts and trade-offs, but also a unique opportunity to reshape the resource-driven

global governance system that stems from the era of colonialism. Through the means set out in this report, the EU can build relationships with low-income countries that overcome historical dependencies and put collaboration front and centre.

Europe is outsourcing much of its production (and associated pollution) to low-income countries, while drastically overreaching the planet's biophysical carrying capacity.

The current global system is far from being green and just. There is still a long way to go before reaching a true “net-zero”—that includes not just net-zero carbon emissions, but also zero biodiversity loss, zero inequality, and zero poverty. Impact footprints of high-income countries (land-use related biodiversity loss footprint and climate change

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- 26 Audrey Mathieu, “The European Green Deal—A Success Story? Nation States Must Now Make the next Move,” Heinrich-Böll-Stiftung, May 10, 2021, <https://www.boell.de/en/2021/05/10/european-green-deal-success-story-nation-states-must-now-make-next-move>; Teresa Belardo, “What You Need to Know about the European Green Deal - and What Comes Next,” World Economic Forum, July 13, 2021, <https://www.weforum.org/agenda/2021/07/what-you-need-to-know-about-the-european-green-deal-and-what-comes-next/>.
- 27 Simone Evans and Josh Gabbatiss, “Q&A: How ‘Fit for 55’ Reforms Will Help EU Meet Its Climate Goals,” *Carbon Brief*, July 20, 2021, <https://www.carbonbrief.org/qa-how-fit-for-55-reforms-will-help-eu-meet-its-climate-goals>.
- 28 Chapter III of the EGD outlines the position of “*the EU as a global leader*” and the need for a global response to the global challenges of climate change and environmental degradation: The EU “*will develop a stronger ‘green deal diplomacy’ focused on convincing and supporting others to take on their share of promoting more sustainable development*” for “*as the EU’s share of global emissions is falling, comparable action and increased efforts by other regions will be critical for addressing the global climate challenge*” [emphasis added]. Although the EGD acknowledges that the EU’s ecological transition “*can only be fully effective*” if global partners “*also take effective action*,” the text steers clear of reflecting on how this broader transition in Europe may impact other regions and global dependencies. Similarly, the Global Gateway connectivity strategy (complementing the US Build Back Better World and offsetting China’s Belt and Road Initiative) takes this as a starting point for the EUR 300 billion investment plan to aid a global recovery and “*redesign how we connect the world to build forward better*” —but then singles out “*reinforcing the resilience of our supply chains*” by investing in green infrastructure abroad and exporting European technology as a means of ensuring sustainable connections that work for people and the planet. See https://ec.europa.eu/info/sites/default/files/european-green-deal-communication_en.pdf and https://ec.europa.eu/info/sites/default/files/joint_communication_global_gateway.pdf.
- 29 For example, trade relations perpetuate neocolonial power dynamics with little regard for local ecosystems: Today, France imports cocoa from Madagascar, where the Theobroma (cacao) tree was first introduced by French colonists in the 19th century and its cocoa has since become a primary agricultural product—alongside coffee and bananas, also brought to Madagascar by the French. However, Madagascar’s incredible biodiversity is increasingly under threat by destructive farming practices including ‘slash and burn’ in the cocoa filled forests by cocoa farmers attempting to meet the growing European demand for cocoa. See also: <http://www.colby.edu/personal/t/thtieten/defor-mad.html>

footprint) are three to seven times greater than those of low-impact countries.³⁰ Not surprising, if you consider that the yearly energy usage of an efficient European refrigerator-freezer is equal to the annual kilowatt hours of electricity consumed per person in Kenya.³¹ Europe's outsized role has enormous effects on nature and climate:

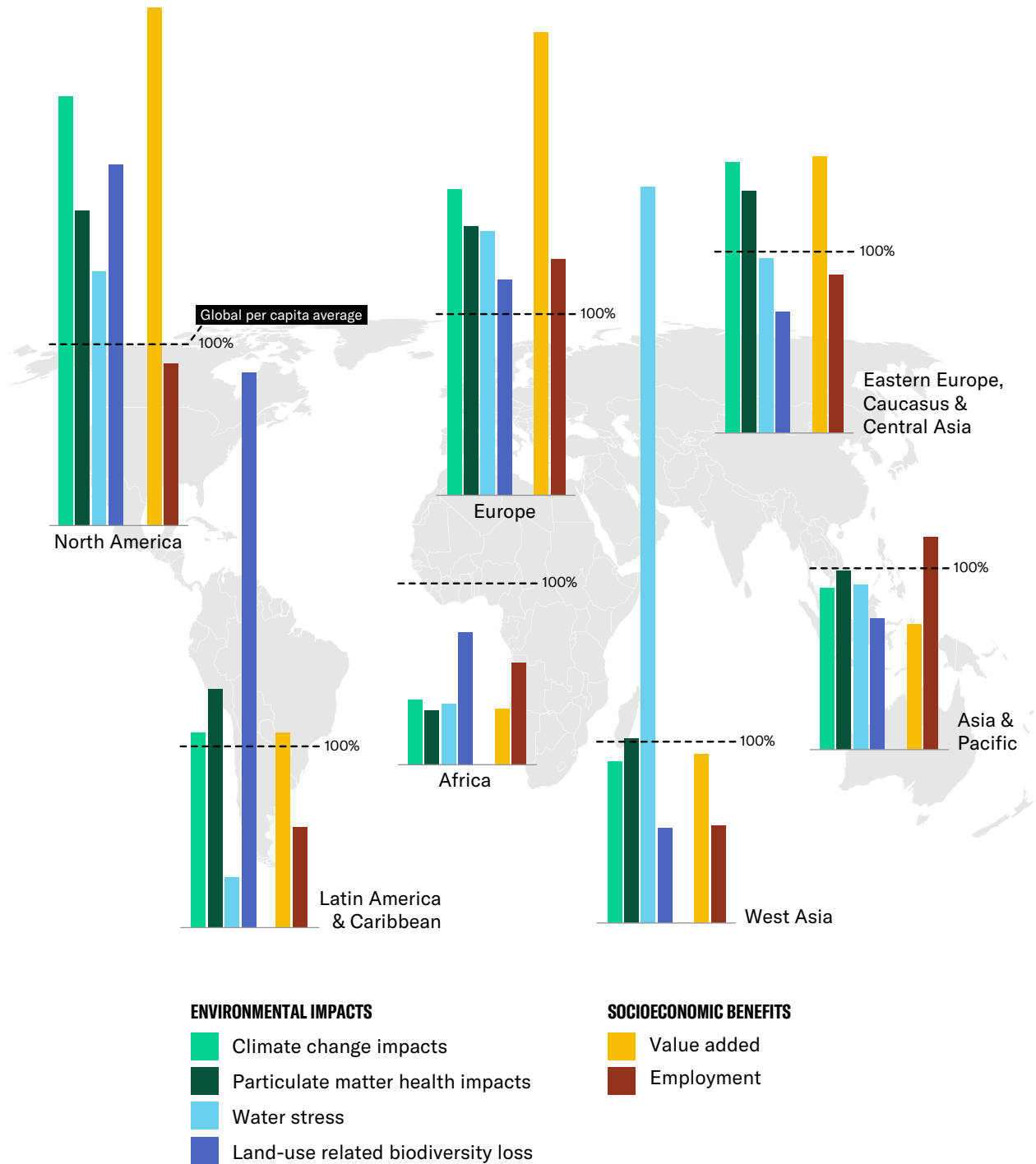
The EU is the world's largest trader of manufactured goods and services, the prime destination for international investments and the top trading partner for 80 countries (in comparison to 20 countries for the United States).³² The EU is responsible for 17% of tropical deforestation linked to internationally traded commodities like meat, palm oil or soy—and therewith is the largest contributor to tropical deforestation and associated emissions after China.³³

The extraction and processing of natural resources accounts for more than 90% of the world's biodiversity loss and water stress and approximately half of humanity's climate change impacts.³⁴ In terms of continents, only Europe and North America are net importers of material resources³⁵—with significant vulnerabilities and value chain dependencies exposed by Russia's invasion of Ukraine as a result.³⁶ These dependencies linked to materials that cause geopolitical tensions will only increase unless incremental policy shifts are put in place. The flip side of these trade flows is that some countries outside the EU commit almost their entire economy to serving the consumption patterns in high-income regions. For example, the textile industry makes up 90% of Bangladesh's total trade, with 56% of that destined for EU consumption.³⁷

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- 30 B. Oberle et al., "Global Resources Outlook 2019:Natural Resources for the Future We Want" (Nairobi, Kenya: International Resource Panel. United Nations Environment Programme, 2019), 69, <https://www.resourcepanel.org/reports/global-resources-outlook>.
- 31 Todd Moss and Vijaya Ramachandran, "Why the Climate Panic About Africa Is Wrong—Energy For Growth," December 6, 2021, <https://www.energyforgrowth.org/op-ed/why-the-climate-panic-about-africa-is-wrong/>; comparison based on EU data and benchmarks set out in Annex V of the Commission Regulation (EU) 2019/2019 on ecodesign requirements, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.315.01.0187.01.ENG&toc=OJ.L:2019:315:TOC.
- 32 European Commission, "EU position in world trade," accessed January 10, 2022, <https://ec.europa.eu/trade/policy/eu-position-in-world-trade/>.
- 33 WWF Europe, "EU Consumption Responsible for 16% of Tropical Deforestation Linked to International Trade," April 14, 2021, <https://www.wwf.eu/?2831941/EU-consumption-responsible-for-16-of-tropical-deforestation-linked-to-international-trade>.
- 34 Oberle et al., "Global Resources Outlook 2019:Natural Resources for the Future We Want," 96.
- 35 Leigh Mills, Colette van der Ven, and Christina Bodouroglou, *Sustainable Trade in Resources Global Material Flows, Circularity, and Trade*, (Nairobi, Kenya: UNEP and IRP, November 6, 2020), <https://www.resourcepanel.org/reports/sustainable-trade-resources>.
- 36 Morgan Bazilian, Simone Tagliapietra, and Georg Zachmann, "How to Wean Europe off Russian Gas as Swiftly as Possible," *Bruegel* (blog), March 14, 2022, <https://www.bruegel.org/2022/03/how-to-wean-europe-off-russian-gas-as-swiftly-as-possible/>.
- 37 Achim Berg et al., "What's next for Bangladesh's Garment Industry, after a Decade of Growth?," accessed January 17, 2022, <https://www.mckinsey.com/industries/retail/our-insights/whats-next-for-bangladeshs-garment-industry-after-a-decade-of-growth>; Mohammad Razzaque and Jillur Rahman, "Bangladesh's Apparel Exports to the EU: Adapting to Competitiveness Challenges Following Graduation from Least Developed Country Status," 2019.

FIGURE 3

Per capita impacts, by region of consumption, 2011



Source: International Resource Panel (2019), *Global Resources Outlook 2019 Summary for Policy Makers*³⁸

38 B. Oberle et al., *Global Resources Outlook 2019: Natural Resources for the Future We Want Summary for Policy Makers* (Nairobi, Kenya: International Resource Panel. United Nations Environment Programme, 2019), 21, <https://www.resourcepanel.org/reports/global-resources-outlook>.

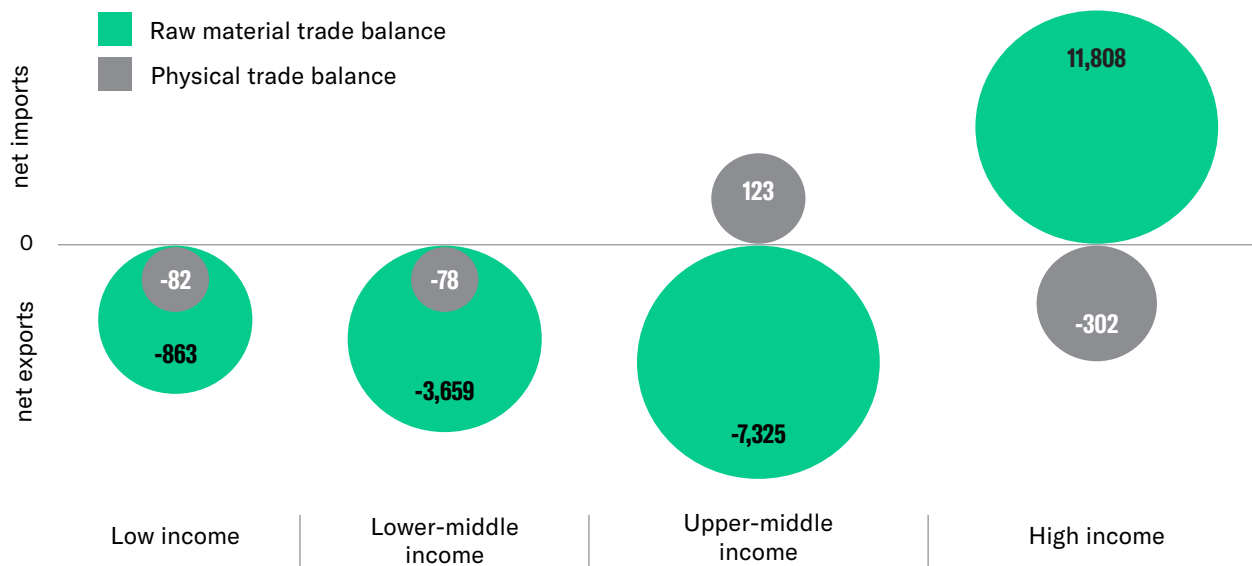
The international effects of a just and green transition in Europe must be managed carefully so as not to exacerbate international inequalities.

Given this context, phasing out fossil fuels in Europe and moving towards renewables, shifting towards localised circular supply chains, and reducing material consumption per capita would have significant consequences globally. In some cases, the EU leading the green and socially just transition at home may have adverse impacts on development in countries currently dependent on the EU within the global resource-driven system that has built up over centuries. For example, introducing mechanisms like the proposed Carbon

Border Adjustment Mechanism (CBAM), without accompanying transition support for third countries could drive entire industries and associated workers into poverty. The EU seems to be aware of short-term impacts of the green transition for international partners at least in specific cases: The EU links the security crises in Ukraine to Europe’s energy policy and uses this topic as leverage for geopolitical gains vis-à-vis Russia. However, the broader opportunity for positive, systemic shifts in governance structures and international relations is overlooked. After decades of European overconsumption that forced other countries into a race for cheap production, Europe must not turn its back on countries that fuelled its prosperity for so long.

FIGURE 4

Distribution of physical trade balance and raw material trade balance, in million tonnes, by country income, 2017



Source: International Resource Panel (2019), *Global Resources Outlook 2019 Summary for Policy Makers*³⁹

39 Oberle et al., 24.



If the EU wants to be a global leader it needs to walk the talk at home as well as abroad and consistently apply its EGD vision to its internal *and* external policies. It must acknowledge the potential global impacts of implementing a green and just transition at home. How can the EU break away from the historical self-serving extractive paradigm and redefine its relations with partners in a way that creates “*strong and sustainable links, not dependencies*”⁴⁰?

At the heart of this report’s argument lies a fundamental shift in thinking. If the EU aims at sustainable development globally, it needs to acknowledge that “retaining European competitiveness” and “ensuring a just transition globally” are contradictory terms unless new relationships are developed with third countries

to ensure transitional pathways on both sides and that apply different and more sustainable capital flows. The goal here is not decreasing reliance on others and retreating into “Fortress Europe” but to move away from a system of exploitation to a global model of shared responsibility and stewardship. While decarbonisation and dematerialisation help support the green and just transition, this reshaping of international relations and governance is fundamental in building long-term resilience and ensuring a green and socially just transition. This is not a story about what the EU needs to “give up” to successfully implement its green and social agenda. This is a story about how the global green and just transition will benefit the EU and the global community at large, from improved health and wellbeing to intact ecosystems and resilient relationships.

40 European Commission, “Global Gateway: Up to €300 Billion for the European Union’s Strategy to Boost Sustainable Links around the World,” December 1, 2021, https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6433.

Towards a Positive Vision for the Future

Until now, much of the (public and political) debate around the green and just transition has centred on reducing negative impacts, limiting harmful activities, and shifting behaviour away from unsustainable habits, like eating meat. The story of our green future is inevitably linked with loss or sacrifice, urgency, necessity, and the risk of inaction. Experiences of natural disasters, the lingering effects of a global pandemic or an active conflict raging along the eastern borders of the EU make the planetary emergency real to an increasingly large audience. Across the globe many people are experiencing the tangible impacts on human health, security, and wellbeing.

As we acknowledge the climate change emergency and its urgency, it is also crucial to simultaneously highlight the opportunity and possibilities for a radical transformation if decision-makers wish to bring people along on the journey. A narrative of hope is as much a part of system change as a narrative of fear. **The possible future in line with the suggested Compass transitions is about much more than just avoiding catastrophes.**

This future is marked by a much higher quality of daily life functions supported through well-functioning, accessible, clean, and healthy systems of mobility, housing, food, and everyday goods; by better communities and less loneliness; by free time to dedicate to creativity, movement, and relationships; by the convenience of reduced waste and pollution; and by better social cohesion and exchange, and reduced conflict.

In the long term, this requires a cultural shift that entails “learning new ways of being human”.⁴¹ In the short and medium term, this means shifting away from the accumulation of material possessions or growth as the primary means to increase (purported) wellbeing. Performance of our economic systems should be measured in terms of functionality and equal access to services rather than industrial production output or consumption of goods.

For example, instead of buying individual cars, citizens will pay into high-quality mobility systems of diverse and flexible shared transport options. Infrastructure can be developed to enable safe cycling and walking in smarter neighbourhood designs that bring essential services and jobs closer to where people live. In this vision, not only will individuals have to put less effort into the maintenance and removal of goods, but people will be less pressured to accumulate goods for an individual

41 The Club of Rome, *Learning New Ways of Becoming Human*, October 2020, <https://www.clubofrome.org/publication/learning-new-ways-of-becoming-human/>

sense of achievement. Instead, a sense of achievement can be generated on a community level, through, for example, access to mobility services or proximity to cultural spaces in multi-functional neighbourhoods. Simultaneously, citizens will enjoy a reduction in traffic accidents or air-pollution related health problems as well as better temperature moderation provided by nature and greenery replacing concrete roads and sealed lands.

European businesses can become a major economic engine providing for this **new quality of life**. Instead of measuring success in terms of volumes of outputs, enabled by as-cheap-as-possible production, the European economy will be determined by its contribution to systems functions and worker wellbeing. The EU's global leadership in economic, environmental, and social policy will be recognised as policies that enable system efficiencies and fair distribution along global value chains. Economic and diplomatic relationships will enable other countries to be partners, rather than suppliers of cheap production or export markets with linear consumption economies. European economic performance and progress will be measured in terms of wellbeing—including factors of global connections, social cohesion, reduced conflict, and shared resource security.

There are numerous examples of changes in society and the economy that seemed unrealistic or unthinkable before they became reality: The establishment of the War Production Board in 1942 facilitated the rapid industrial mobilisation and radical transformation of the US economy during the Second World War. Throughout the course of the war, 139 cars were manufactured in the US⁴²—in comparison to 3 million in 1941. Similarly, but more recently, during the early stages of the COVID pandemic, the governments of many member states swiftly adopted elaborate social security policies (e.g., income support and employment protection). The common denominator is an acute health or security threat that inspires a rapid transition—change in response to a creeping crisis like climate change is much more difficult to pinpoint. The various smoke-free regulations in the EU⁴³ are another example—today, it is difficult to imagine lighting a cigarette on an airplane, in an office, or in a restaurant.

The principles and recommendations in this report are an invitation to all readers to believe in an environmentally sustainable and socially just future and implement the changes required to bring this future about today.

42 David Vergun, "During WWII Industries Transitioned From Peacetime to Wartime Production," April 3, 2020, <https://www.doncio.navy.mil/chips/ArticleDetails.aspx?ID=13326>.

43 European Commission, "Smoke-Free Environments," accessed April 21, 2022, https://ec.europa.eu/health/tobacco/smoke-free-environments_en#status-on-the-various-smoke-free-regulations-in-the-eu.

Low-income countries with developing industries and infrastructure have a potential to leapfrog economic and societal models of industrial mass production, or linear mass consumption, with all its detrimental effects on the environment, climate, and wellbeing. These countries have less physical infrastructure and fewer vested interests in traditional, unsustainable socio-economic models.

Leapfrogging should not mean mimicking traditional development models. Outside of the constraints of the historical resource-intensive extractive paradigm, there is an opportunity to reshape industries to supply domestic mobility, housing, food, and consumer goods systems with circular modules, maintenance services, and “as a service” business models. Many lower-income countries have extensive circular, regenerative, and efficient systems (albeit often informal or not yet labelled as “circular”), for example mobility systems based on public transport and cycling, a stronger focus on plant-based (meaning inherently more resource-efficient) and regenerative food systems, or repair and remanufacturing practices. Such models can be formalised, optimised and must be “up-branded” as resource-smart, rather than viewed as “under-industrialised” or part of the informal economy. Most importantly, low-income countries need to have the freedom to evaluate, decide on, and implement their own transition pathways (on national, regional, or local levels). The key to all of this is the exchange of knowledge and technical knowhow between high- and low-income countries alongside the financial means required to grow a more green and social industrial foundation.

This report strives to kickstart an honest and critical conversation about what a green and socially just transition can mean for the future pathways of global partners as well as the position of the EU within the resource-intensive global system that it helped shape.

This report is broken down into the following chapters that address the challenges and opportunities of the European Green Deal:

- **Chapter 2** revisits the normative and analytical framework laid out by the *System Change Compass* in 2020 in the following ways:
 - Unpacks 10 Compass principles (key means to address the drivers and pressures of our economic system) needed to bring the successful systemic change in EGD implementation in the EU and in transitions made by other countries (**Chapter 2.1**).
 - Derives key policy recommendations (system-level orientations) from each of the 10 Compass principles to implement the EGD in a way that is beneficial for the EU as well as trade partners (**Chapter 2.2**).
- **Chapter 3** analyses the specific tensions and opportunities of a green and just transition for the EU’s trade relations in the Compass’ eight economic ecosystems: These economic ecosystems are based on four societal needs: nutrition, housing, mobility, and daily functional needs met through consumer goods (such as hygiene, clothing, or communication equipment). Four additional economic ecosystems support the first four ecosystems in their delivery of societal needs. These supporting economic ecosystems are



the energy, nature-based, circular materials, and information and processing ecosystems. Hence, the report analyses the EU's trade in the context of the built environment (housing), healthy food (nutrition), intermodal mobility, consumer goods (daily functional needs), energy, information and processing, circular materials, and nature.

- **Chapter 4** explores how the EU can leverage its role in international fora to drive the systems change that is needed to implement the EGD and

create a global governance system that is fair to all countries.

Overall, this report sets out the wider context of the international system change to sustainability that needs to happen if the EGD is to succeed. It explains the EU's responsibilities and its power to drive the transition on its own continent while supporting and empowering other regions to achieve their transitions as well.

2. GUIDING PRINCIPLES AND OVERARCHING POLICY ORIENTATIONS

As outlined in the introduction, resource efficiency and emission reductions alone will not get us to a sustainable 1.5°C future within planetary boundaries, for these measures do not guarantee a reduction in environmental pressures in absolute terms.⁴⁴ A holistic systems approach to governance and policymaking is needed to transform at the pace science requires.

In order to translate system change into concrete policy shifts and actionable recommendations to policymakers, the *International System Change Compass* wheel identifies 10 principles that underly the explicit and implicit assumptions about a fair, just, and sustainable future that the EGD vision builds on. The first section of this chapter, section 2.1. examines the current logic and dynamics behind each principle and puts forward an alternative

interpretation, or redefined approach, to each principle focusing on the international dimension and an external lens. These principles cover *what* is necessary to shift our economies, to redefine *what* we measure and value, and to determine *what* good leadership and governance look like in a society that effectively balances people, planet, and prosperity.

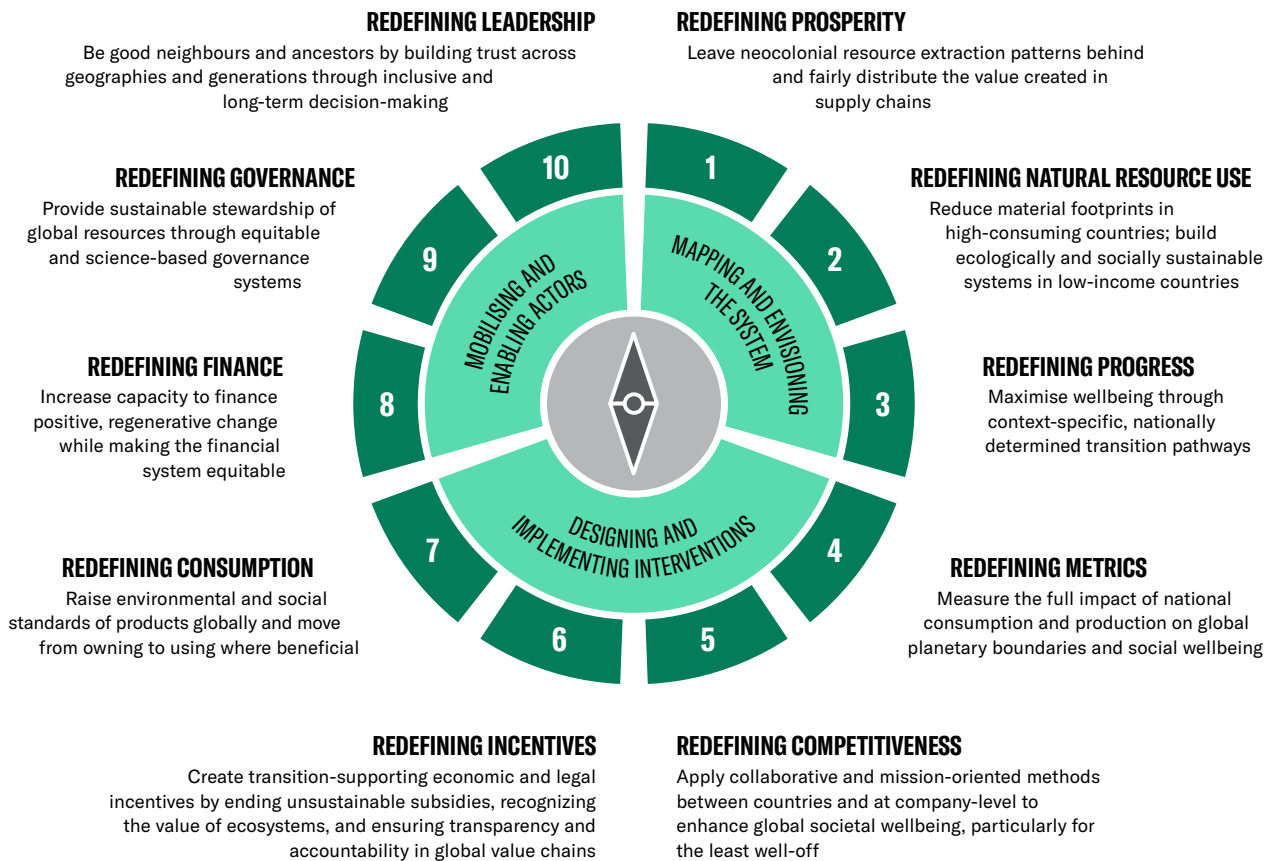
In doing so, the principles form the basis for specifying *how* the EU *can* move the needle on specific (eco)systems. This is laid out across 30 system-level orientations or ecosystem interventions that form the basis of the second part of this chapter, section 2.2. Taken together, the principles and system-level orientations help formulate a vision for the economy and infrastructure of tomorrow that the EU can promote at home as well as beyond its borders.

44 See also: European Environment Agency, *The European Environment State and Outlook 2020: Knowledge for Transition to a Sustainable Europe* (Luxembourg: Publications Office of the European Union, 2019), <https://www.eea.europa.eu/soer/publications/soer-2020>.

2.1 SYSTEM CHANGE PRINCIPLES FOR THE EUROPEAN UNION'S INTERNATIONAL COLLABORATION AND PARTNERSHIPS

FIGURE 5

System Change Compass—international lens



Mapping and envisioning the system: Principles 1-3

By redefining prosperity, resource use, and progress, the International *System Change Compass* (2022) lays the foundation for envisioning and redesigning an economic system compatible with a decarbonised, dematerialised, sustainable future—a system that nurtures the natural environment and strengthens human health and wellbeing for as many people as possible.

PRINCIPLE 1

Redefining prosperity—leave neocolonial resource extraction patterns behind and fairly distribute the value created in supply chains

Current paradigm and dynamics

Europe—like much of the rest of the world—has been marked by a widening economic gap between high-income and low-income regions since the financial crisis.⁴⁵ Globally, inequality between and within countries is driving political instability, conflict, involuntary migration, physical, and deteriorating mental health, all of which is slowing growth.⁴⁶ More than 1 billion people are at risk of being displaced by 2050 due to rapid population growth, shortages of food and water as well as increased exposure to natural disasters. Many of these people are seeking, or are likely to seek, refuge in Europe.⁴⁷ A society is only as strong as its most vulnerable link: Inequality is deeply damaging to even the most “prosperous”

segments of society for it decreases the overall resilience of our society. Kate Raworth’s doughnut model visualises social and planetary boundaries: Its inner-circle describes the social foundation, i.e., life’s essentials (from food and housing to health care and political voice),⁴⁸ and illustrates how COVID-19 has substantially increased our understanding of our shared experience.

Prosperity redefined

The central objective of “leaving no one behind” is poorly reflected in recovery instruments like NextGenerationEU or the Recovery and Resilience Facility (RRF), which prioritise kick-starting economic growth through short-term investments. Long-term resilience and prosperity for Europe requires tackling local and regional imbalances and ensuring fair socio-economic development for all—paying special attention to the regions, industries, and workers who will face the greatest challenges as outlined in the EGD. Access to quality jobs, essential services including nature, education and training programmes, and health care are crucial as well as factoring in generational impacts and the needs of future generations.⁴⁹ Social, labour, and environmental standards should first and foremost guarantee a shift towards more equity and wellbeing.⁵⁰ The realisation of this vision can only be implemented by shifting away from a continuous growth paradigm tied to GDP to a wellbeing economy that serves people, planet and prosperity in balance.

45 Thomas Blanchet, Lucas Chancel, and Amory Gethin, *How Unequal Is Europe? Evidence from Distributional National Accounts, 1980-2017* (World Inequality Lab, 2019), 29-32, <https://wid.world/document/bcg2019-full-paper/>; United Nations, Department of Economic and Social Affairs, *World Social Report 2020 - Inequality in a Rapidly Changing World* (New York, 2020), 22, <https://www.un.org/development/desa/dspd/world-social-report/2020-2.html>.

46 United Nations, Department of Economic and Social Affairs, *World Social Report 2020 - Inequality in a Rapidly Changing World*”, 45-50.

47 Alexandra Brzozowski, “Ecology Threats Likely to Send More Climate Refugees towards Europe by 2050,” September 9, 2021, <https://www.euractiv.com/section/global-europe/news/ecology-threats-likely-to-send-more-climate-refugees-towards-europe-by-2050/>.

48 Kate Raworth, “What on Earth Is the Doughnut?” April 28, 2013, <https://www.kateraworth.com/doughnut/>.

49 “Planetary Emergency 2.0 Securing a New Deal for People, Nature and Climate,” 8-9.

50 Sandrine Dixson-Declève, *Anchoring Transformation: Policy Anchors for Ensuring a New European Social-Economic Paradigm* (Switzerland: The Club of Rome, July 2021), 21-22, <https://www.clubofrome.org/publication/anchoring-transformation-policy-anchors-for-ensuring-a-new-european-social-economic-paradigm/>.

Fair socio-economic development for all does not stop at the borders of the EU. Much like the regional imbalances within the EU inhibit true prosperity for Europe, so does regional inequality globally. Putting distributional impacts at the centre would allow us to move away from an individual conception of prosperity towards an understanding of prosperity as a collective good. By putting equity, inclusion, and just criteria at the centre of its external policy frameworks, the EU will enhance global resilience and therewith European resilience to future shocks and stresses. The EU has much to gain from its Comprehensive Strategy with Africa, which strives to unlock Africa's potential for a green and circular economy and can serve as a case study for social-economic cooperation and development that prioritises optimising wellbeing for all.⁵¹

Ultimately, redefining prosperity means moving away from extractive or exploitation patterns and post-colonial dependency relationships, towards a more balanced and equitable relationship. Implementing this means shifting from development aid and relationships of power to collaborative partnerships (matching the recent name change of DG Development Cooperation (DG DEVCO) to DG International Partnerships (DG INTPA)). It means radical shifts in international trade and investment practices as well as fiscal policies—see principles 4-7 and system-level orientations.

PRINCIPLE 2

Redefining natural resource use—reduce material footprints in high-consuming countries; build ecologically and socially sustainable systems in low-income countries.

Current paradigm and dynamics

Global extraction of natural resource materials is growing fast, having tripled between 1970 and 2017,⁵² and there is no sign of reversing this trend through technological efficiency. In contrast, global material productivity of income per tonne of extracted material has been declining or stagnating since the year 2000.⁵³ This has disastrous consequences for local and global wellbeing, contributing to 90% of global biodiversity loss and water stress, 50% of global GHG emissions, and 30% of global air pollution health impacts.⁵⁴ The per capita material footprint in high-income countries (HIC) is 13 times as high as in low-income countries (LIC), and the material import dependence of HIC has risen by over 1% every year of the last 20 years.⁵⁵ Although global science has not yet been able to define targets or levels for sustainable production and consumption of different resources, science is very clear about the need to reduce material consumption, and particularly virgin material consumption, at significant scale—possibly by a factor of 2 to 10 in HIC.⁵⁶

51 “The European Green Deal,” 19.

52 Oberle et al., *Global Resources Outlook 2019:Natural Resources for the Future We Want*,” 27.

53 Oberle et al., 39.

54 Oberle et al., 65.

55 United Nations Statistics Division, “SDG Indicators,” accessed November 30, 2021, <https://unstats.un.org/sdgs/report/2019/goal-12/>; Oberle et al., *Global Resources Outlook 2019:Natural Resources for the Future We Want*, 52.

56 Mark Swilling et al., *The Weight of Cities: Resource Requirements of Future Urbanization* (International Resource Panel. United Nations Environment Programme, 2018), 69-70, <https://www.resourcepanel.org/reports/weight-cities>.

In the past, improvement efforts in material productivity have mainly focused on the supply side, meaning the industrial production and manufacturing of materials into goods. However, with growing population and fast closing natural sinks for the emissions of material consumption, such marginal efficiency improvements will not be enough. Even by supplying industrial production (where most of material related GHG emissions come from) with cleaner energy, the improvements in emissions will not be fast enough, and without a reduction in demand, the consequences of such clean energy technology will have a disastrous effect on conflicts over rare metals, and biodiversity impacts of mining.

Natural resource use redefined

The *International System Change Compass* calls for a more fundamental realignment of the relationship between income levels and resource consumption, where increasing the former is decoupled from the latter. Resource decoupling has different implications for developed and transitioning economies. In high consuming countries, the required reduction in material footprint can be achieved by redesigning and transitioning economic provisioning systems to a more optimised way of delivering services (see principle 3), using materials in a fully circular way, and focusing rapid developments in digitalisation and smart technologies on enabling these transitions. In LIC that need to raise average prosperity levels and still ensure access to fundamental wellbeing functions (and therefore expand the footprint), the goal is to build systems—like clean water or public infrastructure—with the global green and just transition in mind. such as investing in smarter urban forms and public transport rather than sprawled living and private vehicles (see Chapter 3.9: Recommendations for economic ecosystems,).

This redefinition requires a new conception of a right to access of virgin natural resources. With limited natural resources, it is crucial that countries that lack infrastructure have priority access, and do not base their economic models on exporting materials that will then become too scarce to support systems at home. To expand on its green deal diplomacy, the EU could play a leading role in the creation of new governance arrangements stewarding global resource use, as outlined below in principle 9.

Another crucial puzzle to solve is how countries that rely on the export of raw materials or mass material goods for their income can transition to more material-independent sources of income in international currency. Principle 8 on redefining finance outlines the potential of including nature in accounting systems and on balance sheets, in line with the recommendations from the Dasgupta review.⁵⁷ European financial institutions like the European Investment Bank could play a leading role in stimulating new models of cooperation within value chains and innovation that would enable exporting and importing countries to support each other in the transition to a dematerialised and decarbonised value chain.

These shifts would imply a deep change in global trade flows: Major import and/or export hubs, like the EU, must transition from trading and shipping goods and materials towards enabling the reuse and repair of products and modules, or even dematerialise and decarbonise more fundamentally to trade intelligence and services; a field where more research and more visionary scenario modelling analysis is needed.

57 Partha Dasgupta, *The Economics of Biodiversity: The Dasgupta Review* (London: HM Treasury, 2021), www.gov.uk/official-documents.

PRINCIPLE 3**Redefining progress—maximise wellbeing through context-specific, nationally determined transition pathways.*****Current paradigm and dynamics***

Our current economic system optimises consumption, revenue, and shareholder value with little regard to social and environmental impacts, as outlined under principle 1. Economic progress is mostly defined by the mass output of economic sectors, driven by a focus on maximising production. Regulation and investment often focus on marginally improving an old production and consumption model (such as mass vehicle production) rather than embracing completely new production and service models that deliver a societal function (such as mobility). These models require fewer resource inputs and create new types of service, maintenance, and remanufacturing focused jobs.

Progress redefined

This redefinition is about a new logic of structuring and steering economic activity, so that it enables a deep dematerialisation and decarbonisation as explained in principle 2. Economic activity is not the goal but serves to fulfil the functional needs of society and service people-planet-prosperity, maximising wellbeing through context-specific, nationally determined transition pathways.

Applying the *System Change Compass* logic, economic policymaking and business planning should aim to provide functional services to fulfil societal needs without transgressing planetary boundaries. To do this, it is necessary to better understand the essential societal needs that, taken together, account for more than 80% of energy use in Europe, as well as the largest share of European material footprint:⁵⁸

1. Nutrition: Access to drinkable water and healthy, nutritious food.
2. Housing: Access to a safe, sanitised, heated, or cooled shelter.
3. Mobility: Access to safe transport from one place to another, to work, to school, or to interact socially; this also includes safe transport for goods along their value chains.
4. Daily functional needs: Access to day-to-day consumer goods and services (e.g., clothes, household and personal hygiene, communications).

Four additional economic ecosystems enable the directly needs-based systems to function: Energy, information and processing, circular materials and their remanufacturing/reuse infrastructure, and nature, including ecosystem services and nature-based solutions to climate mitigation and adaptation. Chapter 3 describes the implications of the transition in these eight economic ecosystems.

58 The System Change Compass focusses on societal needs that require natural resources to be fulfilled. Hence, it leaves out societal needs that—while equally important for people—do not directly require natural resources to be fulfilled, such as education, gender equality, or political expression. As a result, this list of societal needs is not a comprehensive definition of what makes life worthwhile. It does, however, provide a framework to focus policy interventions on one of the most pressing social and environmental shortcomings in today's system: the unsustainable use of natural resources.

Placing a Value on Nature

Major biodiversity loss and ecosystem collapse is one of the top 5 threats humanity will face in the next 10 years, as set out by the World Economic Forum Global Risks Report.⁵⁹ Economic wellbeing and nature are intrinsically interconnected—with more than a third of humanity directly depending on nature for their livelihoods. Importantly, nature can be a powerful ally in the fight against climate change, and in the transition towards a net-zero economy.⁶⁰ For example, restoring and protecting nature can help us achieve one third of the carbon emission reductions needed for the Paris Agreement goals (by 2030 and within two degrees). In protecting nature, we protect human health and prosperity.

Still, nature is often undervalued or not valued at all. Importantly, in today's market economy the only way we can "value nature" is by assigning nature (e.g., water and forests) monetary value: Natural capital. While providing a valuable short-term lever for the protection of nature within the current system, conversations around nature markets⁶¹ and accounting also carry a risk of further engraining the unsustainable relationship between nature and economy. After all, it perpetuates the idea that in our society everything of value must be measured by its monetary or economic worth. Ultimately, the only way to truly address the historical imbalance is through a radical departure from traditional monetary growth indicators towards a system that allows societies to value nature for all that it offers, without needing to equate "value" with a single measurable metric—like carbon emissions or offsets.

Based on this logic, economic policymaking would aim to optimise each economic ecosystem and its value chains (i.e., within the enabling ecosystems) to deliver functions to society and minimal virgin resource inputs and clean processes, incentivising "as a service" business models that sell a long-term function instead of products. The metric of progress would no longer be productivity of output, but productivity of people served by the system with minimal and clean/circular inputs, for example people transported at minimal commutes, people healthily fed, and people housed at high-quality (see principle 4).

In the international context of global value chains, there are some extra challenges to master across countries. The location of production, for example of a vehicle, and the location of use in a mobility system are often in different countries. When a system stretches across jurisdictions, progress should be measured as the sum of optimised functionality and resource efficiency across the value chain. Optimisation of the mobility functionality in Germany would have consequences for the United States as the largest importer of German vehicles and vice versa.

59 World Economic Forum, *The Global Risks Report 2021*, January 19, 2021, <https://www.weforum.org/reports/the-global-risks-report-2021>.

60 Finance for Biodiversity Initiative (F4B), *The Future of Nature Markets*, April 2022, https://www.f4b-initiative.net/_files/ugd/643e850ffa4837930e4c928683f8b58601bf39.pdf.

61 Frans Timmermans, Achim Steiner, and Sandrine Dixson-Declève, "Net Zero Is Not Enough – We Need to Build a Nature-Positive Future," *The Guardian*, October 28, 2021, sec. Environment, <https://www.theguardian.com/environment/2021/oct/28/net-zero-is-not-enough-we-need-to-build-a-nature-positive-future-aoe>.

Designing and implementing interventions: Principles 4-7

Redefining the way to measure, value, and evaluate economic progress or success will help design and implement the economic system of the future as outlined in principles 1-3. How to place a value on things that matter—especially when they are difficult to quantify and measure? How to ensure accountability and monitor progress towards a green and socially just transition? These are the questions principles 4-7 seek to address.

PRINCIPLE 4

Redefining metrics—measure the full impact of national consumption and production on global planetary boundaries and social wellbeing.

Current paradigm and dynamics

Since the Second World War, growth in monetary terms is the key indicator in the public as well as the private sector. Gross domestic product (GDP) is used by almost all countries worldwide as the single indicator for growth and as the basis for political decision-making.⁶² Scholars have warned for years

that this traditional and narrow focus on GDP growth leads us to ignore other important criteria for our wellbeing and societal progress, and has in fact contributed to growing inequality and health issues like depression.⁶³ By counting only what can be expressed in monetary value, GDP and its associated economic model simultaneously overvalue and over-rewards production (financial) capital while undervaluing and under-rewarding natural or human capital. Not unimportantly, GDP growth perpetuates a neo-liberal global value-system rooted in historical dependencies, regional imbalances, and domination.

Recognising these shortcomings, some countries have begun to complement GDP-based metrics with measuring wellbeing and social indicators of progress.^{64, 65, 66}

Redefining metrics

An economy consistent with the SDGs and the ambitions set in the EGD needs to be guided by this more holistic dashboard of indicators.⁶⁷ Doing so would also support decoupling from natural resources as well as monitoring social and environmental impact.

62 Tim Callen, "Gross Domestic Product: An Economy's All," Finance & Development, February 24, 2020, <https://www.imf.org/external/pubs/ft/fandd/basics/gdp.htm>; World Bank, "GDP per Capita Growth (Annual %)," accessed November 30, 2021, <https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG?view=chart>.

63 See also the work on the Human Development Index and the Human Development Reports published yearly since 1990: <https://hdr.undp.org/en/global-reports>; OECD, *The Economy of Well-Being: Creating Opportunities for People's Well-Being and Economic Growth*, 2020, [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=SDD/DOC\(2019\)2&docLanguage=En](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=SDD/DOC(2019)2&docLanguage=En); World Wide Fund for Nature, *Towards an EU Wellbeing Economy: A Fairer, More Sustainable Europe After COVID-19* (Brussels, 2020), <https://www.wwf.eu/?874941/The-Wellbeing-Economy-Time-to-move-Europe-beyond-GDP>.

64 World Wide Fund for Nature, *Towards an EU Wellbeing Economy: A Fairer, More Sustainable Europe After COVID-19*.

65 For example, in 2019, the Prime Minister's Committee on measurements for wellbeing in Iceland proposed a framework of 39 indicators that cover social, economic, and environmental dimensions of quality of life—such as life expectancy, level of education or trust in political system, Government of Iceland, Prime Minister's Office, *Indicators for Measuring Well-Being*, 2019, <https://www.government.is/lisalib/getfile.aspx?itemid=fc981010-da09-11e9-944d-005056bc4d74>.

66 Another example is counting natural capital and its development overtime, a measure applied by countries like Costa Rica and the Philippines, supported by the United Nations System of Environmental Economic Accounting United Nations, "System of Environmental Economic Accounting," accessed December 6, 2021, <https://seea.un.org/content/global-assessment-environmental-economic-accounting>.

67 Sandrine Dixson-Declève and Aileen McLeod, "21st Century Wellbeing Economics: The Road to Recovery, Renewal & Resilience," Volume 1 *Europe: The Club of Rome Economic Recovery, Renewal & Resilience Series* (Switzerland: The Club of Rome, February 2021), 9, <https://www.clubofrome.org/publication/21st-century-wellbeing-economics-the-road-to-recovery-renewal-resilience/>.

With the creation of Resilience Dashboards, the EU has taken a first step towards measuring people's wellbeing beyond GDP and integrating alternative indicators into policymaking. Outside of the EU, policymakers could take inspiration from initiatives like the Wellbeing Economy Governments partnership (WEGo) and the Living Standards Framework New Zealand has put in place or explore new economic models like the Doughnut economy model.⁶⁸

In the short term, the introduction of alternative indicators like human or natural capital encourages optimisation within the current system and can shift the way economic performance and systems productivity are measured—if implemented properly across the economy. The OECD wellbeing framework or the principles put forward by the Wellbeing Economy Alliance⁶⁹ are examples of the integration of holistic sets of wellbeing indicators. In the long-term, we need to shift how we measure performance of the economy and productivity of our systems entirely, if we wish to move away from the GDP and growth-based accounting that is so firmly ingrained into global decision-making structures.

International collaboration is key to ensure that learnings around measuring growth and productivity are shared—to avoid transitioning economies mimicking harmful development pathways that clash with a green and just vision of the future. To that end, existing fora like WEGo partnership⁷⁰ should be leveraged by EU policymakers for sharing of expertise, learning, and co-creation of alternative metrics and policy solutions. Moreover, it is crucial to determine which implications and effects a shift towards a holistic measurement will have for existing governance structures within national states as well as international structures like the World Bank or G7/G20. It will be important to understand how these

organisations can incorporate new metrics in their structures and work, as outlined under principle 9 (redefining governance) and in Chapter 4 of this report.

PRINCIPLE 5

Redefining competitiveness—apply collaborative and mission-oriented methods between countries and at company-level to enhance global societal wellbeing, particularly for the least well-off.

Current paradigm and dynamics

Competition and competitiveness—for both companies and nations—continues to be understood mainly as a race to lowest prices and to growth as the main measure of success.

For companies, competitiveness means the ability to generate high levels of profits in the short-term applying economies of scale and striving for mass production. In the last decades, competition is characterised mainly by a “race to the bottom.” The introduction of free market mechanisms (brought to LIC mainly via the World Bank, International Monetary Fund, and the World Trade Organisation), left companies with the possibility to scan the globe in search for the lowest regulatory limits as well as cheapest labour—often going hand in hand with low social and environmental standards—to maximise their profit. This created a dynamic in which LIC compete to drive standards and wages down to attract foreign corporations and investment, with the goal of supplying higher-income regions with resources at the lowest possible prices.⁷¹ In this paradigm, the effects of competition are primarily to lower cost, by putting pressure on wages and social and environmental standards, to supply low-price, high-waste, mass consumption in

68 The New Zealand Department of Treasury, “Our Living Standards Framework,” accessed March 23, 2022, <https://www.treasury.govt.nz/information-and-services/nz-economy/higher-living-standards/our-living-standards-framework>.

69 OECD, “Measuring Well-Being and Progress: Well-Being Research,” accessed January 10, 2022, <https://www.oecd.org/wise/measuring-well-being-and-progress.htm>.

70 WEGo, “Wellbeing Economy Alliance,” accessed November 30, 2021, <https://weall.org/wego>.

71 Jason Hickel, *The Divide* (London: Penguin Random House, 2018), 170.

Co-opetition

This a concept brought forward by Adam M. Brandenburger and Barry J. Nalebuff in 1997 in their book *Co-opetition*. Co-opetition is introduced as a business strategy that combines the advantages of competition and cooperation. This concept can be transferred as means for facilitating the green and socially just transition.

There are many examples of successful co-opetition. One of the most important ones during the COVID-19 pandemic is the cooperation between Pfizer and BioNTech to accelerate global development of a vaccine, leveraging the expertise and resources of both companies. This was also a public-private partnership as the two companies received EUR 475 million in public funding (EUR 375 from the German government and EUR 100 million from the European Investment Bank).^{72, 73}

However, this co-opetition did not advance global equity: Pfizer and BioNTech have delivered less than 1% of their total vaccine supplies to LIC.⁷⁴ As of 30 January 30, 2022, more than 3 billion people around the world were still waiting to receive their first COVID-19 vaccine dose. Only 13% of people in LIC have received at least one vaccination dose, in high-and upper-middle-income countries, 79% of the population has received at least one dose (numbers refer to February 2022).⁷⁵ Despite receiving public funding and Pfizer having nearly USD 37 billion in sales in 2021,⁷⁶ the corporation so far has ignored calls asking for urgent transfer of vaccine technology and know-how to producers in low- and middle-income countries via the World Health Organisation (WHO)⁷⁷—a move that could increase global supply, drive down prices, and save millions of lives.

Successful co-opetition is not only mission-aligned with the green transition, but also enhances equity within and across borders in line with the just transition.

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- 72 BioNTech SE, "BioNTech to Receive up to €375M in Funding from German Federal Ministry of Education and Research to Support COVID-19 Vaccine Program BNT162", September 15, 2020, <https://www.globenewswire.com/news-release/2020/09/15/2093535/0/en/BioNTech-to-Receive-up-to-375M-in-Funding-from-German-Federal-Ministry-of-Education-and-Research-to-Support-COVID-19-Vaccine-Program-BNT162.html>
- 73 European Investment Bank, "Germany: Investment Plan for Europe - EIB to provide BioNTech with up to €100 million in debt financing for COVID-19 vaccine development and manufacturing", June 11, 2020, <https://www.eib.org/en/press/all/2020-144-eib-to-provide-biontech-with-up-to-eur-100-million-in-debt-financing-for-covid-19-vaccine-development-and-manufacturing>
- 74 Oxfam, "Pfizer, BioNTech and Moderna making \$1,000 profit every second while world's poorest countries remain largely unvaccinated", November 16, 2021, <https://reliefweb.int/report/world/pfizer-biontech-and-moderna-making-1000-profit-every-second-while-world-s-poorest>.
- 75 Our World in Data, "Coronavirus (COVID-19) Vaccinations", <https://ourworldindata.org/covid-vaccinations>, accessed February 26, 2022.
- 76 Julia Kollewe, "Pfizer accused of pandemic profiteering as profits double", February 8, 2022, <https://www.theguardian.com/business/2022/feb/08/pfizer-covid-vaccine-pill-profits-sale>
- 77 Amy Maxmen, "The fight to manufacture COVID vaccines in lower-income countries", September 15, 2021, <https://www.nature.com/articles/d41586-021-02383-z>

high-income regions. Competition typically foregoes any consideration for human and planetary health impacts and induces natural resource depletion as well as social costs.

For nation states, competition is framed in the ability to attract investments, increase production and exports to sustain high levels of GDP growth. In Europe and most of other regions with high-income countries (HIC), the predominant economic model is one of a resource-heavy and high-polluting economy. In this model, 50% of materials end up in landfills, where 95% of the value of material and energy inputs are lost after the first product life cycle.⁷⁸ There are unequal conditions of competition between countries: Economies of HIC developed high standards of wages, living conditions and industries by protecting their markets, while benefiting from natural resources in third countries and often through exploitative colonial relationships.⁷⁹ LIC are more limited in the instruments they can use to determine fair prices and support national industries, e.g., via WTO regulation or bilateral trade agreements. This dynamic will never lead to a “level playing field”—one of the key purposes of the WTO⁸⁰—as the players are in very different leagues.

Current models of “competitiveness” based on cheap prices for natural resources and basic industrial production are not only unfair and environmentally harmful, but they also underrate the massive vulnerability for importing countries. For many major raw materials, such as aluminium, cobalt, lithium or iron, the EU is heavily dependent on imports,⁸¹ of which prices and supply are increasingly volatile and not guaranteed.⁸²

Competition redefined

In the face of climate change, biodiversity collapse, and global health crises, the global community are weathering a similar storm—but not in the same boat. Experience, perception, and needs may differ starkly between countries and regions, as COVID-19 has made clear. A “level playing field” cannot be reached within the current system. Redefining competitiveness is necessary to create a global partnership model that enhances greater economic stability and wealth distribution.⁸³ To this end, relations between businesses and with governments need to radically transform to catalyse a new industrial revolution⁸⁴ that is driven by innovation for sustainable and equitable solutions. Experimental methods and “mission-oriented thinking” are key.⁸⁵

78 Eurostat, “Waste Statistics,” Eurostat, April 2021, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_statistics; MacArthur, E., M. R. Stuchtey, and K. Zumwinkel, *Growth Within: A Circular Economy Vision for a Competitive Europe* (Ellen MacArthur Foundation, 2015), <https://emf.thirdlight.com/link/8izw1qhml4ga-404tsz/@/preview/1?o>.

79 Jason Hickel, *The Divide*.

80 World Trade Organisation, “What Is the WTO?,” accessed February 28, 2022, https://www.wto.org/english/thewto_e/whatis_e/wto_dg_stat_e.htm.

81 Eurostat, “EU Self-Sufficiency for Raw Materials,” accessed December 21, 2021, https://ec.europa.eu/eurostat/databrowser/view/cei_pc010/default/table?lang=en.

82 ifo Institute, “Shortage of Materials in Germany Worsens,” February 28, 2022, <https://www.ifo.de/en/node/68199>.

83 Assuming limited corruption and governance models that focus on servicing people and planet as well as economic prosperity (see principles 9 and 10).

84 Maija Breque, Lars De Nul, and Athanasios Petridis, “Industry 5.0: Towards a Sustainable, Human Centric and Resilient European Industry” (Luxembourg: Directorate-General for Research and Innovation, 2021), 25-26, https://ec.europa.eu/info/publications/industry-50_en.

85 For a deeper analysis, see Mariana Mazzucato, *Mission Economy—A Moonshot Guide to Changing Capitalism* (London: Penguin Random House, 2022).

On a company level, competitive forces need to be redirected through policy and regulation. On a government level, policymakers must better learn how to efficiently shape and create markets—making things happen that otherwise would not in socio-economic systems based on zero-sum, growth-driven competition.⁸⁶ For example, regulatory policies should foster “co-opetition”: A mixture of competition and true cooperation between competitors (horizontal) and along value chains (vertical) with the underlying goals of social equity within planetary boundaries. Similarly, concepts such as intellectual property need to be applied first as means of deploying knowledge and technology in a way that enables the scaling of sustainable solutions quickly rather than a means of generating profit.

To build sustainable, needs-meeting economies, the prevailing definition of competition in relation to price/cost competitiveness and GDP-growth must be overcome. Social investments, ecological ambitions, and efforts to internalise social and environmental cost should become the main drivers of competition.⁸⁷ Instead of competition between countries over natural resources and raw materials—even in the name of the green transition,⁸⁸ a global effort is necessary to ensure a just distribution of such resources as well as fair compensation for the supplying countries.⁸⁹ Following such redefinition, competitiveness could become a metric of progress in monitoring the shift to a more dynamic, socially inclusive and ecologically ambitious path.⁹⁰

PRINCIPLE 6

Redefining incentives—create transition-supporting economic and legal incentives by ending unsustainable subsidies, recognizing the value of ecosystems, and ensuring transparency and accountability in global value chains.

Current paradigm and dynamics

The current incentive framework underpinning the global economy places a perverse market value on economic activities that do not foster environmental or human protection, and, on the other hand, do not account for negative externalities. Where incentives exist, their purpose is most often to stimulate an increase in economic activity to promote growth in GDP and short-term profits that come at immense cost (see principle 4). Recent analysis shows that Europe’s consumption-based footprint exceeds planetary boundaries, if trade flows between regions and countries in today’s globalised economy are considered.⁹¹ Market-based, as well as regulatory instruments, fall short on recognising the value of ecosystems. Instead, they frequently strengthen lock-ins to polluting industries and harmful dependencies between nations. Examples include:

- Worldwide subsidies to the aviation industry during the COVID-19 pandemic. These totalled almost USD100 billion by September 2020, and they are especially notable given the failure to strengthen more sustainable forms of transport.⁹²

86 Mariana Mazzucato, *The Entrepreneurial State—Debunking Public vs. Private Sector Myths* (London: Penguin Random House, 2018), 209.

87 See also: Karl Aiginger and Matthias Firgo, “Regional Competitiveness Under New Perspectives,” *SSRN Electronic Journal*, 2015, 1: <https://doi.org/10.2139/ssrn.2685585>.

88 The European industrial strategy focusses on securing e.g., raw material for the EU rather than working towards a just distribution with a fair compensation for LIC, European Commission, “In-Depth Reviews of Strategic Areas for Europe’s Interests,” accessed March 9, 2022, https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy/depth-reviews-strategic-areas-europes-interests_en#raw-materials.

89 Eurostat, “EU Self-Sufficiency for Raw Materials.”

90 Karl Aiginger, Susanne Bärenthaler-Sieber, and Johanna Vogel, “Competitiveness Under New Perspectives,” 2015, 1, <https://doi.org/10.13140/RG.2.1.1003.1525>.

91 European Environment Agency and Federal Office for the Environment FOEN, *Is Europe Living within the Limits of Our Planet? An Assessment of Europe’s Environmental Footprints in Relation to Planetary Boundaries* (Luxembourg, 2020), 9, <https://data.europa.eu/doi/10.2800/890673>.

92 Statista, “Government Aid to Airlines in Europe COVID-19,” *Statista*, accessed March 17, 2022, <https://www.statista.com/statistics/1189278/government-aid-airline-europe-covid/>.

- The short-sighted reaction to the Russian invasion of Ukraine, which has largely involved a change in preferred fossil fuel suppliers (mainly gas)⁹³ rather than efforts to more quickly move to an economy based on true regenerative energy (not “renewable gas” but rather solar and wind power).

Incentives redefined

To support the shift towards a green and just future, incentives need to be fully aligned with environmental and social objectives. As a first step, this means halting all subsidies for harmful and unsustainable economic activities to shorten the economic life of industries that drastically accelerate the encroachment on planetary boundaries—including fossil energy and industrial agriculture. A mixture of market-based instruments (e.g., carbon pricing, producer ownership schemes and regulatory approaches such as a ban on specific harmful substances/actions) can be used to shift from an incentive model based on perverse subsidies to a focus on positive incentives that accelerate the green transition while also supporting the just transition.

Additionally, in redefining incentives, greater emphasis should be placed on ecosystem services. International agreements on common standards and methods of measuring such services would empower countries on whose territory ecosystem services are created to capture the value from them. As one of the largest importers of tropical deforestation and associated emissions,⁹⁴ the EU should work directly with third countries who have vast tropical forests to facilitate a shift towards deforestation free agricultural commodities. Designing and implementing equitable compensation mechanisms is key to enabling a global moratorium on deforestation and ensuring a just transition. For learning purposes, there are already hundreds

of “Payment for Ecosystem Services” programmes around the world, that differ based on the actors that finance the programmes (e.g., users of ecosystems or governments) as well as the ecosystem services they cover (e.g., water, biodiversity and habitat, forest and land-use carbon) that can be learnt from.⁹⁵

Finally, the EU should use its strong position in international trade relationships to increase transparency around the social and environmental impacts in global value chains. Globally applicable and standardised certificates for products and services that reflect the impact on planetary boundaries need to be introduced. Products need to be given a price that is in proportion to the damage caused—i.e., costing of externalities, whether in the form of a global “polluter pays principle” (where the polluter needs to be defined thoughtfully in line with equity and fairness principles), carbon pricing, natural capital accounting or a combination of all the tools in the toolbox. Internalising externalities and the behavioural change that it inspires may however not lead to an increase social inequality. Offering sustainable and affordable alternatives is key. When it comes to ensuring transparency and accountability, there is no shortage of solutions or policy tools, but rather a lack of political will and inclination from incumbents to adopt better practices.

PRINCIPLE 7

Redefining consumption-raise environmental and social standards of products globally and move from owning to using where beneficial.

Current paradigm and dynamic

Our “throwaway society” produces 2.01 billion tonnes of municipal solid waste every year⁹⁶ and exploits resources at a level that if not

93 European Commission, “REPowerEU: Joint European Action for More Affordable, Secure and Sustainable Energy,” *European Commission*, accessed March 17, 2022, https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1511.

94 WWF Europe, “EU Consumption Responsible for 16% of Tropical Deforestation Linked to International Trade.”

95 James Salzman et al., “The Global Status and Trends of Payments for Ecosystem Services,” *Nature Sustainability* 1, no. 3 (March 2018): 136–44, <https://doi.org/10.1038/s41893-018-0033-0>.

96 Silpa Kaza et al., *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050* (Washington, DC: World Bank, 2018), 3, <https://openknowledge.worldbank.org/handle/10986/30317>.

changed will lead a climate catastrophe and mass extinction.⁹⁷ This unfortunately marks the dominant understanding of consumption and ownership. In Western society, consumption is strongly linked to prosperity: The more we produce and then consume, the better for our economy and for us as individuals. Looking at the social and ecological processes and effects, there is a tremendous North–South divide: The existing carbon offset mechanisms attempt to compensate for the CO₂ footprint associated with HIC’s consumption (e.g., through purchases of hectares of carbon-absorbing rainforest), but do not usually factor in the environmental and social costs of production in LIC.⁹⁸

Consumption redefined

According to the System Change Compass, changing beliefs and shifting behaviour towards a lifestyle that incorporates a measure of sufficiency, requires an integrated set of measures that touch on both the demand side as well as the supply side of the economy. Immediate measures need to be implemented that “nudge” consumers to *use* products rather than own them: Products should be available for rent (“products as a service”⁹⁹) as well as for purchase, with the rent option as a default and making the buy-to-own option less attractive, for example, through a simple registration process. The most important tools to support this shift are education and access to information. Informing citizens about their role and power as consumers as well as the potential impacts of consumption is crucial for creating active consumer engagement and shifting consumption patterns.

In an international context, recognising regional imbalances and implementing measures that address them, for example by ensuring resource efficiency per consumer function and analysing if consumption should be linked to regional resource availability, is key. Science-based minimum social

and environmental standards for products (i.e., also imports to the EU) should be implemented while unpacking the problem on how consequential, detrimental (economic) effects for lower-income countries can be remedied.

In addition to shifting the way of consuming and optimising efficiency, EU policymakers should not shy away from discussions around sufficiency and current consumption levels. Redistributing responsibility for end-of-use materials and products and therewith redressing outsourced environmental impacts is crucial to ensuring the success of the EGD. To this end, the EU could, for example, apply a maximum consumer footprint per capita or an “over-consumption” budget to minimise impacts of European consumption.

Mobilising and enabling actors: Principles 8–10

Where previous sections examined the vision for the economic system of the future and potential interventions that would enable the transition towards such a system, these last three principles zoom in on the actors that can shape this transition and make it a reality. How can stakeholders be empowered to implement change in their spheres of influence? What do transformational leadership and good governance look like in a true net-zero society?

PRINCIPLE 8

Redefining finance-increase capacity to finance positive, regenerative change while making the financial system equitable.

Current paradigm and dynamics

Capital markets and the financial sector are not set up to support a global transition towards a sustainable economy. According to IRENA, USD31 trillion would need to be invested by 2050 to keep energy-industry

97 Oberle et al., *Global Resources Outlook 2019: Natural Resources for the Future We Want*, 27.

98 Elizabeth Reichart and Deborah Drew, “By the Numbers: The Economic, Social and Environmental Impacts of ‘Fast Fashion,’” January 10, 2019, <https://www.wri.org/insights/numbers-economic-social-and-environmental-impacts-fast-fashion>.

99 SYSTEMIQ, *Everything- as-a-Service XaaS. How Businesses Can Thrive in the Age of Climate Change and Digitalization* (Munich: SYSTEMIQ, 2021), <https://www.systemiq.earth/xaas/>.

related emissions in line with a 1.5°C scenario.¹⁰⁰ The funds would in principle be available: According to the Allianz Global Wealth Report, global gross financial assets topped USD200 trillion in 2020.¹⁰¹ The focus on financing change or in particular allocating capital to low carbon technology currently misses the deeper inequalities embedded in the current financial system, which does not factor in environmental or social externalities. Our financial system is fundamentally based on short-term profiteering rather than long-term resilience building and fostering people-planet-prosperity together. From a short-term perspective, there are three main issues that complicate financing of a transformative green and just transition by reinforcing existing structures:

- Investors seek the highest, risk-adjusted return on investment in a financialised economy; improving environmental or social outcomes is not the core objective.
- Neither externalities nor the needs of stakeholders are integrated in financial markets or prices.
- Access to funding is often limited to high-income countries. Lower-income countries lack access to the financial capital needed to mitigate impacts of environmental damages and transition their economies.

The focus on financing change and redirecting capital flows, by allocating capital to low-carbon technology for example, overlooks the deeper inequalities embedded in the current financial system that is based on short-term profiteering rather than long-term resilience building.

Finance redefined

The System Change Compass proposes a vision for finance that serves a new economic ecosystem that works for people and the planet, generating a broadly shared prosperity. In doing so, it calls on

policy-makers to commit to the necessary regulatory standards and to de-risk opportunities to invest in sustainable solutions or ecosystem services. Without financial regulations and standard-setting policies, the financial industry will not account for environmental and social costs. These regulations and policies must be designed and aligned to ensure the valuation of both human and natural capital. For new investments and funding allocation, the EU's efforts on a science-based taxonomy must reveal the complexity of assessing green and social projects and set an important precedent for considering impacts on nature and social development in addition to climate. Sadly, these efforts are hampered by increasing politicisation of the debate—proving once again that the true obstacle to transformation is not a lack of solutions but rather a lack of political will.

In addition to private finance, public finance and fiscal policies need to shift: All public investments should be orientated towards catalysing system change along the lines of the principles outlined in this chapter.

In the international context, European financial institutions are leading the way in terms of promoting a high ambition regulatory accounting standard. A global standard would curb the most extractive and degenerative elements of the financial system and encourage international agents (International Monetary Fund, World Bank) to commit to policies such as divesting from fossil fuels (like the EIB is doing as of this year already). Moreover, building on the Dasgupta review,¹⁰² the EU should collaborate with international partners to establish the mechanisms for valuing ecosystem services and de-risking investments into those services to ensure long-term returns. With EGD linked initiatives, such as the Global Gateway strategy, the EU commits to green investments abroad and contributes to balancing distribution and flows of capital globally.

100 International Renewable Energy Agency, *World Energy Transitions Outlook: 1.5°C Pathway* (Abu Dhabi, 2021), www.irena.org/publications.

101 Allianz SE, *Allianz Global Wealth Report 2021*, 2021, https://www.allianz.com/en/economic_research/publications/specials_fm/2021_10_07_AllianzGlobalWealthReport2021.html.

102 Dasgupta, *The Economics of Biodiversity: The Dasgupta Review*.

The big question will be around financial compensation for both losses and damages to the most vulnerable communities due to climate change as well as financial compensation for economic activities that are stopped because of the transition: What will oil producing countries receive in return for keeping their oil in the ground? Or countries that hold Global Commons—such as the Amazon Rainforest—the lungs of the world—which must be kept intact for planetary and human survival? What are some solutions for the shifts in trade deficits and public debt issues that will undoubtedly arise when shifting away from trade in resources to ecosystem services?

Finally, in addition to shifting where financial capital flows in the short term, the EU could play a leading role in rethinking the international financial architecture and contributing to conversations around “changing finance” in the long-term. These conversations include redesigning the current Bretton Woods institutions and building a financial system that underpins new economic principles, places a value on social and environmental capital, and truly services the “many” rather than the “few.”

PRINCIPLE 9

Redefining governance—provide sustainable stewardship of global resources through equitable and science-based governance systems.

Current paradigm and dynamics

Global governance mechanisms are characterised mainly by top-down and static, slow normative policy processes that are anchored in short-term decision-making rather than long-term planning. Moreover, the COVID-19 pandemic made very transparent that regional, national, and international governance structures are not apt for a decision-making process based on scientific insights and data.¹⁰³

The UN Climate Change Conference COP26 (November 2022) failed again to deliver on the USD100 billion a year, first pledged over five years ago in Paris, promised by wealthy nations to support climate adaptation and resilience in the most vulnerable countries. It is but one example of how existing (multilateral) governance structures fall short on addressing the enormous climate, biodiversity, and health challenges we face. Innovation and new approaches are needed, including a balance between centralised and decentralised governance models. The consequences from these governance failures are highlighted in the Intergovernmental Panel on Climate Change (IPCC) report, “*Climate Change 2022—Impacts, Adaptation and Vulnerability*”: Adaptation is unequally distributed across regions, and gaps are partially driven by widening disparities between the estimated costs of adaptation and documented finance allocated to adaptation. The largest adaptation gaps exist among lower-income population groups.¹⁰⁴

Governance redefined

The global scope and interconnectedness of the interlinked social and ecological challenges call for a more systemic approach to governance. Global governance structures and international institutions are characterised by systems failures already outlined in principles 1-8: The predominance of neoliberal economic foundations, including the paradigm of GDP growth and imbalanced LIC representation, have led to insufficient legitimacy, fragmented responsibilities, and a siloed approach to policymaking within institutions.

Existing international, national, and local structures need to be updated to the needs of the 21st century. These structures should, first and foremost, be science-based and address the root causes of

103 World Health Organisation, “The COVID-19 Pandemic Calls for Urgent Reform of Health Care, Surveillance and Governance in the WHO European Region and Beyond,” September 2021, <https://www.euro.who.int/en/media-centre/sections/press-releases/2021/the-covid-19-pandemic-calls-for-urgent-reform-of-health-care,-surveillance-and-governance-in-the-who-european-region-and-beyond>.

104 H.-O. Pörtner et al., *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers* (IPCC, 2022), 35.

problems by placing a value on human and natural capital. Secondly, such structures need to increase the diversity of voices and actors present at the table of political decision-making—from the inclusion of youth representatives in global fora to increased transparency and public consultation on policy processes. Finally, governance structures need to enable a horizontal, whole-of-government approach to policymaking. Decision-makers need to adopt a mission-driven approach to policymaking that is rooted in the 10 principles outlined in this chapter.

Yet, a global green and just transition can only be achieved if new forms of governance are brought to life and promoted by transformational leaders, as outlined in principle 10. In redefining governance, it is crucial to inspire new types of “decision-makers” to get involved in the conversation around the global transition and governing of our planet and its resources—from local-level policymakers (i.e., in cities and regions) to indigenous communities, workers, and citizens at large (e.g., through inclusion in deliberation processes for global pledges such as Nationally Determined Contributions). Digitalisation offers lots of tools to also include cities/regions/citizens from all over the world. Such solutions could also help in circumventing corrupt regimes.

Ultimately, environmental topics and just transition need to be mainstreamed across governance structures and be core foundations or key objectives for all policymakers and organisations working on governance—rather than a separate workstream or a separately mandated department or division. This would allow a shift away from the “climate,” “environmental” or “economic” governance siloes and towards a whole-of-government approach for a sustainable future within planetary boundaries. Inspiration can be taken from the way the SDG’s 2030 Agenda has been integrated into policymaking.

Chapter 4 of this report outlines in more detail what a redefined global governance system could look like and how existing gaps and barriers can be overcome, including bridging the institutional gap for international resource management and redesigning international institutions to enhance legitimacy and effectiveness.

PRINCIPLE 10

Redefining leadership—be good neighbours and ancestors by building trust across geographies and generations through inclusive and long-term decision-making.

Current paradigm and dynamics

High-income and consuming countries have repeatedly shown failures at compassionate leadership. The Climate Change Conference COP26 is a perfect case in point: Not just in terms of failure to deliver on important financial commitments and pledges to low-income countries (LIC), as previously mentioned in principle 9 above,¹⁰⁵ but also in terms of barriers to equal representation: Youth or civil society attendance was hindered due to strict COVID-19 rules. Even official country delegations—disproportionally delegations from African countries—could not participate due to the failure of the UK Presidency to honour a pledge to offer COVID-19 vaccines to all delegates as well as late or denied visa requests.

Today, leadership on the international level is fragmented and distrusted by most of civil society due to the perception of the persistent promotion of inequality and favouritism. Many leaders fail to account for historical imbalances in the sharing of prosperity on this planet: Regions where social, human, and environmental capital have been exploited (mostly in LIC) in service of economic

105 Liane Schalatek and Erin Roberts, *Deferred Not Defeated: The Outcome on Loss and Damage Finance at COP26 and next Steps*, Heinrich-Böll-Stiftung, December 16, 2021, <https://us.boell.org/en/2021/12/16/deferred-not-defeated-outcome-loss-and-damage-finance-cop26-and-next-steps>.

capital (mostly HIC) are not sufficiently able to participate in global leadership dialogues. Moreover, the people and generations who will suffer the most from the effects of the multiple environmental social crises are not being heard and included in the leadership circles that decide the future of our planet.

An additional shortcoming of those who are leading efforts to address climate change is that they do not recognise or take action on the associated costs of this transition, such as losses of traditional industries, are unevenly distributed and will disproportionately affect specific regions and age groups.

Leadership redefined

A new social contract is needed to meet the challenges of climate change. It must be intergenerational, diverse, and based on the implementation of the SDGs and EGD as a minimum requirement. The success of this contract depends on a new kind of leadership: Good leaders are first and foremost good stewards and ancestors—ready to unpack the tensions between social and environmental goals and to address the deep inequalities within countries and between regions.¹⁰⁶ Equally important, however, is the creation of governance structures and political systems that allow for good leaders to have access to policymaking. Redefinition of leadership therefore includes a redefinition of political participation and representation as well as a redefinition of the relationship and balance of power between governments, business, and citizens.

In the international context, there is a need for new understandings of leadership that strives towards achieving the globally agreed SDGs and international agreements such as the Paris climate accord. Leading through the required system change requires actors

that have an intergenerational, holistic perspective on interests across the planet, and seek to build global capacity to meet the challenges of the future. The development of global transition pathways—and the transition of economic ecosystems—must consider historical negative contribution and environmental damages caused by economic exploitation. New leaders must build credible win-win scenarios that grow prosperity globally and redress historical imbalances.

Research indicates that future-proof leaders need to be younger, often women, from ethnically diverse backgrounds, and rooted in societal action or entrepreneurship. It is apparent that in COVID-19 management, the states that were largely successful (in terms of communicating to populations, fostering solidarity, achieving low infection numbers, and providing fast vaccinations resulting in high vaccination rates) had (young) women as heads of state.¹⁰⁷ These new leaders of the future will move from “ego” to “eco.” They will be truly “glocal” by combining global perspectives with local activism, social entrepreneurship, and the development of new prosperity within planetary boundaries.

Kate Raworth’s Doughnut Economic Model, for example, may provide a structural framework for a socio-economic model that creates people-planet-prosperity. The 10 principles redefined in this chapter, when applied consistently, may guide the transition towards such model. Yet, in the end, it takes courageous leaders to implement the vision of radical transformation and system change.—These leaders must shift policies away from seeking power for personal benefit and making decisions based on short-term goals and towards a more collective sense of leadership that develops equitable long-term solutions to the climate crisis.

106 See: Roman Krznaric, *The Good Ancestor: How to Think Long Term in a Short-Term World* (The Experiment, 2020).

107 Jane Dudman, “Female Leaders Make a Real Difference. Covid May Be the Proof,” *The Guardian*, accessed December 6, 2021, <https://www.theguardian.com/society/2020/dec/16/female-leaders-make-a-real-difference-covid-may-be-the-proof>.

2.2 SYSTEM-LEVEL ORIENTATIONS: RECOMMENDATIONS TO EUROPEAN UNION POLICYMAKERS

Where the first part of this chapter lays out an alternative vision of our socio-economic and political systems and defines *what* policymakers should aspire to, the second part of this chapter explores *how* these redefined principles can be operationalised and how such an integrated approach may be implemented. A fundamental question faced by policymakers is this: Which shifts in external policies are required to create systems that honour the 10 system change principles outlined in section 2.1?

To answer this question, section 2.2 provides 30 system-level orientations (recommendations) for policymakers to demonstrate concretely how the redefinition of these principles may be achieved in practice. Or, in other words, how Europe’s green ambitions can be met while also contributing to equity and resilience in global governance structures.

While these system-level orientations are written for EU policymakers, these recommendations may be of relevance to any policymaker working towards a green and just transition globally and can be applied to other “green deal”-type policy frameworks.

TABLE 1
System-level orientations for the EU’s international role

COMPASS PRINCIPLE	SYSTEM-LEVEL ORIENTATIONS FOR THE EU’S INTERNATIONAL ROLE
<p>PRINCIPLE 1 Redefining Prosperity – leave neocolonial resource extraction patterns behind and fairly distribute the value created in supply chains</p>	<ol style="list-style-type: none"> 1. Include obligatory modelling of long-term impacts on regional and international resource use and intergenerational equity into EU policy decisions, from industrial to agricultural policy. Advocate for respective international standards as well as invest in societal and economic stability and resilience, with a specific focus on equity in quality of life and social cohesion. 2. Lead an international, inclusive process for science-based knowledge creation and stakeholder consultation with the mission to better leverage fiscal policies for sustainable resource management and realise a more just distribution of benefits between resource rich lower-income countries and multi-national enterprises. This initiative should also examine how global cooperation could prevent or reverse a race to the bottom in LIC taxation policy. 3. Promote wellbeing economy policies inside and outside the EU.¹⁰⁸ Establish specific indicators for social and environmental standards that guarantee a shift towards more equity, wellbeing and higher minimum standards for people working for subsidiaries/suppliers of EU-based multinational enterprises. Introduce an (enforced) legal liability within the EU for the parent company/principal to safeguard these indicators in the respective foreign jurisdiction.

108 Dixson-Declève and McLeod, *21st Century Wellbeing Economics: The Road to Recovery, Renewal & Resilience*,

COMPASS PRINCIPLE**SYSTEM-LEVEL ORIENTATIONS FOR THE EU'S INTERNATIONAL ROLE****PRINCIPLE 2**

Redefining Natural Resource Use – reduce material footprints in high-consuming countries; build ecologically and socially sustainable systems in low-income countries

1. While decreasing Europe's material footprint (and monitoring that effort), **commit to minimising directly resource-related impacts along Europe's value chains** and maintaining a fair share of resource to use for low-income countries, by setting concrete targets.
2. Show leadership in multilateral and bilateral trade agreements by **enabling lower-income countries to export services** and find other **ways of securing essential income in international currency** that are not based on resource-intensive exports. Ensure debt relief (e.g., debt cancellation for nature preservation) in order to help LIC achieve financial stability.
3. To improve climate and biodiversity governance, oblige EU member states to **report impact footprints related to consumption** (in addition to impacts directly created within borders through production), and make pledges (e.g., NDCs) to mitigate these within and beyond EU borders.

PRINCIPLE 3

Redefining Progress – maximise wellbeing through context-specific, nationally determined transition pathways

1. **Redefine progress using holistic measures that include social, ecological, and economic indicators** (e.g., the Human Development Index¹⁰⁹ and the beyond GDP indicators as proposed by the WEGo governments¹¹⁰). Collaborate with new economists¹¹¹ and institutes¹¹² to lead on **envisioning a desirable economy and society based on new progress indicators including decarbonised, dematerialised, and regenerative economic ecosystems** and derive a new understanding of progress, as well as pathways to reach it.
2. **Measure performance of the European economy, as well as exports, in terms of resource productivity.** That is, economic performance should also be measured by how much societal function (e.g., mobility delivered) is created per amount of material used (e.g., cars in circulation). This would be in addition to labour productivity.
3. Take leadership in integrating a **similar logic in international economic institutions, defining, and reporting economic progress** as societal function provided per resource input and environmental impact.

109 United Nations Development Programme, "Human Development Index (HDI)," accessed January 11, 2022, <http://hdr.undp.org/en/content/human-development-index-hdi>.

110 WEGo, "Wellbeing Economy Alliance."

111 Kate Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* (Random House Business, 2017), <https://www.kateraworth.com/>; Tim Jackson, *Prosperity Without Growth: Economics for a Finite Planet* (Earthscan, 2009), https://books.google.com/books/about/Prosperity_Without_Growth.html?id=jarKLCDcePYC; Robert Costanza et al., "The Value of the World's Ecosystem Services and Natural Capital.," *Nature* 387 (1996): 253–60, <https://doi.org/10.1038/387253a0>.

112 Such as The Club of Rome, The Wellbeing Economy Alliance, and the Beyond Bretton Woods initiative.

COMPASS PRINCIPLE	SYSTEM-LEVEL ORIENTATIONS FOR THE EU'S INTERNATIONAL ROLE
<p>PRINCIPLE 4</p> <p>Redefining Metrics – measure the full impact of national consumption and production on global planetary boundaries and social wellbeing</p>	<ol style="list-style-type: none"> 1. Work towards an internationally aligned deployment of wellbeing indicators (building on existing initiatives like WEGo, the Resilience Dashboards or the Social Sustainability framework¹¹³) to measure performance of the economy in wellbeing productivity per resource input (and monitor the functionality per ecosystem). Agree on a science-based international classification system, establishing a list of environmentally and socially sustainable economic activities (Taxonomy). Agree on international standards for risk assessment that are founded on science-based criteria for nature and factor in the costs of natural climate disasters and instability impacts such as climate induced mass migration. Agree on international standards for placing a value on nature (natural capital accounting) and transparency of value chains to protect natural capital and social capital; based on open-source databases managed by an independent international institution and standardised international company reporting on resource footprints and value-chain impacts.
<p>PRINCIPLE 5</p> <p>Redefining Competitiveness – apply collaborative and mission-oriented methods between countries and at company-level to enhance global societal wellbeing, particularly for the least well-off</p>	<ol style="list-style-type: none"> 1. Set up and contribute to an international “just transition fund” that supports lower-income exporting countries to transition from linear extractive industries to new economic activities that generate value in a sustainable way (e. g., through the circular economy, ecosystem services or decarbonised and dematerialised, outcome-based services). Lead the required technological transfer to ensure that lower-income countries can successfully leapfrog harmful and polluting technologies and industry practices. Enable them and Europe's trading partners to quickly partake in circular and regenerative value chains (for example regenerative bio-economy models) or service providers with a fair share of the value created across the value chain, create amnesties for intellectual property on key technologies to broaden their application internationally. Direct innovation funding (domestic and international) towards reshaping industry to achieve societal goals beyond jobs and economic growth.¹¹⁴ Shift international competition towards mission-oriented collaboration for the development of systems solutions in service of wellbeing and ecological protection.¹¹⁵

113 European Commission, “What Are the Resilience Dashboards?,” Text, accessed January 11, 2022, https://ec.europa.eu/info/strategy/strategic-planning/strategic-foresight/2020-strategic-foresight-report/resilience-dashboards_en; WEGo, “Wellbeing Economy Alliance.”; Efrat Eizenberg & Yosef Jabareen (2017), “Social Sustainability: A New Conceptual framework”, in *Sustainability* 9(1), p. 68: <https://www.mdpi.com/2071-1050/9/1/68>.

114 In line with DG R&I's concept of Industry 5.0, see: Breque, De Nul, and Petridis, “Industry 5.0.”

115 Sandrine Dixson-Declève et al., *Transformation Post-COVID: Mobilising Innovation for People, Planet and Prosperity* (LU: Publications Office of the European Union, 2021), 3-6, <https://data.europa.eu/doi/10.2777/034554>.

COMPASS PRINCIPLE**SYSTEM-LEVEL ORIENTATIONS FOR THE EU'S INTERNATIONAL ROLE****PRINCIPLE 6**

Redefining Incentives – create transition-supporting economic and legal incentives by ending unsustainable subsidies, recognizing the value of ecosystems, and ensuring transparency and accountability in global value chains

1. Work towards **global standards that fully incorporate the environmental and social costs of GHG emissions and resource extraction in the pricing of materials** and goods. Enable countries that export to EU to capture the compensation for outsourced impacts in their domestic budgets (e.g., through taxes), thereby ensuring that all value from and costs associated with pollution and resource extraction is captured or compensated locally.
2. **Phase out all harmful and unsustainable subsidies** supporting extraction, (over) consumption, and disposal of natural resources. Redefined incentives should encourage all international partners follow suit as soon as possible. These funds should be shifted to just transition programmes or compensation for those countries most impacted.
3. **Measure ecosystem services at a global level and recognise their value financially** for countries whose natural ecosystems provide them—particularly in the tropical belt. Create a global conservation fund as finance instrument (building on the EU's EUR 1 billion pledge at COP26 to conserve forests and create sustainable commodity production).

PRINCIPLE 7

Redefining Consumption – raise environmental and social standards of products globally and move from owning to using where beneficial

1. Work towards setting and enforcing **minimum environmental and social standards for imports in the EU**, based on ambitious and science-based criteria and work towards making these standards a norm in international trade rules. Enforce supply chain transparency along the entire value chain (such as through product/service passports which could be governed by a recognised international standards organisation (such as ISO).
2. **Enable business models that promote stewardship of products** and ensure maximum resource efficiency per consumer function (for example through global innovation funds or tax breaks). Take international leadership in analysing the legal and trade implications of “as a service” business models.
3. Broaden the political debate from efficiency to sufficiency: **Work with international partners to apply a maximum consumer footprint per capita** to stimulate reductions in consumption and demand.

COMPASS PRINCIPLE**SYSTEM-LEVEL ORIENTATIONS FOR THE EU'S INTERNATIONAL ROLE****PRINCIPLE 8**

Redefining Finance – increase capacity to finance positive, regenerative change while making the financial system equitable

1. **Ensure multilateral financial accounting takes into consideration the risks of climate, nature, and biodiversity impacts** and adopts associated indicators in order to ensure planetary boundary-based decision-making (for example: The Taskforce on Nature-related Financial Disclosures (TNFD) or the Corporate Sustainability Reporting Directive (CSRD). Put in place associated “stress tests.”
2. **Enhance development aid criteria so that aid enables shifts in trade deficits and debt dependencies and allows for the leapfrogging of harmful economic practices.** Scale-up and support alternative finance models (such as micro finance and gender-based finance fostering women’s empowerment projects) to achieve greater sustainability, enhanced global environmental stability and local/community stewardship of the global commons and public goods. **Ensure that development aid builds and reinforces local sustainable development pathways** rather than enforcing European pathways on other countries.
3. **Lead in dialogues on shifting the global financial architecture** (including beyond Bretton Woods¹¹⁶), i.e., restructuring finance institutions to ensure the EU does not just finance change but also contributes to “changing finance.”¹¹⁷

PRINCIPLE 9

Redefining Governance – provide sustainable stewardship of global resources through equitable and science-based governance systems

1. Elevate global cooperation to **advance economic and societal models that are based on long-term planning**, beyond democratic election terms. Employ governance structures that foster the voice of citizens, science, and youth through assemblies to ensure a lasting balance between people, planet, and prosperity.
2. Initiate a conversation, through for example a UNEA resolution, with global partners on the creation of a **formal international forum on stewarding global (virgin) resource use** and a supporting scientific panel.
3. **Work towards rebalancing institutional voting rights**, such as those pertaining to organisations like the World Bank and IMF, so that they better recognise improvements in equity, fairness, and responsibility.

PRINCIPLE 10

Redefining Leadership – be good neighbours and ancestors by building trust across geographies and generations through inclusive and long-term decision-making

1. **Strengthen and rebuild trust and cooperation between Europe and lower-income regions** by keeping EU promises regarding climate finance, ensuring a just distribution of COVID-19 vaccination (and future medicinal products) and moving to open the G20 to African members.
2. **Make discussions and trade-offs (for domestic and international topics) more transparent with EU citizens, clearly explaining the need for a shift in economic practices.** Involve leaders from environmentally damaged regions (also from outside Europe) in decision-making processes. Train European policymakers in understanding and communicating an equitable and socially just future.
3. **Take particular note of young and future generations, in and outside Europe, and ensure** that their voices are better heard. Promote leadership and exchange fora for these younger generations, particularly in countries with large populations of young people. Consider quotas for youth representation (ensuring regional diversity) in decision-making fora.

116 William Kring and Kevin Gallagher, eds., “Special Issue: Beyond Bretton Woods: Complementarity and Competition in the International Economic Order,” *Development and Change*, 50, no. 1 (January 2019): 1-274.

117 CoR paper, forthcoming.

3. INTERNATIONAL IMPLICATIONS OF THE TRANSITION IN ECONOMIC ECOSYSTEMS

A systemic transition in Europe will have profound implications for international trade flows and relationships. While the previous chapters set out guiding principles and policy orientations for systemic change in the EU and beyond, this chapter takes up the economic ecosystems logic of the *SCC (2020)* to explore in more detail the implications for Europe's international (trade) partners that might arise from decoupling societal needs and resource consumption in the EU.

Since the announcement of the EGD, various regulations and other policy instruments have been developed or proposed. A number of these target the EU's (trade) relations with partner countries, others with a more domestic scope will have implications

“The EU can build relationships with low-income countries in ways that overcome historical dependencies and put collaboration front and centre”

for countries outside of the EU as well. For instance, the EU is establishing a Carbon Border Adjustment Mechanism (CBAM), new Product Standards (Sustainable Products Initiative¹¹⁸), classification standards that facilitate sustainable investments (EU taxonomy¹¹⁹), as well as value chain standards such as the Proposal for a regulation on deforestation-free products,¹²⁰ or the EU regulatory framework on company law and corporate governance.¹²¹

When looking at the impact of these policies and standards, it is crucial to acknowledge the current status quo of international dynamics, namely the EU's international footprint in emissions, loss of biodiversity and pollution, and the strong economic dependencies of low-income countries created by past and current EU consumption patterns. Overconsumption in high-income countries continues to cause environmental damage and drive climate change and water scarcity. European measures to promote sustainability vis-à-vis their trade partners

118 European Commission, “Sustainable Products Initiative,” accessed January 11, 2022, https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative_en.

119 European Commission, “Why Do We Need an EU Taxonomy?,” EU taxonomy for sustainable activities, accessed January 11, 2022, https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en.

120 European Commission, “Proposal for a Regulation on Deforestation-Free Products,” November 17, 2021, https://ec.europa.eu/environment/publications/proposal-regulation-deforestation-free-products_en.

121 European Commission, “Sustainable Corporate Governance,” accessed January 11, 2022, https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12548-Sustainable-corporate-governance_en.

are a double-edged sword: While they promote sustainable outcomes, they also make exporting to the EU harder, and could cause economic hardship especially for smaller firms and LIC.

Several types of implications can be distinguished:

- **For some products/commodities, import flows might decrease or stop entirely**, thereby negatively affecting exporting states' trade balances and foreign companies' revenues; this would also be likely to negatively affect employment and livelihoods in LIC that are, to a certain extent, dependent on exports to the EU.

For instance, efforts in the EU to retain the use-value of textile products and decrease consumption at consumer level might result in decreased demand for textile imports. This would have a significant impact on producers in Bangladesh, for which the EU is the top export destination. In the short term, the decrease in demand from European retailers might even worsen the working conditions in this already precarious sector as it leads to increased competition between textile producers.

“The EU must reduce its consumption of 'fast fashion' and increase circularity while minimising negative short-term impacts on Bangladeshi workers”

Eight Economic Ecosystems

The System Change Compass identifies eight major economic activities as “economic ecosystems” that constitute an alternative to the economic areas and sectors conventionally used to organise the economy.

Four of these eight economic ecosystems (healthy food, built environment, intermodal mobility, and consumer goods) meet a specific societal need (nutrition, housing, mobility, and other daily functional needs). The other four ecosystems (nature-based, energy, circular materials and information and processing) support the first four economic ecosystems in their delivery of societal needs (e.g., the energy ecosystem supports the intermodal mobility ecosystem as well as the built environment ecosystem).

The reason for the focus on these societal needs is that they have the biggest impact on our resource consumption in Europe and are closest to the areas addressed through the EGD. The authors recognise that there are many other societal needs, including education, health, and political voice.

“Côte d'Ivoire produces half of Europe's cocoa but poses a challenge for its deforestation regulations”

- **Stricter standards for certain products imported into Europe might become de facto trade barriers** unless trade partners comply with these standards and change their production processes/inputs; accordingly, at least in the short term, trade partners might also react by implementing retaliation measures in the form of trade barriers for EU exports.

For instance, the European deforestation regulation, which aims at stopping the import of commodities linked to forest destruction, might affect a significant share of imports from Côte d'Ivoire, where cocoa production has been a driver of ongoing deforestation. The country currently accounts for almost half of the European cocoa supply, and domestic governance and monitoring practices will need to significantly improve to make sure that cocoa production does not cause more destruction of forests.

- On the other hand, **increased imports of materials that enable more circular and climate-friendly solutions** might be triggered where the EU does not have the domestic capacities to meet the unprecedented demand or is fully import-dependent; this could potentially result in price increases for these materials on global markets.

This will, for instance, be the case for materials needed for battery production, such as copper, cobalt, and rare earth materials. Since a more sustainable mobility system in the EU includes the electrification of vehicles to reduce the consumption of fossil fuels, the demand for these materials is expected to rise significantly, e.g., demand for cobalt (a large share of which is currently produced in the Democratic Republic of the Congo) is likely to increase by 300% within 5 years.¹²² A mining boom in the DRC will drive further governance problems and could lead to further conflict in a fragile region and further environmental degradation because it is impossible to enforce high processing standards where rule of law is lacking.

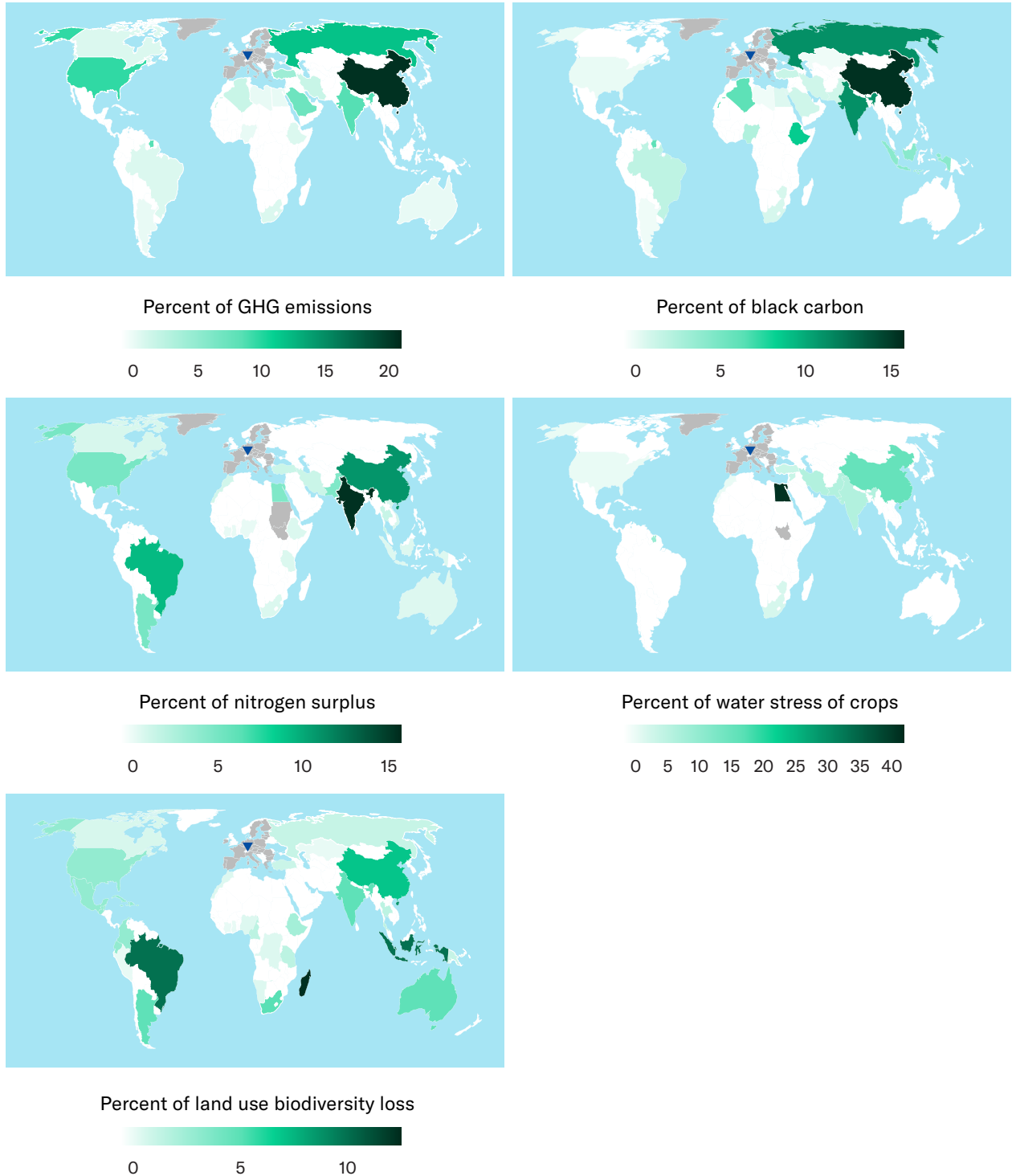
- If aligned with domestic EGD standards, **European exports will have less negative environmental impacts on downstream value chains** and be more fit for future markets in a net-zero world. However, in the short term, they might suffer from reduced competitiveness on the global market, while export destinations would need to swiftly develop the respective capacities for shifting towards more sustainable economic ecosystems to have a positive impact.

For instance, European cement exports to the US—which are currently both material- and carbon-intensive—might decrease, and potentially be replaced by exports of machinery and services that facilitate a more circular and low-carbon built environment. Yet to generate the international demand for the latter, the export destinations would need to develop respective domestic incentive structures, know-how, and complementary services (e.g., smart urban planning) to deploy these services and machinery.

122 Louis Bacani, “Insight Weekly: US Stock Performance; Banks’ M&A Risk; COVID-19 Vaccine Makers’ Earnings,” accessed January 11, 2022, <https://www.spglobal.com/marketintelligence/en/news-insights/blog/insight-weekly-us-stock-performance-banks-ma-risk-covid-19-vaccine-makers-earnings>.

FIGURE 6

Percentage of the EU27's spillover impacts by country where impact occurs



Source: SDSN, Yale Center for Environmental Law & Policy, and Center for Global Commons at the University of Tokyo, *Global Commons Stewardship Index 2021*.¹²³

123 SDSN, Yale Center for Environmental Law & Policy, and Center for Global Commons at and the University of Tokyo, "Global Commons Stewardship Index 2021" (Paris; New Haven, CT; and Tokyo, 2021), <https://irp.cdn-website.com/be6d1d56/files/uploaded/GCS-Index-2021-Report-2021.pdf>.

“The EU must reduce its international footprint while allowing trade partners to achieve their own environmental and social goals”

These implications play out differently for different economic ecosystems because some of them are more accentuated in certain ecosystems, and different commodities and trade partners are affected depending on the current international trade patterns in different sectors.

The EU must make sure that the transition in Europe not only reduces the EU’s international environmental footprint but is also implemented in a way that mitigates potential short-term negative impacts. Reduction of the EU’s footprint must create opportunities for trade partners that allow them to achieve their own environmental and social policy goals and continue trading with Europe.

In this context, the “Global Gateway” initiative launched by the European Commission¹²⁴ could be an important lever: The strategy to leverage infrastructure investments in EU’s partner countries is mainly seen as a European response to China’s Belt and Road Initiative. However, it does not only foster connectivity, but is also aligned with the SDGs and the Paris Agreement. Over a five-year period (2021-2027), the EU commits to mobilise up to EUR 300 billion of investments to strengthen digital, climate and energy, transport, health, education, and research infrastructures globally. This does not necessarily imply an increase of Europe’s development assistance by this amount, but rather a consolidation of existing finance instruments, plus the mobilisation of private investment. An advantage of focusing on the strategic issue of infrastructure development is that inefficiencies within Europe’s current development finance system can be eliminated. Also, the focus on partner countries’ needs and strengthening domestic

expertise and technical capacity development could enable long-term positive impacts in low-income countries. To ensure that the Global Gateway and similar initiatives will contribute to making the EGD an internationally just and sustainable transition, the EU needs to consider the international trade-offs and opportunities of the transition when developing and delivering respective projects with international partners.

This chapter therefore focuses on:

- **The status quo of international dynamics within the four economic ecosystems (plus the four supporting ecosystems):** providing a high-level description of the current interlinkages between key economic ecosystems and international resource and trade flows. This focus takes into account, for instance, how EU consumption externalises environmental and social costs along the value chain, and how current levels of imports, exports, and investments have created dependencies between the EU and other regions/countries.
- **The effects of an EGD-based transition of EU economic ecosystems on international dynamics,** outlining the impacts of a systemic sustainability transition on these (trade) dynamics. This analysis is based on the ecosystem-level policy orientations of the *System Change Compass (2020)*, and key initiatives under the EGD, such as CBAM and ISO standard-setting.
- **Recommendations for achieving fairer and more sustainable international dynamics,** making suggestions on how the EU could address trade-offs and ensure that the transitions of economic ecosystems are socioeconomically just along the value chain. Particular attention is given to how potential negative effects can be mitigated, and to how the environmental and social costs currently displaced outside of EU boundaries can be internalised.

124 E3G, “‘Global Gateway’: The EU Green Deal Goes Global,” December 1, 2021, <https://www.e3g.org/news/global-gateway-eu-green-deal-goes-global/>.

3.1 BUILT ENVIRONMENT




FIGURE 7

Overview of built environment ecosystem

Status Quo


<p>Globally Low-resource efficiency in construction and use phase of buildings</p>	<p>Europe's imports are highly emission-intensive and create geopolitical dependencies</p>	<p>Europe's exports are often highly resource- and emission-intensive (e.g. steel and cement) and drive inequality and linear usage patterns</p>	<p>In LIC/MIC Rapid (unplanned) urbanization and massive floor area growth exacerbates environmental pollution, inequality and social instability, rapid spread of disease, and higher vulnerability of crucial infrastructure to disasters</p>
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System Change Compass vision for the EU


- High quality of life in more densely populated areas
- Greener, more interconnected cities and sharing communities
- Higher material and energy efficiency in buildings
- Clean energy sources

International implications and opportunities of an EU System Change Compass transition




DECREASE OF EU IMPORTS FOR SPECIFIC PRODUCTS

A transition towards a low-carbon, circular built environment in the EU lowers the demand for imports of **(virgin) steel and natural gas** leading to a decrease of the EU's dependency on trade partners like Russia




TRADE BARRIERS THROUGH STRICTER STANDARDS

Stricter **carbon emissions standards** requires transitions in producing countries (mainly LIC/MIC). Foreign steel producers that export to the EU would need to change their production routes / explore new circular technologies to be able to maintain trade relations with the EU



INCREASE OF EU IMPORTS FLOWS OF SPECIFIC MATERIALS

More imports needed in Europe for **circular materials, renewables, and battery materials** leading to new export markets for LIC/MIC (low-carbon, circular materials, renewable energy, hydrogen, and battery related material)



FEWER NEGATIVE IMPACTS BY EU EXPORTS

New export markets for Europe (**circular renovation services, machinery for circular practices**) whereas downstream value chains would benefit - especially if the EU cooperates with third countries

Definition of the economic ecosystem

The built environment economic ecosystem refers to all human-made environments that provide the setting for human activity, from farms to cities. It is the space in which people live and work, day-to-day, thus serving their needs of accommodation, organisation, and representation. This system primarily serves the need for housing. However, a modern built environment also includes access to healthy food and community gardens; it influences mental and physical health; it needs to ensure amenities for pedestrians and cyclists. As such, it has strong connections to other economic ecosystems.

Status quo of international dynamics

Rapid urbanisation and low resource efficiency pose major challenges to the global built environment.

The international dynamics between the EU and other regions/countries need to be viewed in the context of key global challenges affecting this economic ecosystem and the limits of what the Earth can provide in resources. In comparison to high-income regions, where the focus in the built environment is shifting towards retrofitting of existing building stocks and population growth, rapid urbanisation in low- and middle-income regions contributes to massive floor area growth. This often results in unplanned urbanization, which exacerbates a number of problems, such as environmental pollution, inequality and social

instability, rapid spread of disease, and higher vulnerability of crucial infrastructure to disasters.¹²⁵ Due to the expected increase in global floor area, embodied carbon emissions associated with new construction between 2020 and 2050 are anticipated to be as important as operational carbon emissions. Globally, the efficiency of resource use in construction and use phase of buildings is low, with 15% of buildings materials being wasted in the construction phase, and the overuse of steel and concrete amounting to up to 50%. Moreover, especially in HIC, much of the built environment is under-utilised or abandoned.¹²⁶ If current practice is continued, steel manufacturing will occupy what corresponds to about 50% of the safe operating space for climate change by 2100.¹²⁷

From a European perspective, international trade in steel and cement—as the key materials for construction—and the supply of energy for heating play an important role. For individual material categories (like steel or wood) or individual trading partners (like Turkey or Brazil or Indonesia), the resources used in this ecosystem represent a major factor for local economies and livelihoods.

The EU's resource imports for the built environment are highly emission-intensive and contribute to geopolitical dependencies.

The construction sector is the largest consumer of steel, accounting for up to 50% of total steel use. While the EU is a significant producer of steel itself, 24% of the steel used in the EU is imported (as of 2019), mainly from Turkey, Russia, South Korea, and Ukraine.¹²⁸

125 Material Economics, *The Circular Economy a Powerful Force for Climate Mitigation*, 2018, 6&48, <https://materialeconomics.com/publications/the-circular-economy-a-powerful-force-for-climate-mitigation-1>.

126 European Environmental Bureau (EEB), *A Blueprint to Deliver a Healthy, Affordable, and Sustainable Built Environment for All*, March 2021, <https://eeb.org/library/towards-a-healthy-affordable-and-sustainable-built-environment/>.

127 Morten W. Ryberg et al., "Prospective Assessment of Steel Manufacturing Relative to Planetary Boundaries: Calling for Life Cycle Solution," *Procedia CIRP* 69 (2018): 451–56, <https://doi.org/10.1016/j.procir.2017.11.021>.

128 Statista, "Leading Exporters of Finished Steel to the EU 2020," accessed January 11, 2022, <https://www.statista.com/statistics/1129472/leading-exporters-of-finished-steel-to-the-eu/>.

Current steel production is highly emission-intensive and, today, responsible for about 8% of global CO₂ emissions.¹²⁹ While almost half of EU steel is produced using steel scrap, which has a lower carbon footprint than virgin steel production, this share is considerably lower for non-EU regions (about 28%).¹³⁰ By importing almost a quarter of the steel used, the EU construction sector is therefore “outsourcing” large parts of its embedded GHG emissions, which occur in producer countries.

When looking at the use phase of buildings, heating accounts for the highest share of energy use; in fact, heating and cooling of buildings accounts for almost 40% of total final energy demand in the EU. As heat electrification rates are still low, current heating systems mainly rely on natural gas, over 80% of which is being imported. The EU was heavily dependent on Russian gas as the top supplier until the 2022 invasion of Ukraine and subsequent sanctions. Yet energy efficiency targets in the EU, if properly applied under the EU’s Climate and Energy package, could have enabled a fundamental decrease in gas dependency.

The EU’s exports abroad are highly resource- and emission-intensive and contribute to inefficient and linear use in the built environment.

The EU enjoys a trade surplus in cement clinker, as exports account for over 50% of total production in the EU.¹³¹ In addition, EU cement-producing companies own almost 60% of the cement and lime production capacities in the US¹³² and have significant production facilities in the rest of the world. The top destinations for cement clinker

exports from the EU are Africa, Israel, the US, and Brazil.¹³³ The use of this cement is currently highly linear in construction and inefficient in utilisation, shown for example in significant urban sprawl, especially in the US.

Potential effects of a System Change Compass transition on international trade relations

The *System Change Compass (2020)* made specific recommendations on how to achieve a systemic transformation of the built environment. It focused on achieving high quality of life in more densely populated areas, greener, more interconnected cities and sharing communities, higher material and energy efficiency in buildings, and clean energy sources. Thus, a systemic implementation of the EGD would foster, for instance, sharing models and modularity to improve utilisation rates, improved insulation of buildings, higher electrification rates of heating and cooling, increased circularity of construction materials, and the uptake of technologies that reduce the carbon footprint of steel and cement production in the EU. These measures will affect international resource and trade flows for the built environment.

Stricter carbon emissions standards and a transition towards a low-carbon, circular built environment in the EU lowers the demand for imports of (virgin) steel and natural gas.

Increased material circularity and the lower use of (virgin) materials and fossil-based energy resulting from an optimised built environment system in

129 Christian Hoffmann, Michel Van Hoey, and Benedikt Zeumer, “Decarbonisation Challenge for Steel,” June 3, 2020, <https://www.mckinsey.com/industries/metals-and-mining/our-insights/decarbonisation-challenge-for-steel>.

130 Hoffmann, Van Hoey, and Zeumer.

131 European Commission, *Competitiveness of the European Cement and Lime Sectors Summary of the Final Report* (Luxembourg: Publications Office of the European Union: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, January 2018), 11, http://publications.europa.eu/resource/cellar/06d2851d-07cd-11e8-b8f5-01aa75ed71a1.0001.01/DOC_1.

132 European Commission, “Cement and Lime,” accessed January 18, 2022, https://ec.europa.eu/growth/sectors/raw-materials/related-industries/non-metallic-products-and-industries/cement-and-lime_es.

133 European Commission, *Competitiveness of the European Cement and Lime Sectors Summary of the Final Report*, 12

Europe will not only translate to reduced domestic raw material extraction but also implies less material and primary resource imports (e.g., steel, iron ore) and less energy imports (e.g., gas). For steel, this would, for instance, imply a decrease in demand for iron ore as the main input for virgin steel production, and key trade partners such as Brazil would see a significant decrease in sales on the European market. In addition, lower demand for steel products might, in the short term, exacerbate the overcapacity of global steel supply which might depress prices on the global market and hit major steel-exporting countries. In addition to changing levels of demand, low carbon production standards will impact steel trade flows, requiring transitions in producing countries. Foreign steel producers that export to the EU would need to change their production routes and/or explore new circular technologies to be able to maintain trade relations with the EU. A decrease in demand for natural gas will lower the EU's energy dependency, especially with regard to main trade partners like Russia.

At the same time, more imports of low-carbon, circular materials, renewable energy, hydrogen, and battery-related materials will be needed to bridge the domestic supply-demand gap.

On the other hand, certain trade partners could benefit from a higher demand for (raw) materials and energy sources, as well as solutions that are crucial to enable a more sustainable built environment, and for which domestic production capacities in the EU are not sufficient, or which are not available in the EU. For instance, there could be a rise in demand for bio-based, circular, or other low-carbon construction materials (such as timber and bamboo construction materials), or environmentally friendly materials that are required for improved insulation (e.g., hemp, cellulose, or wood). The electrification of heating requires heat pumps and higher volumes of renewable energy, for which the supply of rare



earth metals and copper are crucial. Also, green steel production in the EU will require the import of green hydrogen (produced with renewable energy) to meet the future demand for hydrogen cost-efficiently.

A higher capacity for supplying circular and low-carbon materials and services could make EU exports fit for future markets in a net-zero world and might benefit downstream value chains—especially if it is accompanied by cooperation with third countries; in the short-term, however, it might result in reduced competitiveness for EU producers due to price increases for their products.

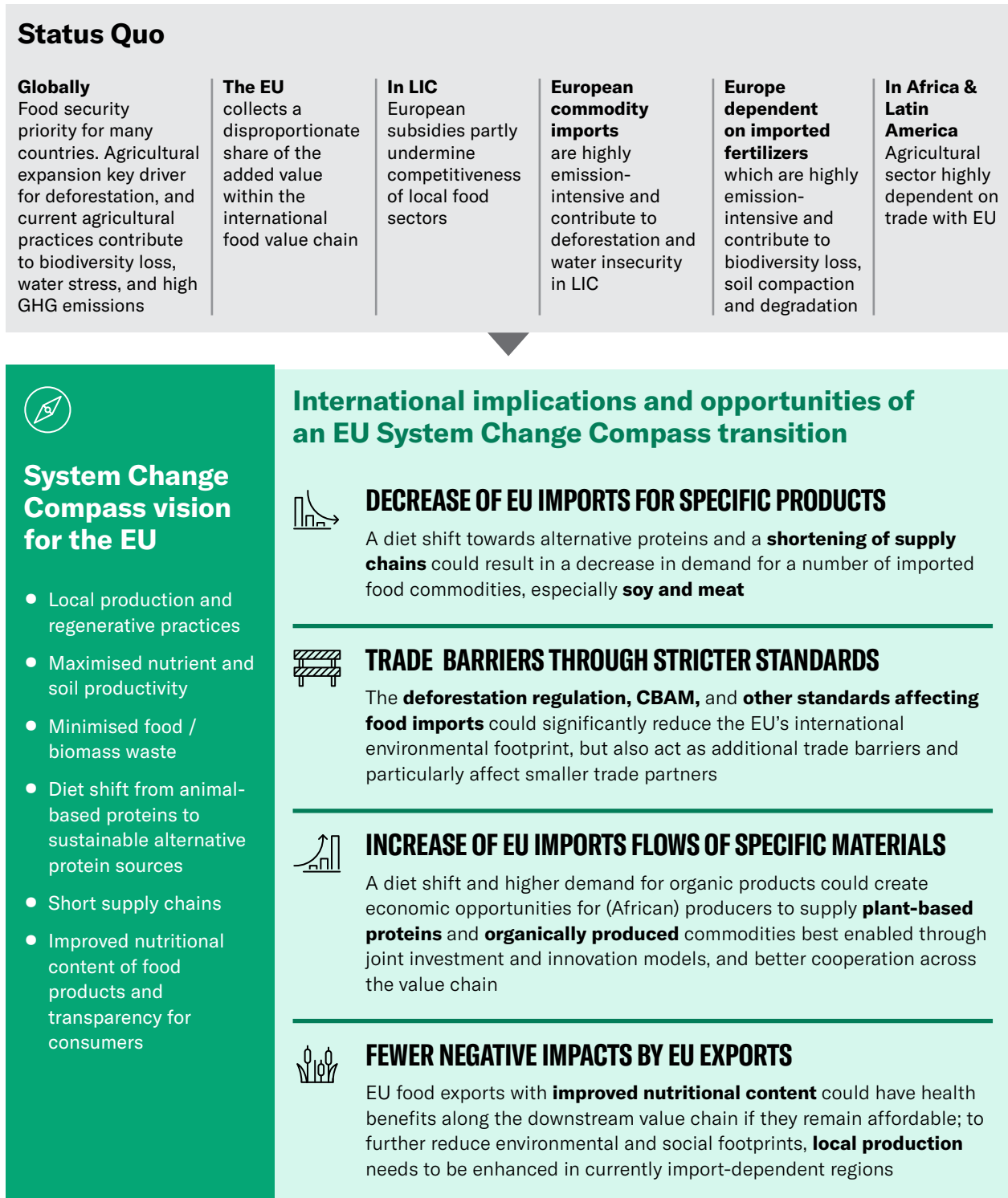
Taking responsibility for the impact on downstream supply chains means fewer material-intensive (e.g., cement) exports and potentially more exports of circular renovation services. Such services could include machinery for circular practices and better-utilised, circular, and clean built environments. Ideally, this would also include European-owned production abroad.

3.2 HEALTHY FOOD



FIGURE 8

Overview of healthy food ecosystem



Definition of the economic ecosystem

The healthy food economic ecosystem encompasses the whole lifespan of food—from its production to end-of-life. It includes how the food is cultivated (e.g., conventional vs. organic), where it is farmed (e.g., urban vs. rural farming) and what kind of food is consumed (e.g., resource-intensive, animal-based protein vs. alternative proteins). Thus, it is directly related to nature and biodiversity, for example through the use of pesticides and excessive nutrient build-up, and their contribution to soil, water, and air pollution. The healthy food ecosystem fulfils the essential societal need for nutrition. One of the key differences to other ecosystems is that supply shortages in food have much more severe consequences and socioeconomic repercussions compared to other commodities and products, and that access to food in many low-income countries is still a significant problem.

Status quo of international dynamics

Against the background of global population growth, food security remains a priority for many countries, while land use changes caused by agricultural expansion threaten to thwart climate goals.

According to the UN World Food Programme, 820 million people were already chronically food insecure before the COVID-19 pandemic, and the crisis has further exacerbated this food insecurity, having the greatest negative impact on vulnerable populations. The IPCC found that increasingly extreme weather and climate events have exposed millions of people to acute food insecurity, with the largest impacts observed in many locations and

communities in Africa, Asia, Central and South America, small islands, and the Arctic. Jointly, sudden losses of food production and access to food have increased malnutrition in many communities, especially for Indigenous peoples, small-scale food producers, and low-income households. Children, elderly people, and pregnant women are particularly impacted.¹³⁴ Geopolitical conflicts such as the 2022 Russian invasion of Ukraine put further pressure on food availability, food prices, and planting. Between them, Ukraine and Russia account for a quarter and a third of the world's wheat,¹³⁵ and significant amounts of sunflower seed exports.¹³⁶ The Food and Agriculture Organisation projects that by 2050, population and economic growth will result in a doubling of demand for food globally, but the increasing effects of climate change will make food production in some low-income countries more difficult. At the same time, the expansion of agricultural production in tropical regions is a key driver of deforestation, and current agricultural practices contribute to biodiversity loss, water stress, and high GHG emissions.

The EU collects a disproportionate part of the added value within the international food value chain, and its high agricultural subsidies partly undermine the competitiveness of local food sectors in low-income countries.

The EU has a considerable trade surplus when it comes to trade in food products: It mainly imports commodities such as coffee, tea, palm oil, and soybeans (worth approximately EUR 122 billion), mostly from low- and middle-income countries. By contrast, most of EU food exports are value-added processed foods, such as wine, pasta, and cereals (worth approximately EUR 184 billion), that are supplied mainly to high-income countries.¹³⁷

134 Pörtner et al., *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers*, 11.

135 OEC, "Wheat Product Trade, Exporters and Importers," accessed March 18, 2022, <https://oec.world/en/profile/hs92/wheat>.

136 OEC, "Sunflower Seeds Product Trade, Exporters and Importers," accessed March 18, 2022, <https://oec.world/en/profile/hs92/sunflower-seeds>.

137 European Commission, "Monitoring Agri-Trade Policy Map 2021-2" (Directorate-General for Agriculture and Rural Development [DG AGRI 2021], 11.

Also, the EU currently supports its agricultural sector with EUR 102 billion per year. This high subsidy level results in a price distortion on global markets for the subsidised products and in depressed prices for farmers in countries that cannot afford similar levels of subsidies. Multilateral trade negotiations on subsidy reductions in the last 20 years have stalled.

EU fertiliser and commodity imports are highly emission-intensive, the production of the latter contributing to deforestation and water insecurity in producer countries.

The EU is largely dependent on imports of nitrogen-based fertilisers, of which it imports over 6 million tons annually (worth EUR 3.9 billion as of 2020). These imports originate mainly from Egypt, Algeria, and Russia.¹³⁸ The Russian war in Ukraine has significant and destabilising effects on the fertilizer market: Prices for fertilizers are soaring. Combined with the price increases of fuels, farmers are alarmed that Europe's food security could be at risk. In several countries, these fears have culminated in protests by farmers.¹³⁹ However, the use of synthetic fertilizers generates significant emissions, resulting both from the overapplication of fertilizers and from the production process itself, which utilises substantial amounts of energy.

The EU is also a significant consumer of commodities associated with deforestation risks, such as beef, soy, coffee, cocoa, and palm oil, which can drive land use changes in producer countries. In addition, the EU imports a considerable amount of water-intensive food commodities, the production of which is linked to significant water (over)use, partly in water-insecure regions. In fact, 40% of Europe's water footprint currently lies outside of its borders.¹⁴⁰

The African agricultural sector, and several Latin American countries, are highly dependent on trade with the EU.

The European and African food sectors are closely linked: On the one hand, the EU is Africa's main destination of food commodity exports, with African exports to the EU reaching USD153 billion in 2018.¹⁴¹ On the other hand, several countries in Africa are net food importers (mainly Nigeria, Angola, the Democratic Republic of the Congo, and Somalia),¹⁴² and the EU is the top supplier with an export value of EUR 9.4 billion for the year 2020 of Agri food products to Sub-Saharan Africa¹⁴³ due to its longstanding trading ties with Africa. This is also true for several Latin American countries with an export value of EUR 6.5 billion for the year 2020.¹⁴⁴

138 European Commission, "Fertilisers in the EU Prices, Trade and Use," EU Agricultural Markets Briefs (Directorate-General for Agriculture and Rural Development [DG AGRI 2021], June 2019), 4, https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/farming/documents/market-brief-fertilisers_june2019_en.pdf; Trading Economics, "European Union Imports of Fertilizers - 2022 Data 2023," accessed January 11, 2022, <https://tradingeconomics.com/european-union/imports/fertilizers>.

139 Rosie Frost, "Europe's Food Security Could Be Threatened by War in Ukraine, Farmers Warn," Euronews, March 30, 2022, <https://www.euronews.com/green/2022/03/21/europe-s-food-security-could-be-threatened-by-war-in-ukraine-farmers-warn>.

140 Water Footprint Network, "Virtual Water Trade," accessed January 11, 2022, <https://waterfootprint.org/en/water-footprint/national-water-footprint/virtual-water-trade/>.

141 Sean Woolfrey and Poorva Karkare, *The Future for Africa's Trade with Europe: Factors Affecting the Long-Term Relevance of the European Market for African Exports* (European Centre for Development Policy Management, October 2021), 3, <https://ecdpm.org/wp-content/uploads/Future-Africa-Trade-Europe-Factors-Affecting-Long-Term-Relevance-European-Market-African-Exports-ECDPM-Discussion-Paper-306-2021.pdf>.

142 Louise Fox and Thomas S. Jayne, "Unpacking the Misconceptions about Africa's Food Imports," *Brookings* (blog), December 14, 2020, <https://www.brookings.edu/blog/africa-in-focus/2020/12/14/unpacking-the-misconceptions-about-africas-food-imports/>.

143 European Commission, "Agri-Food Trade Statistical Factsheet European Union - Sub-Saharan Africa" (DG AGRI, March 17, 2021), https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/farming/documents/agrifood-sub-saharan-countries_en.pdf.

144 European Commission, "Agri-Food Trade Statistical Factsheet European Union - Latin American Countries" (DG AGRI, March 17, 2021), https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/farming/documents/agrifood-latin-american-countries_en.pdf.

Potential effects of a System Change Compass transition on international trade relations

The SCC (2020) recommendations on how to achieve a systemic transformation of the European food system focused on several changes that would enhance local production and regenerative practices, maximise nutrient and soil productivity, minimise food/biomass waste, create enabling sustainable conditions, and minimise or compensate for remaining negative impacts. These changes can be achieved through practices such as promoting local production for local consumption in and outside Europe, a diet shift from animal-based proteins to sustainable alternative protein sources, regenerative agriculture, and shorter supply chains, creating a bigger market for organic food, and improving nutritional content of food products and transparency for consumers. Such practices, however, should be fostered not just on the European market but globally, and will enhance greater access to food in LIC where often precious food is exported rather than consumed at home.

The deforestation regulation, CBAM, and other standards affecting food imports could significantly reduce the EU's international environmental footprint, but also act as additional trade barriers and particularly affect smaller trade partners.

The deforestation regulation is likely to affect a share of EU trade partners producing palm oil in Indonesia and Malaysia, as well as producers of soy in Brazil and Argentina, as 14% to 23% of these commodities are currently sourced from deforestation-risk regions. However, the repercussions might be particularly noticeable in smaller agricultural economies with low diversification, such as Côte d'Ivoire, which supplies 44% of the EU's cocoa, and



where cocoa production has been a major driver of deforestation.¹⁴⁵ Smallholders often make up the majority of producers for these commodities and might have the biggest difficulties adapting to the new regulations. Similarly, applying the CBAM to fertilizer imports will have an impact on trade partners in North Africa, and particularly Senegal, where export of fertilizers to the EU accounts for up to 5% of the country's entire GDP.¹⁴⁶

A diet shift towards alternative proteins and a shortening of supply chains could result in a decrease in demand for a number of imported food commodities, especially soy and meat from Brazil.

A shift in the European food system towards alternative proteins would imply a sharp decline in livestock farming, and thus significantly reduce demand for soy, a large share of which is currently imported to the EU as feed for livestock. Similarly, demand for poultry and beef imports to the EU would potentially decline because of this diet shift. For all three commodities, Brazil is currently the main supplier to the EU. International suppliers of products that currently have long supply chains, e.g., a range of fruits, will be affected by decreased demand as well, as the EU effectively shortens its supply chains.

145 European Commission, *Minimising the Risk of Deforestation and Forest Degradation Associated with Products Placed on the EU Market* (Brussels, November 17, 2021), 57, https://ec.europa.eu/environment/system/files/2021-11/SWD_2021_326_1_EN_impact_assessment_part1_v4.pdf.

146 Karen Hansen-Kuhn, "Carbon Tariffs and Fertilizers: Wrong Fit for Purpose," October 28, 2021, <https://www.iatp.org/carbon-tariffs-and-fertilizers-wrong-fit-purpose>.



On the other hand, a diet shift and higher demand for organic products could create economic opportunities for (African) producers to supply plant-based proteins and organically produced commodities.

An expansion of Europe's organic food market might create significant opportunities for international suppliers of organically produced basic agricultural products that are needed for European food production. Exporters of plant-based protein sources, such as pulses (e.g., chickpeas, lentils, and beans) could benefit from a diet shift away from animal-based proteins as the European supply response is expected to lag growing demand. Due to the geographic proximity, and the need to shorten supply chains to reduce CO₂ emissions, African suppliers could be well positioned to tap into these opportunities that would need to be enabled through joint investment and innovation models, and better cooperation across the value chain.

EU food exports with improved nutritional content could have health benefits along the downstream value chain if they remain affordable. To further reduce environmental and social footprints, local production needs to be enhanced in currently import- and export-dependent regions

Europe should dismiss industrial food production that leads to surplus as well as food export and instead concentrate on redesigning its agricultural sector and food production, so it can be self-sufficient in producing sustainable and local food. However, until LIC are not food-import dependant and have built up their local production, EU food exports could contribute to improved access to healthy food and reduce hidden costs related to the currently negative health impacts of diets internationally. This improvement can occur if the European food system is redesigned in a way that favours the production of healthier foods. A precondition would be to keep these exports affordable for international markets. To really reduce environmental and social footprints, local production in low-income countries would need to be enhanced, e.g., through development cooperation programmes that support the development of sustainable intensification practices that increase yields, optimise land use, and promote regenerative agriculture.

3.3 INTERMODAL MOBILITY

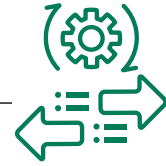



FIGURE 9

Overview of intermodal mobility ecosystem


Status Quo				
<p>10 HIC economies responsible for half of global transport CO₂ emissions</p>	<p>EU is top exporter of new vehicles (including trucks) supplying inefficient, linear use and little resilience to demand changes</p>	<p>EU's private exports in the informal second-hand market directly influence use phase emissions and waste accumulation outside of the EU with potential loss of valuable raw materials due to uncontrolled treatment after disposal</p>	<p>EU's production of vehicles uses carbon-intensive and deforestation-linked imported resources</p>	<p>Transport of EU citizens and goods causes pollution worldwide</p>



System Change Compass vision for the EU


- Reduced need for motorised trips
- Reduced energy consumption through electrification of vehicles, better energy efficiency, and sustainable fuels for aviation and shipping
- Maximised utilisation per vehicle and trip for freight and passengers
- Intermodal shift towards public transport in urban and intercity connections

International implications and opportunities of an EU System Change Compass transition




DECREASE OF EU IMPORTS FOR SPECIFIC PRODUCTS

Lower virgin material demand in (primary) **aluminium, steel, rubber,** and **mineral oil** in Europe could result in (temporary) economic losses for current trade partners in LIC and MIC




BARRIERS THROUGH STRICTER STANDARDS

The use of low-carbon fuels for shipping and aviation will require international ports and airports to be equipped with the respective fuelling **infrastructure**



INCREASE OF EU IMPORTS FLOWS OF SPECIFIC MATERIALS

Increased electrification and the introduction of alternative fuels will increase EU demand for **raw materials used for batteries and low-carbon (syn)fuels, such as cobalt, copper, hydrogen, and ammonia** potentially leading to economic opportunity for LIC/MIC but the risk of reinforcing inhumane working conditions in extracting countries



FEWER NEGATIVE IMPACTS BY EU EXPORTS

Fewer EU exports of **new and used fossil fuel cars** might benefit the transition/leapfrogging of mobility systems in other regions, but only if the necessary infrastructure for **electrification** and **inter-modality** can be developed promptly; in the short term, it might leave a gap in meeting mobility needs elsewhere

Definition of the economic ecosystem

The intermodal mobility economic ecosystem encompasses all different forms of land, sea, and air mobility and the transportation of people as well as goods. It meets the societal need for the transport of individuals and goods.

Status quo of international dynamics

*Most people in LIC still lack access to safe and affordable transport, while 10 high- and middle-income economies are currently responsible for half of global transport CO₂ emissions.*¹⁴⁷

Transport infrastructure is crucial for economic development, access to education, and to health services. However, today more than a billion people across the globe lack access to transport services.¹⁴⁸ In many LIC, poorer people are forced to rely on expensive mini-buses that tend to be unfit for the road, and 93% of the 1.35 million deaths from road accidents annually occur in developing countries.¹⁴⁹ At the same time, the current mobility system in high- and middle-income countries is responsible for a quarter of global CO₂ emissions and is highly inefficient with regard to resource use, mainly because those systems strongly rely on individual mobility and the utilisation rate of private cars (i.e., the time they are actually moving at capacity) is extraordinarily low, standing at only 2% on average in Europe.¹⁵⁰

The EU is the world's top exporter of new vehicles (passenger cars, trucks, and buses), and an additional one third of vehicles are exported privately in the informal second-hand market; European production therefore directly influences use phase emissions and waste accumulation outside of the EU.

European countries sold the highest dollar-value worth of vehicles exported during 2020 with shipments totalling USD 351 billion or 55% of international car sales.¹⁵¹ For the EU, car exports account for some 6.3% of all export trade flows.¹⁵² And this is just new cars. Approximately a third of all de-registered used vehicles in the EU are unofficially exported as second-hand cars instead of being dismantled in the EU.

Top destinations of new car exports are the UK, the US, Norway, and China.¹⁵³ Petrol and diesel cars still account for the vast majority (86%) of extra-EU car exports.¹⁵⁴ While these exports, in combination with stricter EU emission standards, contribute to the global proliferation of emission-regulated vehicles, this positive effect is undermined by the sheer quantity of exported fossil fuel vehicles which reinforces the path dependency of unsustainable mobility systems in other regions of the world.

In terms of private exports of end-of-life vehicles in the informal second-hand market, it is estimated that over a quarter of these vehicles are currently sent to Africa, where Libya, Nigeria, and Ghana are the top destinations. They are generally of low quality, i.e.,

147 Shiyang Wang and Mengpin Ge, "Everything You Need to Know About the Fastest-Growing Source of Global Emissions: Transport," October 16, 2019, <https://www.wri.org/insights/everything-you-need-know-about-fastest-growing-source-global-emissions-transport>.

148 Pawan Goenka, "How Can Emerging Economies Navigate the Mobility Transition?," January 16, 2020, <https://www.weforum.org/agenda/2020/01/how-can-emerging-economies-navigate-the-mobility-transition/>.

149 World Bank, "Transport Overview," accessed January 11, 2022, <https://www.worldbank.org/en/topic/transport/overview#1>.

150 SYSTEMIQ and Club of Rome, *A System Change Compass. Implementing the European Green Deal in a Time of Recovery.*"

151 Daniel Workman, "Car Exports by Country 2020," accessed January 11, 2022, <https://www.worldstopexports.com/car-exports-country/>.

152 Eurostat, "International Trade in Goods by Type of Good," accessed January 17, 2022, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_in_goods_by_type_of_good.

153 ACEA, "EU Motor Vehicle Exports, Top 10 Destinations (by Value)," October 4, 2021, <https://ec.europa.eu/eurostat/de/web/products-eurostat-news/-/ddn-20210524-1>.

154 Eurostat, "Trade in Electric and Hybrid Electric Cars on the Rise," May 24, 2021, <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210524-1>.the European Union (EU)

usually do not have a valid roadworthiness certificate, and emission systems (catalytic convertor and diesel particulate filter) are below current European standard. This leads not only to high emissions of particulate matter, NO_x, CO₂, and risks to health and the environment, it also means a potential loss of valuable raw materials due to uncontrolled treatment after disposal.¹⁵⁵

The EU production of vehicles uses significant amounts of carbon-intensive and deforestation-linked resources, such as aluminium, steel, and rubber, large shares of which are imported.

The European automotive industry accounts for over 80% of rubber, 25% of aluminium, and about 15% of steel consumption in the EU. For these commodities, trade flows are currently highly globalised. In fact, almost half of the EU's total aluminium demand (most of it coming from Norway, Iceland, and Russia, as well as UAE and Mozambique), a quarter of its steel demand (mainly imported from Turkey, Russia, South Korea, and Ukraine), and all its demand for primary rubber (with key origins in Southeast Asia)¹⁵⁶ are covered by international imports.

Both steel and aluminium production are linked to significant carbon emissions, and together, they account for about 10% of global GHG (greenhouse gas) emissions.¹⁵⁷ Unlike in the construction sector, steel for the automotive industry relies more heavily on primary material rather than recycled material because steel for vehicle production needs to be free of (even minimal) contamination by other materials. Technologies that lower the carbon footprint of primary steel production are therefore crucial

for this economic ecosystem, but have not scaled yet in, or outside, the EU. The carbon intensity of aluminium production is linked to both its energy intensity and to process emissions. While Europe's top trading partners in aluminium can use their large hydropower supplies to cover most of its production with renewable energy, process emissions from aluminium production are still high. In Iceland, for instance, they make up 30% of the country's total GHG emissions.¹⁵⁸ The production of natural rubber—which is considered a critical raw material for the EU economy—is linked to deforestation and biodiversity loss in Southeast Asia, especially in Indonesia and Thailand.¹⁵⁹

Even though the “direct” emissions of cars through combustion engines will decline due to the electrification of vehicles, there are still significant GHG emissions entrenched in this industry: Embedded CO₂ emissions from the extraction and processing of materials are gaining importance as a source of CO₂ emissions for the automotive industry.

Shipping and aviation are highly globalised, and EU-related passenger and freight transport account for significant amounts of GHG emissions and pollution beyond European borders.

Due to current globalised trade patterns, about 60% of the ships calling at EU ports are either arriving from or heading to non-European countries. In a global context, European economic activity is responsible for one fifth of the CO₂ emissions of international shipping.¹⁶⁰ In addition, European shipowners control 37% of the global merchant fleet and operate shipping services all around the world

155 European Commission, “Market Overview,” accessed January 11, 2022, <https://www.european-aluminium.eu/activity-report-2019-2020/market-overview/>.

156 European Commission.

157 Steel production is responsible for 8%, and aluminium for 2% of global GHG emissions: Hoffmann, Van Hoey, and Zeumer, “Decarbonisation Challenge for Steel”; Renee Van Heusden, Harry Morrison, and Mary Puleo, “Why Addressing the Aluminum Industry's Carbon Footprint Is Key to Climate Action,” December 16, 2020, <https://www.greenbiz.com/article/why-addressing-aluminum-industrys-carbon-footprint-key-climate-action>.

158 Iceland Monitor, “Iceland's CO₂ Emissions Could Be Reduced by a Third,” accessed January 11, 2022, <https://icelandmonitor.mbl.is/news/news/2020/06/24/iceland-s-co2-emissions-could-be-reduced-by-a-third/>.

159 Mighty Earth, “Why Rubber Must Be Kept in the EU's Anti-Deforestation Law,” October 25, 2021, <https://www.mightyearth.org/2021/10/25/why-natural-rubber-must-be-kept-in-the-eus-anti-deforestation-law/>.

160 Martin Cames et al., *Integration of Maritime Transport in the EU Emissions Trading System* (Berlin/Brussels: Öko-Institut e.V. and Transport & Environment, July 2021), 7-11, <https://www.oeko.de/fileadmin/oekodoc/Integration-of-maritime-transport-in-EU-ETS.pdf>.

(although only 18% are registered under the flag of an EU member state).¹⁶¹ They not only contribute to GHG emissions beyond EU borders, but also to increased underwater noise, air, and water pollution, and the introduction of non-indigenous species in international seas. Many of these ships are dismantled in ship recycling facilities located outside the EU, some of which operate under poor environmental standards and safety conditions. To avoid having to comply with stricter EU recycling standards, EU member states flagged ships may be flagged out to registries in third countries. Similarly, the flights departing the EU and arriving in a non-EU country emitted over 10% of CO₂ from aviation in 2019.¹⁶² Aviation has been the fastest-growing source of GHG emissions, and low-carbon fuels for aviation are still in their infancy.

Potential effects of a System Change Compass transition on international trade relations

The SCC (2020) made specific recommendations on how to achieve a systemic transformation of the mobility system towards intermodal mobility. It recommended reducing the need for motorised trips, for instance by adjusting urban planning, promoting teleworking, and shortening supply chains; reducing the energy intensity and consumption of fossil fuels through the electrification of vehicles, and energy-efficiency and sustainable fuels for aviation and shipping; maximising the utilisation per vehicle and trip for freight and passengers by expanding urban and intercity public transport, enabling infrastructure; and prioritising and utilising the medium of transport that is easiest to electrify, e.g., train over planes.

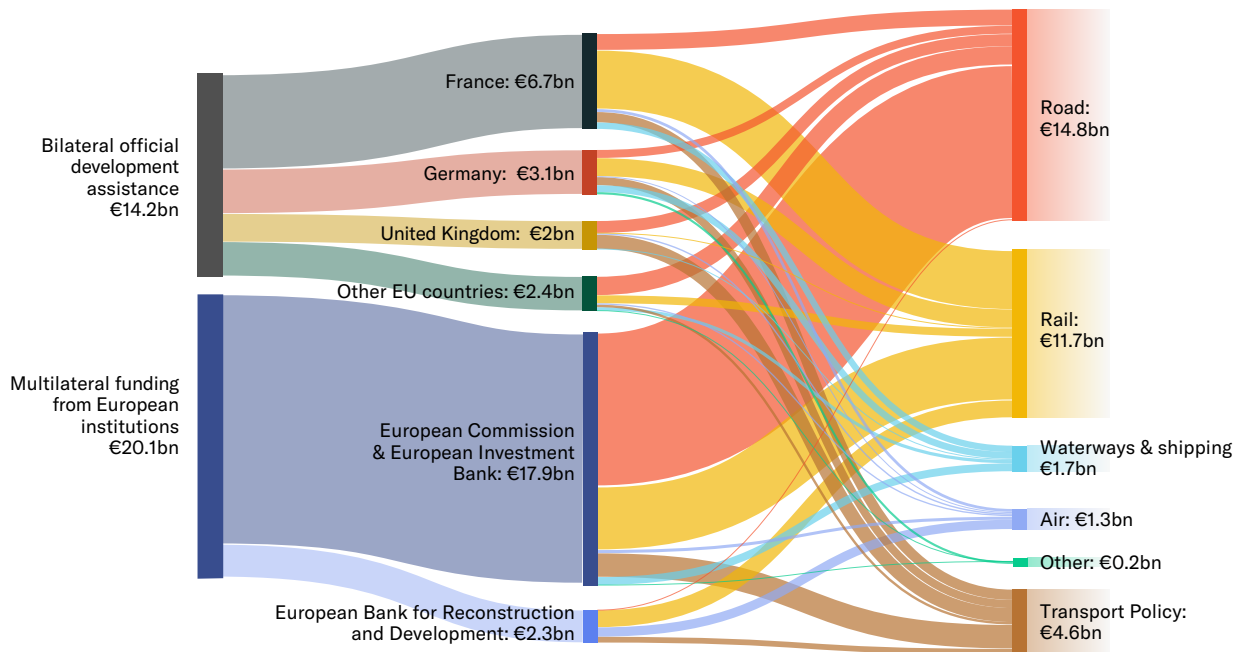
Fewer EU exports of new and used fossil fuel cars might benefit the transition/leapfrogging of mobility systems in other regions, but only if the necessary infrastructure for electrification and intermodality can be developed promptly. In the short term, fewer exports might leave a gap in meeting mobility needs elsewhere.

Taking responsibility for the environmental impact on international downstream supply chains means that the EU automotive industry should lower its production and exports of petrol and diesel cars, and that private exports of end-of-life vehicles should be significantly reduced. Instead, the focus should be on circular modules and services to supply clean, fair, inter-modal mobility systems. However, this could, in the short term, have unintended negative effects on former export destinations: It could trigger demand for petrol cars from other producing countries which have potentially less strict emissions regulations, and emissions could increase. On the other hand, a halt to the exports of end-of-life vehicles to poorer countries would mean that mobility needs are not being met if there is no timely alternative. Consequently, for this change to have a positive effect, these countries/regions outside of the EU would need to quickly develop or expand the necessary infrastructure for a more electrified and intermodal mobility system and the EU should provide necessary funding and investment instead of investing in the development of linear mobility based on fossil fuels. With the exception of rail electrification, much of the EU's and UK's transport investment in the years 2014-2021 funded the expansion of carbon-emitting transport to facilitate trade and productivity, rather than decarbonise transport:¹⁶³

161 European Maritime Safety Agency, "European Maritime Transport Environmental Report (EMTER)," accessed January 11, 2022, <http://emsa.europa.eu/emter.html>.

162 Brandon Graver, Dan Rutherford, and Sola Zheng, *CO₂ Emissions from Commercial Aviation: 2013, 2018, and 2019* (Washington, DC: International Council on Clean Transportation, October 2020), 12, <https://theicct.org/sites/default/files/publications/CO2-commercial-aviation-oct2020.pdf>.

163 Jonathan Essex, Peter Sims, and Joseph Eastoe, *Global Public Investment Requirements for Zero Carbon Rethinking International Climate Finance, Aid and Transport Investment* (The Green European Foundation and Green House Think Tank, October 2021), 12, https://gef.eu/wp-content/uploads/2021/11/FINAL_Global_Public_Investment_Requirements_for_Zero_Carbon.pdf.

FIGURE 10**Breakdown of bilateral and multilateral European global public investment**

Source: The Green European Foundation and Green House Think Tank (2021), *Global Public Investment Requirements for Zero Carbon*.¹⁶⁴

Decreased demand for resources, such as (primary) aluminium, steel, rubber and mineral oil, and the need to meet remaining demand with lower-carbon and deforestation-free materials, could result in (temporary) economic losses for current trade partners.

A reduced number of motorised trips, maximal utilisation per vehicle, and a shift towards public modes of transport in the EU will result in decreased demand for, and therefore lower production of, cars. This will likely decrease the overall demand for imported materials used for vehicle production, such as steel, aluminium, and rubber. Similarly, the electrification of transport will result in a decline in demand for fossil energy (the majority of which is currently being supplied to the EU by Russia).

For some materials, particularly aluminium, a decreasing demand for manufacturing automotive parts might be balanced by an increasing demand for other uses, such as batteries and renewable energy infrastructure. However, imported aluminium will still need to have a lower CO₂ footprint, which means that exporting countries might need to adapt their production using the latest available technology or suffer economic losses. This is a particular challenge for countries with low economic diversification; for instance, aluminium represents 30% of Mozambique's exports, with the EU currently being the top destination for supply.¹⁶⁵ Hence, joint investments across value chains should be devised now to enable key trade partners to participate the transitions.

¹⁶⁴ Essex, Sims, and Eastoe.

¹⁶⁵ Trend Economy, "Annual International Trade Statistics by Country (HS02)," November 14, 2021, <https://trendeconomy.com/data/h2/Mozambique/76>.



Increased electrification of vehicles, and the introduction of alternative fuels for shipping and aviation will increase demand for raw materials used for batteries and low-carbon (syn)fuels, such as cobalt, copper, hydrogen, and ammonia.

An increased share of electric vehicles and the use of sustainable fuels for shipping and aviation will require large quantities of resources used to produce batteries, synfuels, and other low-carbon fuels. In particular, larger supplies of green hydrogen, nickel, manganese, cobalt, copper, and rare earths will be necessary. For some of these materials, EU companies are fully import-dependent (e.g., rare earth materials, cobalt); for others, the EU does not have the necessary capacities to produce the quantities needed (e.g., green hydrogen/ammonia, and renewable energy needed for producing it), and will need to import them to meet the remaining demand. It is of utmost importance that all efforts work towards minimising the impact of these materials and do not substitute the EU's dependency on fossil energy with its dependency on rare earths, as both have serious detrimental impacts on the

environment. A significant economic opportunity lies in the innovation for circular rare materials and the necessary infrastructure. This is bound to be a major market with global demand, so both European and supply-country intelligence and infrastructure can benefit from this.

The use of low-carbon fuels for shipping and aviation will require international ports and airports to be equipped with the respective fuelling infrastructure.

Different technologies and alternative fuels are being explored to enable the decarbonisation and dematerialisation of aviation and shipping. Synthetic fuels for aviation, and the use of hydrogen/ammonia to fuel ships are amongst the most promising options. However, even if the EU drives the development and scaling of these sustainable fuels, a major challenge lies in their widespread deployment, given the globalised nature of current freight and passenger transport. Consequently, airport and port infrastructure would need to be adapted not only in the EU, but on an international scale as well.

3.4 CONSUMER GOODS



FIGURE 11

Overview of consumer goods ecosystem



Definition of the economic ecosystem

The consumer goods economic ecosystem meets daily functional needs other than those already met by the previous ecosystems (nutrition, housing, mobility). It encompasses, for instance, clothing, cosmetics and hygiene products, electronic devices, and packaging of these consumer goods. In short, it encompasses all the products that surround human beings and enable them to meet their functional needs. It does not, however, include education, health, and artistic production.

Status quo of international dynamics

For most consumer goods, the environmental and social burden of production occurs in producer countries, as the EU is a net importer.

The predominant pattern of international dynamics in consumer goods is an externalisation of environmental and social costs to countries outside of the EU: For instance, more than 90% of the water and land use, and 75% of GHG emissions related to the EU consumption of textiles occurs outside

of the EU,¹⁶⁶ as the EU imports mainly finished textile products from Asia (worth EUR 109 billion imports, almost three quarters of which come from China, Bangladesh and Turkey). Similarly, in the electronics industry, 85% of GHG emissions and 90% of air pollutant emissions are generated along international supply chains.¹⁶⁷ The mining of most important critical raw materials has a high environmental hazard potential and high pollution risk at the mining sites in China, Democratic Republic of the Congo, Rwanda, and the US.¹⁶⁸

At the same time, European retailers currently benefit from an ongoing increase in demand for consumer goods in the EU.¹⁶⁹ Europe-based fashion retail companies, such as the fast-fashion giant Inditex, with a revenue of EUR 28.2 billion pre-pandemic,¹⁷⁰ rank among the top financial performers.¹⁷¹ Europe is the third-largest market for electronics and media in the world with revenues of EUR 72 billion in 2019, and an estimated average growth rate of up to 7% p.a. until 2024 (pre-pandemic estimate), mainly driven by consumer electronics sales.¹⁷² Computer and electronic products are among the top two EU import product categories (13% of total imports).¹⁷³

166 Maarten Christis et al., *Textiles and the Environment in a Circular Economy* (European Environmental Agency and European Topic Centre Waste and Materials in a Green Economy, November 2019), 20-22, <https://www.eionet.europa.eu/etcs/etc-wmge/products/etc-wmge-reports/textiles-and-the-environment-in-a-circular-economy>.

167 Jungmichel et al., *Atlas on Environmental Impacts - Supply Chains-Environmental Impacts and Hot Spots in the Supply Chain* (Berlin/Hamburg: adelphi/Systain, 2017), 22-23, <https://www.adelphi.de/en/publication/atlas-environmental-impacts-supply-chains>.

168 John Bachér et al., *Environmental Aspects Related to the Use of Critical Raw Materials in Priority Sectors and Value Chains* (European Environmental Agency and European Topic Centre Waste and Materials in a Green Economy, 2020), 70-72.

169 E.g., Fast Fashion: *The World Trade Statistical Review 2020* of the World Trade Organisation describes the EU as the world's largest importer of apparel and textiles. It accounted for 21.3% of the world's apparel and textile imports value in 2019. Before 2020, the overall European apparel market grew by an average annual rate of 4.7% from 2016 to 2019. McKinsey's *State of Fashion 2021* predicts that the global apparel industry would return to 2019 levels of activity by the third quarter of 2022 in an early recovery scenario, and by the fourth quarter of 2023 in the late recovery scenario; "What Is the Demand for Apparel on the European Market?," November 22, 2021, <https://www.cbi.eu/market-information/apparel/what-demand#which-products-from-the-developing-countries-have-the-most-potential-on-the-european-apparel-market>.

170 Inditex, "Financial Data Inditex," accessed January 11, 2022, <https://www.inditex.com/investors/investor-relations/financial-data>.

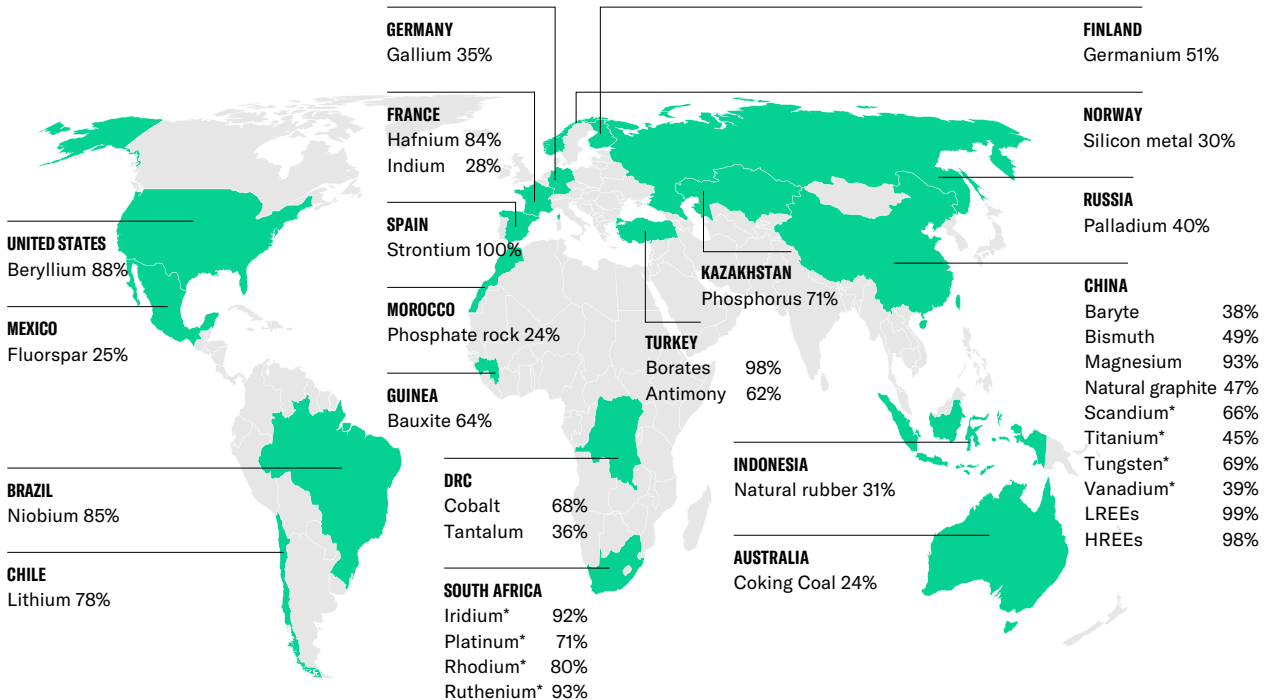
171 Mahsa Mahsa, "Fast Fashion in Europe - Statistics & Facts," April 20, 2021, <https://www.statista.com/topics/6088/fast-fashion-in-europe/#dossierKeyfigures>.

172 Bachér et al., "Environmental Aspects Related to the Use of Critical Raw Materials in Priority Sectors and Value Chains," 69.

173 European Commission, "Main Goods in Extra-EU Imports," accessed January 11, 2022, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Main_goods_in_extra-EU_imports.

FIGURE 12

Biggest supplier countries of critical raw materials to the EU



* share of global production

Source: European Commission report on the 2020 criticality assessment¹⁷⁴

E-waste and fast-fashion waste generated through Europe's overconsumption is exported to third countries, causing hazardous environmental pollution and health risks.

Not only the production burdens, but also the end-of-life hazards of consumer products used in the EU are externalised: Electronic waste and discarded fast fashion products are shipped to African and Asian countries (since China's ban in 2018, Southeast Asia is the new key destination for e-waste), creating serious health risks and environmental damage in

these regions. In total, Europe exported 11.6 million tonnes in e-waste in 2017.¹⁷⁵ Weak enforcement of existing regulations (such as the Waste from Electrical and Electronic Equipment (WEEE) Directive¹⁷⁶ and the Basel Convention) has resulted in illegal exports of significant amounts of e-waste to low-income countries that do not have the necessary capacities for refurbishing or recycling, such as Ghana, Nigeria, and Thailand.¹⁷⁷ In fact, 80% (40 million tonnes) of the total e-waste generated by the global economy every year (50 million tonnes) is

174 European Commission, *Study on the EU's List of Critical Raw Materials – Final Report*, 2020, <https://ec.europa.eu/docsroom/documents/42883/attachments/1/translations/en/renditions/native>.

175 Angaindrankumar Gnanasagaran, "E-Waste Chokes Southeast Asia," Basel Action Network, November 5, 2018, <https://www.ban.org/news/2018/11/5/e-waste-chokes-southeast-asia>.

176 European Commission, "Waste from Electrical and Electronic Equipment (WEEE)," accessed January 11, 2022, https://ec.europa.eu/environment/topics/waste-and-recycling/waste-electrical-and-electronic-equipment-weee_de.

177 The Basel and Action Networks, "The Illegal WEEE Trade from Europe to Developing Countries," accessed January 11, 2022, <http://www.innoweee.eu/flex/cm/pages/ServeBLOB.php/L/EN/IDPagina/36>.

discarded in landfills, burned, or illegally traded and treated in a substandard way.¹⁷⁸

The e-waste problem could expand into a global health crisis, largely affecting urban areas. (Informal) workers on the landfills are exposed to toxic compounds that are carcinogenic. Toxic elements are found in the blood-streams of informal workers at dumping grounds for e-waste where open burning is used to harvest metals. These dumps have become economic hubs in their own right, attracting food vendors, and are often adjacent to informal settlements, leading to further contamination from the toxic fumes. E-waste can contaminate groundwater, soil, and air.¹⁷⁹ Women and girls, who make up 30% of the informal workforce, are also in danger of miscarriages, birth defects in their children, and infant mortality.¹⁸⁰

Similarly, landfills overflowing with discarded fast fashion products cause environmental and health crises: The Ghanaian city Accra, for example, experiences major floods that are exacerbated by clothing waste clogging the gutters and preventing drainage, which increases the risk of malaria and cholera.¹⁸¹ Fires in the landfills cause air pollution

and explosion risks, and large bubbles of methane can be trapped.¹⁸² Fast fashion contains toxic compounds, and the phosphates, chlorinated solvents, non-degradable surfactants, and synthetic fibres can take up to 200 years to decompose, leaking microplastic in the natural environment and/or creating toxic fumes while burning.¹⁸³

At the same time, the export of e-waste, combined with already low collection rates, means that secondary material needed for a real circular economy in the EU is rare. Currently, less than 40% of Europe's e-waste is recycled.¹⁸⁴

There is a high economic dependence of a few individual countries (Bangladesh, Cambodia and Myanmar, and increasingly African countries, e.g., Kenya) on textile exports to the EU.

Bangladesh is the world's second largest exporter of clothing and textiles after China. In fact, the sector represents almost 90% of the country's exports,¹⁸⁵ and more than 4.5 million Bangladeshis work in the textile industry—the vast majority of them women.¹⁸⁶ Europe is the top importer of these products, as Bangladesh supplies more than 56% of its clothing exports to the EU. Another major source of European

178 World Economic Forum in support of the United Nations E-waste Coalition, *A New Circular Vision for Electronics Time for a Global Reboot*, January 2019, 9, https://www3.weforum.org/docs/WEF_A_New_Circular_Vision_for_Electronics.pdf.

179 Fannie Machete, "Environmental Health Risks Associated with E-Waste Exposure in Badplaas, Carolina and Elukwatini Landfills, Republic of South Africa," *African Journal of Science, Technology, Innovation and Development* 9, no. 6 (November 2, 2017): 679–84, <https://doi.org/10.1080/20421338.2017.1355602>.

180 World Economic Forum in support of the United Nations E-waste Coalition, *A New Circular Vision for Electronics Time for a Global Reboot*, 13.

181 Jo Lorenz, "Decolonising Fashion: How an Influx Of 'Dead White Man's Clothes' Is Affecting Ghana," August 4, 2020, <https://eco-age.com/resources/decolonising-fashion-dead-white-mans-clothes-ghana/>.

182 Linton Besser, "'Dead White Man's Clothes': The Dirty Secret behind the World's Fashion Addiction," *ABC News*, October 21, 2021, <https://www.abc.net.au/news/2021-08-12/fast-fashion-turning-parts-ghana-into-toxic-landfill/100358702>.

183 S Aishwariya and J Jaisri, "Harmful Effects of Textile Waste," June 2020, <https://www.fibre2fashion.com/industry-article/8696/harmful-effects-of-textile-waste>.

184 European Commission, "E-Waste in the EU: Facts and Figures (Infographic)," December 23, 2020, <https://www.europarl.europa.eu/news/en/headlines/society/20201208STO93325/e-waste-in-the-eu-facts-and-figures-infographic>.

185 Berg et al., "What's next for Bangladesh's Garment Industry, after a Decade of Growth?"

186 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), "Bangladesh: Producing Socially-Conscious and Eco-Friendly Clothing," accessed January 11, 2022, <https://www.giz.de/en/workingwithgiz/11859.html>.

textile imports is Cambodia, where the sector accounts for 11% of the GDP and employs a tenth of the domestic workforce.

The production of the fast fashion industry is also growing quickly in Africa: The second-largest sector after agriculture in Africa is the fashion and textile industry with an estimated market value of USD 31 billion in 2020, and consistent growth rates.¹⁸⁷ Africa is seen by some voices as “the world's new low-cost factory.”¹⁸⁸

The significant market power of European and North American retailers results in precarious working conditions in producer countries as manufacturers operate on thin margins to compete.

The abovementioned dependence of producers in low-income countries on retailers in high-income countries often translates into precarious labour conditions because the strong competition between producers incentivizes them to keep production costs exceptionally low. For example, the monthly wage for an employee in clothing production in Bangladesh and Myanmar in 2018 was USD 95, and only USD 26 in Ethiopia.¹⁸⁹ To meet demand during the peak seasons and to keep costs low, garment workers are forced to work up to 16 hours per day, seven days a week, resulting in 96-hour work weeks without overtime pay. Working environments often do not meet health standards, lacking ventilation, and exposing workers to toxic substances and fibre dust.¹⁹⁰ Crucial safety standards are often disregarded, leading to deadly catastrophes like the collapse of the Rana Plaza garment factory building which killed 1,134 people in Bangladesh in 2013.¹⁹¹

Potential effects of a System Change Compass transition on international trade relations

The *SCC (2020)* made specific recommendations on how to achieve a systemic transformation of the European consumer goods ecosystem. It focused on minimising the overall need for energy-intensive and difficult-to-recycle (virgin) materials, establishing a policy environment and business practices that increase and retain the use-value of products with consumers, and decrease material consumption at the consumer level. To achieve this, the EU will need to implement policies that promote improved product design for reuse, repairability and recyclability, longer product lifetimes, higher market shares of products-as-a-service and waste-free products, an increased use of secondary material, and more localised value chains.

A decrease in demand for imported consumer goods such as electronics and textiles could pose a major socioeconomic challenge to countries dependent on exporting to the EU; in the short term, it could drive down profits for producers and further exacerbate already precarious working conditions.

In countries with low economic diversification, the focus on producing and exporting consumer goods to European markets, as with fast fashion produced in Bangladesh and Cambodia, has created a high dependency on European demand. These countries are likely to be severely affected by a reduction in the per capita consumption of goods in the EU. A slump in demand could lead to economic shocks and job losses, resulting in substantial socioeconomic

187 Sara Yamama, “Fast Fashion in Africa,” *Infomineo* (blog), February 15, 2021, <https://infomineo.com/fast-fashion-in-africa/>.

188 Aspen Institute Italia, “Africa Is Set to Be the New Fast-Fashion Factory. Interview with Maurizio Bussi,” July 19, 2016, <https://www.aspeninstitute.it/en/national-interest/article/africa-set-be-new-fast-fashion-factory-interview-maurizio-bussi>.

189 Statista, “Where Pay Is Lowest for Cheap Clothing Production,” May 7, 2019, <https://www.statista.com/chart/17903/monthly-minimum-wage-in-the-global-garment-industry/>.

190 Sustain Your Style, “What’s Wrong with the Fashion Industry?,” June 24, 2021, <https://www.sustainyourstyle.org/en/whats-wrong-with-the-fashion-industry#anchor-working-conditions>.

191 International Labour Organisation, “The Rana Plaza Accident and Its Aftermath,” December 21, 2017, http://www.ilo.org/global/topics/geip/WCMS_614394/lang--en/index.htm.



challenges, as alternative employment is rare. In already precarious sectors such as textiles, decreasing demand could increase the competition between producers and give purchasers an even stronger bargaining position. This might further exacerbate working conditions as producers will want to lower costs even more.

Sustainable product standards could improve the environmental and social footprint along the value chain but might act as de facto trade barriers in the short term; major improvements in transparency and pricing will be necessary to leverage positive impacts of standards.

Even if consumption levels are lowered in the EU, international trade will continue to be necessary to meet European demand. Standards that aim at improving the circularity of products (e.g., the Eco-design Directive) can reduce waste generation and lower the current negative impacts of waste exports. However, close collaboration along the whole value chain will be crucial to improve the

design for longevity and recyclability, and the reduction of packaging for consumer goods.

Standards that focus on the upstream environmental and social footprint in producer countries have the potential to internalise previously externalised environmental and social impacts, such as labour and human rights violations, and high “embedded” water use; however, this might require a significant adjustment of prices paid to producers along the upstream value chain. Compliance with these standards is also likely to pose particular transparency challenges in the consumer goods ecosystem due to the complexity of supply chains.

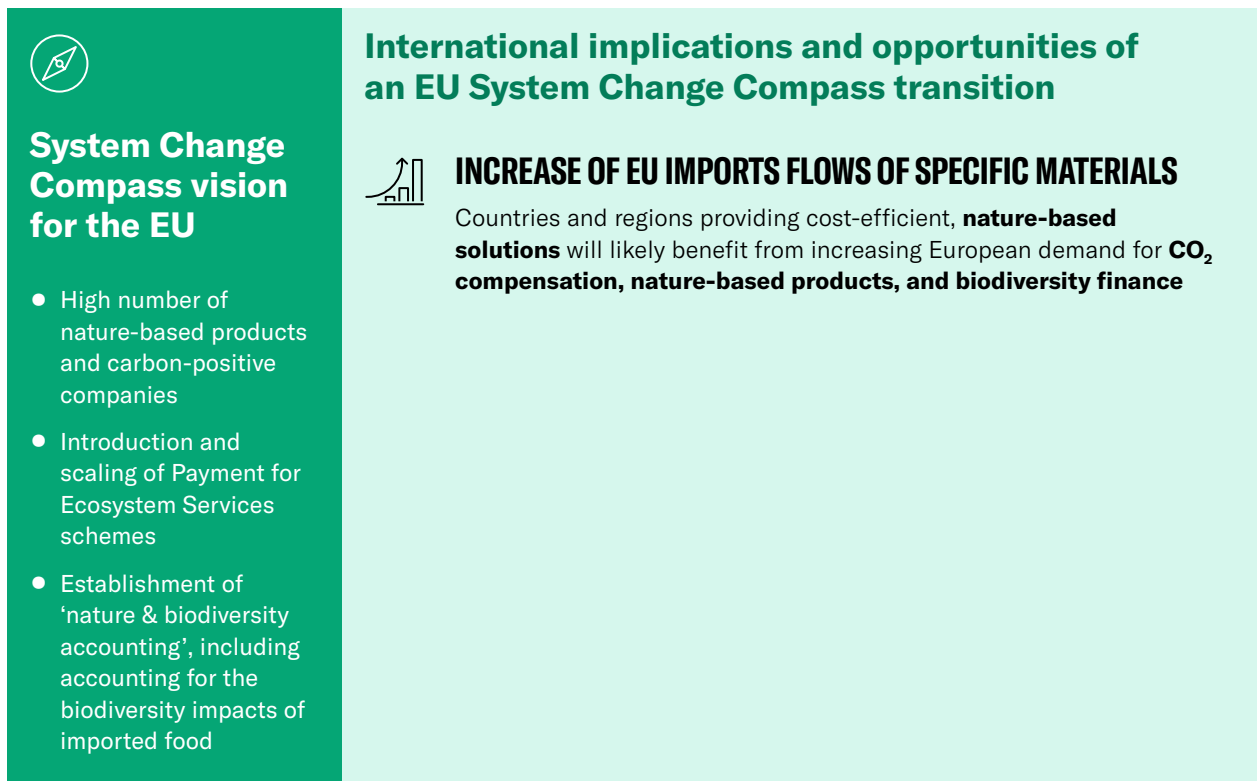
In the short term, product standards could act as de facto trade barriers, benefitting producers in non-EU countries that have a similar legislation in place (e.g., USA, Australia, Brazil, China, Japan, and the US for eco-design standards) and putting producers that do not at a disadvantage.

3.5 NATURE-BASED



FIGURE 13

Overview of nature-based ecosystem



Definition of the economic ecosystem

The nature-based economic ecosystem refers to how commons such as forests, glaciers, peatlands, and watershed areas—and the protection and restoration of these areas—support meeting fundamental societal needs such as the provision of food, water, safety, and health protection. Ecosystem services such as the pollination of plants, provision of habitats for migratory species, water purification, retention and storage, soil formation processes, nutrient cycling, the release of vital oxygen, reduction of carbon emissions, regulation of the climate, and protection against extreme weather events are at the heart of this supporting economic ecosystem.

Status quo of international dynamics

Both HIC and LIC are significantly affected by declining biodiversity and ecosystems, with agriculture-dependent LIC at particular risk.

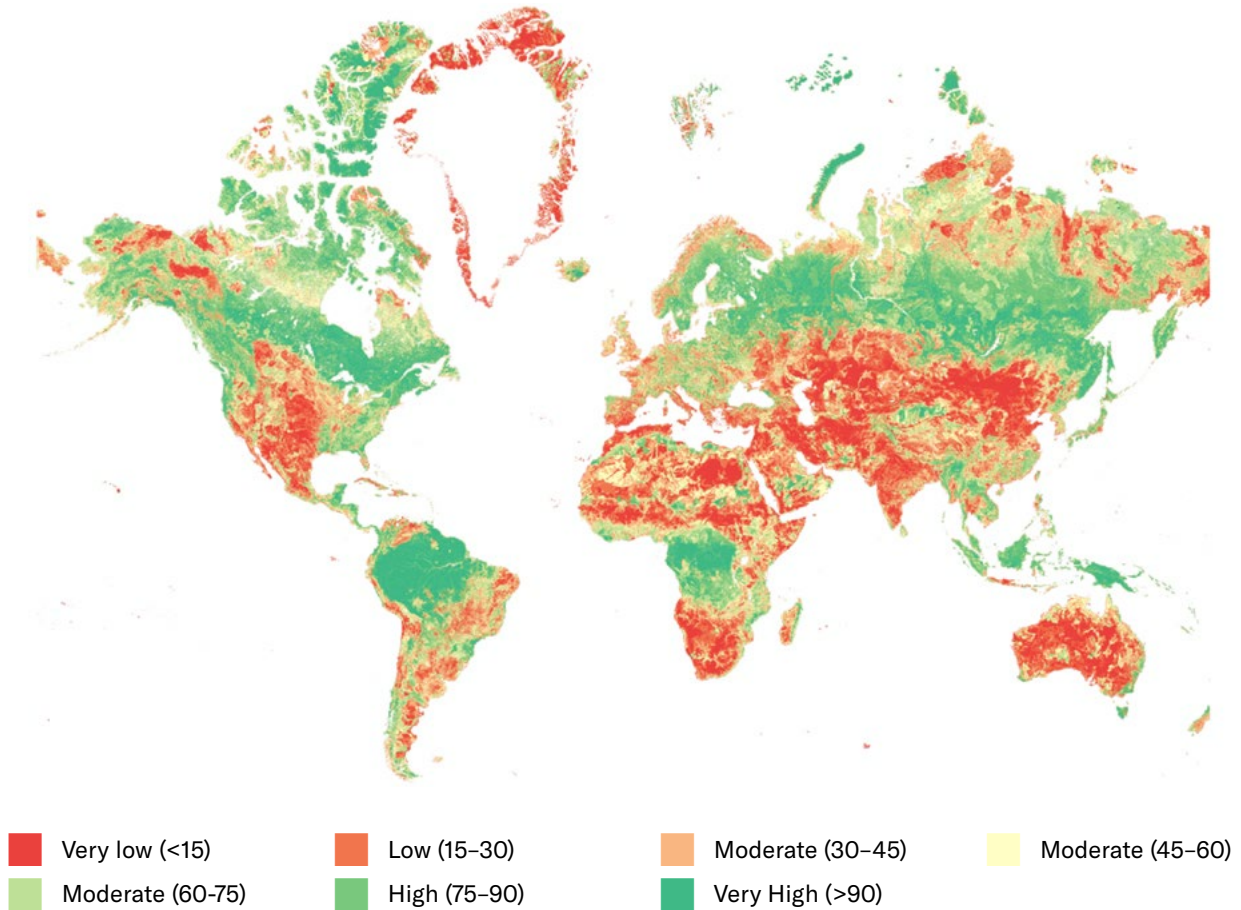
While over half (55%) of global economic value creation—equal to USD 42 trillion—is dependent on high-functioning biodiversity and ecosystem services, it is estimated that a fifth of countries globally are at risk of their ecosystems collapsing due to a decline in biodiversity and related beneficial services.¹⁹² According to the Swiss Re Institute’s Biodiversity and Ecosystem Services (BES) Index,¹⁹³ which shows ecosystems relevant to a given location and their health status, this analysis is true for both LIC and HIC. However, resource-rich LIC that have a heavy dependence on agricultural sectors (such as Indonesia, Kenya, Nigeria, Pakistan, and Vietnam) are found to be particularly susceptible to shocks from biodiversity and ecosystem issues when critical tipping points are reached.¹⁹⁴ In the EU, more than half of the societal demand for essential ecosystem services (e.g., pollination) is currently not met by ecosystems.¹⁹⁵ As the IPCC states, maintaining the resilience of biodiversity and ecosystem services at a global scale depends on conservation of approximately 30% to 50% of Earth’s land, freshwater, and ocean areas.

192 Swiss Re Institute, “A Fifth of Countries Worldwide at Risk from Ecosystem Collapse as Biodiversity Declines, Reveals Pioneering Swiss Re Index,” September 23, 2020, <https://www.swissre.com/media/news-releases/nr-20200923-biodiversity-and-ecosystems-services.html>.

193 Oliver Schelske et al., *Biodiversity and Ecosystem Services: A Business Case for Re/Insurance* (Swiss RE Institute, September 24, 2020).

194 Swiss Re Institute, “A Fifth of Countries Worldwide at Risk from Ecosystem Collapse as Biodiversity Declines, Reveals Pioneering Swiss Re Index.”

195 Veronika Vysna et al., *Accounting for Ecosystems and Their Services in the European Union* (Luxembourg: Eurostat, Joint Research Centre (JRC), Directorate General for Environment (ENV), Directorate General for Research and Innovation (RTD) and European Environment Agency (EEA), 2021), 8, <https://ec.europa.eu/eurostat/documents/7870049/12943935/KS-FT-20-002-EN-N.pdf/de44610d-79e5-010a-5675-14fc4d8527d9?t=1624528835061>.

FIGURE 14**Global Swiss Re Institute Biodiversity and Ecosystem Services Index Map**

Source: Swiss Re Institute (2020), *Biodiversity and Ecosystem Services: A business case for Re/Insurance*¹⁹⁶

The EU benefits from ecosystem services provided in other areas of the world, in particular from carbon sequestration. Other ecosystem services, such as water provision and purification, soil health and pollination, are embedded in imported goods.

Some ecosystem services primarily have local benefits, such as pollination, flood control, water purification, and air filtration. In the EU, ecosystem

services are mostly provided by forests and croplands, and their total economic value has been estimated at EUR 234 billion in 2019.¹⁹⁷ For ecosystems there is a spatial mismatch between areas of provision and the areas that benefit. This is particularly relevant when it comes to carbon sequestration: From a climate protection perspective, EU ecosystems mitigate only 7% of all the EU's CO₂ emissions.¹⁹⁸ This does not only mean that healthy ecosystems in other

¹⁹⁶ Schelske et al., *Biodiversity and Ecosystem Services A Business Case for Re/Insurance*.

¹⁹⁷ Vysna et al., *Accounting for Ecosystems and Their Services in the European Union*, 40.

¹⁹⁸ Vysna et al., 38.

areas of the world are needed to absorb the rest of European carbon emissions, but these emissions also put the provision of local ecosystem services elsewhere at risk, as increasing global warming threatens to degrade ecosystems. This is particularly problematic for those ecosystems that are near the hard limits of their natural adaptation capacity, such as coral reefs and coastal wetlands that are important for flood protection in coastal areas, as well as some rainforests, and some polar and mountain ecosystems.¹⁹⁹

For many imported commodities and goods, local ecosystem services in the exporting country or region have contributed to the production. For instance, agricultural production and cotton production for textiles (while often being supported by agrochemicals and irrigation), rely on soil ecosystems in croplands as well as water provision and purification, natural pest control, and crop pollination. Since many of these ecosystem services supplied are public goods, they are often not priced into the commodities that are traded and tend to be overexploited. However, the health of these ecosystems is essential to maintain agricultural production in the long term and to ensure proper forestry conservation. In countries that rely heavily on agriculture, the preservation and restoration of these ecosystem would require economic diversification combined with dedicated conservation and preservation efforts.

Current remuneration for benefits from international ecosystem services is mainly comprised by carbon finance; while the EU is the largest demand market for international carbon credits, it does not match the actual value of benefits.

While Payments for Ecosystem Services (PES) programs, providing financial incentives for land management practices that increase the production of different ecosystem services, are used more in a domestic context, international remuneration mechanisms for ecosystem services that are public goods have mainly taken the form of (voluntary) carbon markets and other forms of carbon finance that reward GHG emission reduction projects, including nature-based solutions. This market-based approach is also increasingly used for biodiversity offsets, where conservation actions compensate for residual, unavoidable biodiversity impacts elsewhere. International financial flows related to biodiversity also comprise biodiversity-relevant ODA payments.

On voluntary carbon markets, European buyers have purchased more offsets than other regions, increasing to 63% in 2019,²⁰⁰ and compared to North American buyers, European demand is more likely to target international supply. Over half of the traded volumes of credits currently originate from projects located in Asia.²⁰¹ With regard to global financing mechanisms under international treaties, the EU Emissions Trading Scheme has been the

199 Pörtner et al., *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers*, 35.

200 Ecosystem Marketplace, "Buyers of Voluntary Carbon Offsets, a Regional Analysis - State of the Voluntary Carbon Markets 2020," accessed March 14, 2022, <https://www.ecosystemmarketplace.com/publications/buyers-of-voluntary-carbon-offsets-a-regional-analysis-state-of-the-voluntary-carbon-markets-2020-third-installment-featuring-european-and-north-american-buyers-offsets-2020/>.

201 Stephen Donofrio et al., *Market in Motion, State of Voluntary Carbon Markets 2021* (Washington DC: Forest Trends' Ecosystem Marketplace, 2021), 17, <https://www.forest-trends.org/publications/state-of-the-voluntary-carbon-markets-2021/>.

largest source of demand for certified emission reductions traded under the Clean Development Mechanism (CDM) under the Kyoto Protocol. The CDM has been criticised for problems regarding the additionality of emissions reductions leading to risks of double counting, which its successor under the Paris Agreement, the Sustainable Development Mechanism (SDM), is seeking to address. Despite increasing prices, both on the voluntary market and the government-led carbon market, prices of carbon per tonne are still considered to be too low to reach net zero by 2050 according to climate economists.²⁰²

Apart from carbon markets, Europe's contribution to international climate finance—including funds from public budgets and development financial institutions of the EU funding climate projects in low- and middle-income countries—stood at EUR 23 billion in 2020.²⁰³ In this context, there is some criticism around the preponderance of non-concessional loans over grant financing by the European Investment Bank.²⁰⁴

Overall, there is a disparity between the value of the benefits the EU and other high-income polluting countries have reaped from ecosystem services in other regions of the world and the current remuneration paid.

Potential effects of a System Change Compass transition on international dynamics

The *SCC (2020)*'s recommendations on the nature-based economic ecosystem focused on—among a number of issues—the promotion of nature-based products and carbon-positive companies, e.g., the sustainable farming and processing of seaweed for multiple uses, or ecotourism businesses, the introduction and scaling of PES programs, and the establishment of “nature & biodiversity accounting,” including the accounting for biodiversity impacts of imported food.

In addition, the EU decarbonisation targets and climate neutrality targets of European companies are likely to increase the demand for carbon offsetting. With regard to biodiversity finance, the European Commission announced that the EU will double its external funding for biodiversity (currently standing at EUR 3.5 billion), in particular for the most vulnerable countries,²⁰⁵ and launch strategic cooperation with African countries on biodiversity (“NaturAfrica”).²⁰⁶

202 Prerana Bhat, “Carbon Needs to Cost At Least \$100/Tonne Now to Reach Net Zero by 2050: Reuters Poll,” Reuters, accessed March 14, 2022, <https://www.reuters.com/business/cop/carbon-needs-cost-least-100tonne-now-reach-net-zero-by-2050-2021-10-25/>.

203 European Council, “Europe's Contribution to Climate Finance (€bn),” accessed March 14, 2022, <https://www.consilium.europa.eu/en/infographics/climate-finance/>.

204 Zainab Usman, Olumide Abimbola, and Imeh Ituen, “What Does the European Green Deal Mean for Africa?,” Carnegie Endowment for International Peace, accessed March 14, 2022, <https://carnegieendowment.org/2021/10/18/what-does-european-green-deal-mean-for-africa-pub-85570>.

205 “EU Action on Biodiversity Financing,” Knowledge for policy, accessed March 14, 2022, https://knowledge4policy.ec.europa.eu/biodiversity/eu-action-biodiversity-financing_en.

206 Usman, Abimbola, and Ituen, “What Does the European Green Deal Mean for Africa?”

Countries and regions providing cost-efficient nature-based solutions will likely benefit from increasing European demand for CO₂ compensation, nature-based products, and biodiversity finance.

Nature-based solutions (NbS) have received increasing recognition as opportunities to provide ecosystem services and unlock international investment that benefits nature and society. They are defined as actions to protect, sustainably manage, and restore ecosystems that address societal challenges and simultaneously provide human wellbeing and biodiversity benefits.²⁰⁷ NbS cover a broad range of activities that enhance the production of ecosystem services, e.g., the protection or restoration of forests providing a habitat for diverse species and contributing to carbon sequestration,

of wetlands filtering nutrients from freshwater supplies, or of mangroves and corals protecting coastlines from erosion and flooding. NbS business models are mainly based on the sale of commodities that are produced in nature- and climate-positive ways, e.g., timber, and agricultural produce from agroforestry, ecosystem services, such as carbon credits and biodiversity credits, and other services, such as ecotourism offerings. When looking at the geographic distribution of current NbS investment, Asia and Central/South America are found to be the regions with the largest value and/or volumes of investment—largely driven by the forestry sector.²⁰⁸ The ability to offer cost-effective solutions will likely influence to what extent countries or regions will be able to benefit from increased European demand for nature-positive commodities and carbon.

207 International Union for Conservation of Nature, “IUCN Global Standard for NbS,” IUCN, accessed March 14, 2022, <https://www.iucn.org/theme/nature-based-solutions/resources/iucn-global-standard-nbs>.

208 Finance Earth, *A Market Review of Nature-Based Solutions: An Emerging Institutional Asset Class*, 2021, 11, <https://finance.earth/wp-content/uploads/2021/05/Finance-Earth-GPC-Market-Review-of-NbS-Report-May-2021.pdf>.

3.6 ENERGY



FIGURE 15

Overview of energy ecosystem

Status Quo

HIC need to decrease their energy consumption, while **in LIC** 10% of the globe's population do not yet have access to electricity

EU dependent for over 50% of its energy consumption on imports of fossil fuels, mainly from Russia



System Change Compass vision for the EU

- Maximise the efficiency of all energy-consuming applications
- Shift to a renewable, clean energy mix
- Use of storage options like batteries and hydrogen
- Energy distribution grids that account for decentralised energy production and storage as well as the increased demand for electricity resulting from the electrification of transport, heating, and industry, and the scaling of green hydrogen as an energy source

International implications and opportunities of an EU System Change Compass transition



DECREASE OF EU IMPORTS FOR SPECIFIC PRODUCTS

The clean energy transition in the EU decreases demand for **fossil fuels** and increases demand for renewable energy imports from adjacent regions; this could facilitate the leapfrogging to clean energy production systems in African countries



INCREASE OF EU IMPORTS FLOWS OF SPECIFIC MATERIALS

Demand for **critical materials** will likely increase due to the scaling-up of the European transmission grid and energy storage capacity to cover increased electricity demand from electrification

Definition of the economic ecosystem

The energy economic ecosystem describes the provision of energy services to consumers and industries and thus comprises all components related to the production, conversion, supply, and use of energy. The energy economic ecosystem fulfils multiple societal needs as it is strongly interlinked with all other economic ecosystems. For example, the transport sector accounts for 28% of total energy consumption in the EU and buildings in the EU are responsible for approximately 40% of GHG emissions.

Status quo of international dynamics

Increasing the share of clean energy is a global challenge; while HIC also need to decrease their energy consumption, almost 10% of the global population, all living in LIC, do not have access to electricity.

Energy production is still responsible for almost three-quarters of global GHG emissions²⁰⁹—with a stark disparity between consumption rates per capita in HIC and LIC. Thanks to policy action and decreasing costs of wind and solar PV technologies,

the share of modern renewables in total final energy consumption had reached 11% in 2018 globally,²¹⁰ and 22% in the EU.²¹¹ For electricity generation, this share is over 25% globally²¹² and 38% in the EU.²¹³ However, swifter progress towards the transition to clean energy is needed to reach the targets of the Paris Agreement.

At the same time, the number of people without electricity access still stood at 770 million in 2019, 75% of them in sub-Saharan Africa.²¹⁴ What is more, about 2.6 billion people worldwide do not have access to clean cooking facilities and rely on solid biomass, kerosene, or coal as their primary cooking fuel, which leads to household air pollution and is linked to around 2.5 million premature deaths annually.²¹⁵

For over 50% of its energy consumption, the EU is dependent on imports of fossil fuels, mainly from Russia.

More than half of the EU's energy needs in 2019 were met by net imports (around 58%), with the main imported energy products being petroleum products, in particular crude oil (65%), followed by gas (27%) and solid fossil fuels, in particular coal (6%).²¹⁶ For imports of crude oil, natural gas, and coal, the EU mainly depends on Russia, which covers

209 IEA, "Greenhouse Gas Emissions from Energy Data Explorer," accessed March 23, 2022, <https://www.iea.org/articles/greenhouse-gas-emissions-from-energy-data-explorer>.

210 IEA, "Modern Renewables," accessed March 24, 2022, <https://www.iea.org/reports/sdg7-data-and-projections/modern-renewables>.

211 European Environment Agency, "Share of Energy Consumption from Renewable Sources in Europe," accessed March 4, 2022, <https://www.eea.europa.eu/ims/share-of-energy-consumption-from>.

212 "Global Energy Review 2021-Renewables," IEA, accessed March 24, 2022, <https://www.iea.org/reports/global-energy-review-2021/renewables>.

213 European Environment Agency, "Share of Energy Consumption from Renewable Sources in Europe."

214 IEA, "SDG7: Data and Projections - Access to Electricity," 7, accessed March 14, 2022, <https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity>.

215 International Energy Agency, *World Energy Outlook 2021 Executive Summary*, 2021, 9, <https://www.iea.org/reports/world-energy-outlook-2021/executive-summary>.

216 Eurostat, "From Where Do We Import Energy?," accessed March 14, 2022, <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html>.

about one third of crude oil imports,²¹⁷ 45% of natural gas imports,²¹⁸ and 47% of solid fuel (mostly coal) imports.²¹⁹ Other important trade partners include Algeria, Australia, Iraq, Kazakhstan, Nigeria, Norway, Saudi Arabia, and the United States.²²⁰ From an African perspective, oil exports represented the largest share of EU-Africa trade in 2019, with the EU importing crude oil worth EUR 7 billion from African countries.²²¹

Potential effects of a System Change Compass transition on international trade relations

The transition of the European energy system envisioned by the *SCC (2020)* is based on maximising energy efficiency, i.e., minimising the need for energy across all products and operations while maintaining or increasing the quality of life; a shift to a renewable, clean energy mix that is comprised of a combination of solar and wind power generation as primary sources; storage options like batteries for short-term storage and hydrogen for long-term storage; an expansion of the energy distribution grids to account for decentralised energy production and storage as well as the increased demand for electricity resulting from the electrification of transport, heating, and industry; and the scaling of green hydrogen as an energy source.

The clean energy transition in the EU is likely to decrease demand for fossil fuels and increase demand for renewable energy imports from adjacent regions; this could facilitate the leapfrogging to clean energy production systems in African countries.

A swift phase-out of oil, gas, and coal would significantly decrease the European dependency from imports from Russia. It might also lead to declining prices for African suppliers of crude oil, particularly after 2030. On the other hand, the increasing European demand for imports of green hydrogen presents an opportunity for North African countries that can produce green hydrogen cost-efficiently due to significant solar and wind energy potential and their geographical proximity. Hydrogen can also be seasonally stored and transported over long distances using gas pipelines. In addition, provided that electrical (undersea) interconnections between North African countries and Europe are expanded, these countries could benefit from cross-border trade of solar and wind power. This could ultimately lead to an integrated low-carbon Mediterranean electricity market.

217 America Hernandez, "Squeezing Putin Where It Hurts: His Oil Exports," POLITICO, March 21, 2022, <https://www.politico.eu/article/squeezing-putin-where-it-hurts-his-oil-exports/>.

218 IEA, "How Europe Can Cut Natural Gas Imports from Russia Significantly within a Year," March 3, 2022, <https://www.iea.org/news/how-europe-can-cut-natural-gas-imports-from-russia-significantly-within-a-year>.

219 Eurostat, "From Where Do We Import Energy?"

220 Ibid.

221 Usman, Abimbola, and Ituen, "What Does the European Green Deal Mean for Africa?"

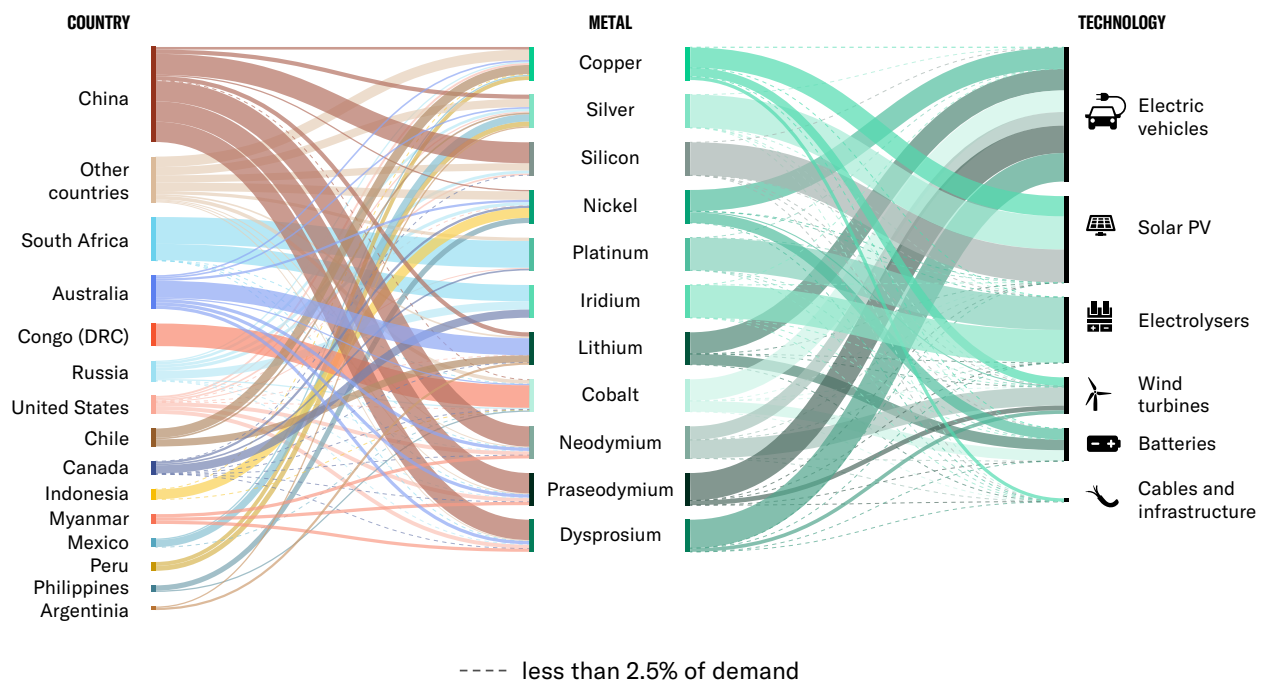
Demand for critical materials will likely increase due to the scaling-up of the European transmission grid and energy storage capacity to cover increased electricity demand from electrification.

The electrification of transport, heating, and industry processes will increase demand for raw materials that are critical for the production of batteries and the expansion of the transmission grids, such as

nickel, manganese, cobalt, copper, and rare earths, for which the EU is fully import-dependent. The increased global demand will most likely lead to price increases and raise the risk of sourcing conflict metals/minerals (e.g., from DRC).²²² On the other hand, this development means economic opportunities for countries producing these critical raw materials.

FIGURE 16

Extraction of critical metals needed for a sustainable energy system



Source: Metabolic (2021), *Towards a Circular Energy Transition*²²³

222 Ewelina U. Ochab, “Are These Tech Companies Complicit In Human Rights Abuses of Child Cobalt Miners In Congo?,” *Forbes*, January 13, 2020, <https://www.forbes.com/sites/ewelinaochab/2020/01/13/are-these-tech-companies-complicit-in-human-rights-abuses-of-child-cobalt-miners-in-congo/>.

223 Metabolic, *Towards a Circular Energy Transition: Exploring Solutions to Mitigate Surging Demand for Critical Metals in the Energy Transition*, June 2021, <https://www.metabolic.nl/publications/towards-a-circular-energy-transition/>.

3.7 CIRCULAR MATERIALS



FIGURE 17

Overview of circular materials ecosystem



Definition of the economic ecosystem

The circular materials economic ecosystem refers to all the materials from which products, equipment, infrastructure, and other goods are made. Therefore, it is deeply interwoven with all economic ecosystems that directly meet societal needs. This economic ecosystem provides the required materials needed in the first four economic ecosystems as sustainably as possible; when the materials are no longer fulfilling a useful purpose, it seeks to recover, disassemble, and recycle them at the highest possible value. It thus covers the raw material extraction and production process on the one hand, and the management of end-of-life products and goods on the other. It is founded on the development of innovative circular and regenerative technologies but also reverse logistics chains, asset recovery, and improved recycling. A circular, closed-loop system is enabled through circular design, better materials, and an infrastructure of collection, disassembly, sorting, recycling, and remanufacturing facilities to eliminate waste from the system.



Status quo of international dynamics

Europe is the most import-dependent region on the planet.

Comparing production and consumption of all materials (non-metallic minerals, biomass, fossil fuels, and metal ores), only North America and Europe consume more materials than they produce. All other regions on the planet produce more than they currently consume, making them net exporters of material resources. Large parts of this vulnerable dependence are caused by underutilisation and wastefulness (see built, mobility, and consumer goods ecosystems above).

Europe is particularly import dependent when it comes to those metals and raw materials that are essential to create the infrastructure needed for the green transition.

The import reliance for most metals is between 75% and 100%, according to data from the European Commission.²²⁴ Import reliance is particularly troublesome in the case of those raw materials that are necessary to build the green infrastructure envisaged in the EGD, such as photovoltaics, batteries, electric vehicle motors, wind turbines, and fuel cells.²²⁵ For example, the EU is 100% import reliant on rare earth elements, 98% of which are sourced from China.²²⁶ Rare earth elements cannot be substituted with materials of comparable quality or at reasonable price points. In other words, Europe is close to 100% reliant on China for creating the infrastructure needed to achieve essential elements of the EGD.

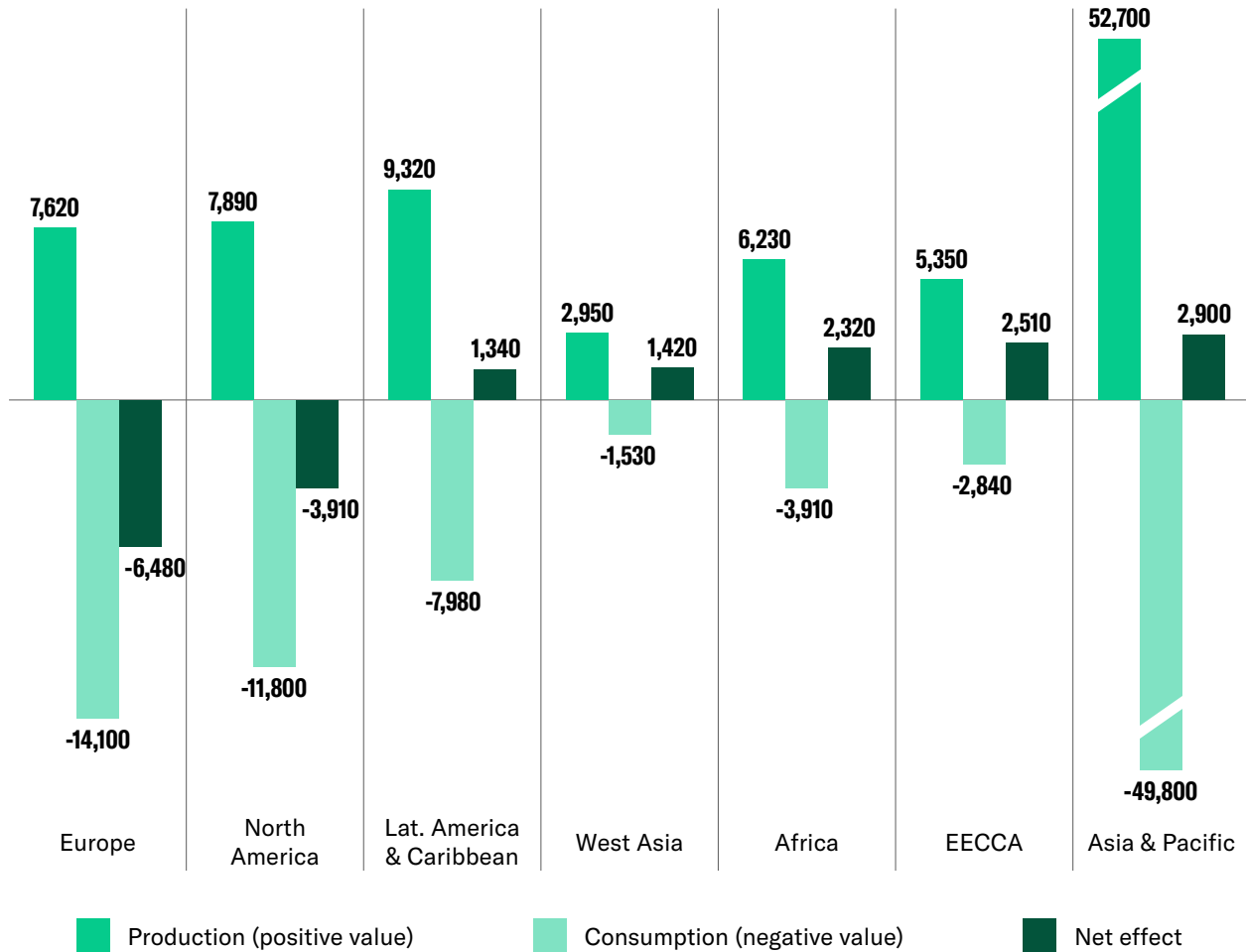
224 European Commission, *Critical Raw Materials Resilience: Charting a Path towards Greater Security and Sustainability* (Brussels, March 9, 2020), 19-22, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474&from=EN>.

225 European Commission, Directorate General for Internal Market, Industry, Entrepreneurship and SMEs, *3rd Raw Materials Scoreboard: European Innovation Partnership on Raw Materials*. (LU: Publications Office, 2021), 47, <https://data.europa.eu/doi/10.2873/567799>.

226 European Commission, "Critical Raw Materials," accessed March 23, 2022, https://ec.europa.eu/growth/sectors/raw-materials/areas-specific-interest/critical-raw-materials_es.

FIGURE 18

Production and consumption per region, in megatons per year. Includes non-metallic minerals, biomass, fossil fuels, and metal ores

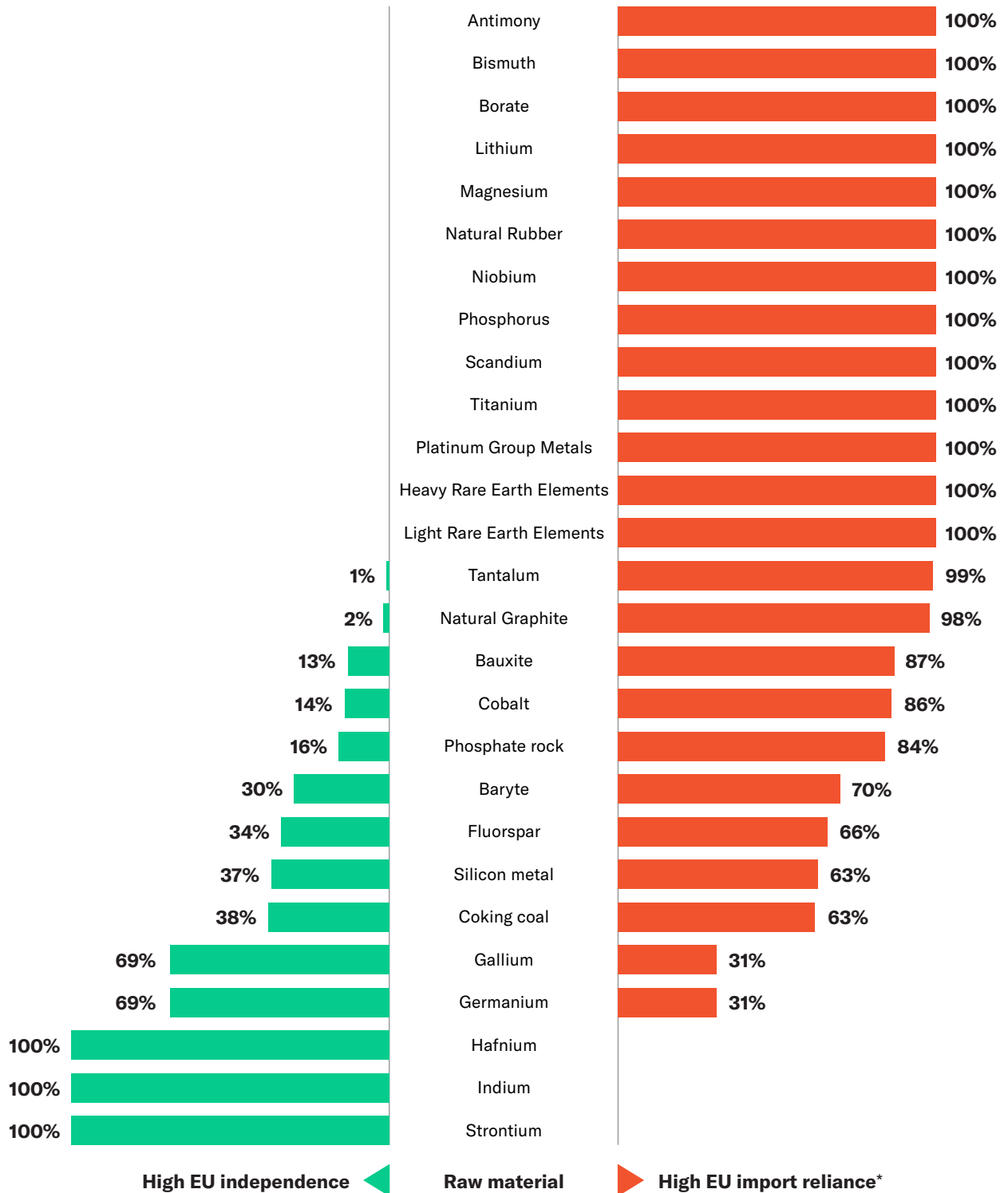


Source: Metabolic (2020), The Global Metabolism Initiative²²⁷

227 Metabolic, "The Global Metabolism Initiative: Mapping the Health of Our Planet," accessed March 18, 2022, <https://www.metabolic.nl/institute/gmi/>.

FIGURE 19

European Union’s critical raw material reliance



* Import reliance = (import – export) / (domestic production + import – export)

Source: European Commission (2020), Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability²²⁸

228 European Commission, “Critical Raw Materials Resilience: Charting a Path towards Greater Security and Sustainability.”

Europe's consumption of raw material is at the expense of natural ecosystems and societies living in other parts of the world. Moreover, by exporting its waste to other regions, the EU is outsourcing the pollution associated with its resource consumption.

The production of virgin raw materials, particularly metals, is the cause of enormous environmental pollution as well as toxic effects on humans and natural ecosystems.²²⁹ As a result, Europe's approach to overconsuming material produced elsewhere effectively outsources environmental and social costs associated with raw material production, particularly mining.

In addition to the environmental and social costs associated with mining, Europe continues to be a major exporter of waste. In 2020, waste exports from the EU to non-EU countries reached an all-time high volume of 32.7 million tonnes—a 75% increase since 2004.²³⁰ Most of the waste by far goes to Turkey (13.7 million tonnes), followed by India (2.9 million tonnes). Most of the exported waste is iron and steel (17.4 million tonnes, mostly from building sites), followed by paper and cardboard (6.1 million tonnes), plastic (2.4 million tonnes), copper, aluminium, and nickel (1.6 million tonnes) and textiles (1.4 million tonnes).

In effect, by shipping waste out of the EU, the EU is relieving itself of the duty to manage its own waste and removes most incentives to prevent waste in the first place. Moreover, waste exports prevent the rapid creation of a secondary raw materials market in Europe that would contribute to reducing the EU's dependence on imported raw materials.²³¹

Potential effects of a System Change Compass transition on international trade relations

The recommendations made in the *SCC (2020)* on the circular materials ecosystem would have profound implications for the EU's international trade relations. Core to the *SCC (2020)*'s recommendations was the adoption of a full life cycle perspective on materials, ensuring that they are tracked throughout their use phase, recovered, disassembled, and recycled into highly valued secondary raw materials. Where possible, the *SCC (2020)* recommended the substitution of materials towards renewable, durable, recyclable and less energy-intensive materials. Also, in the case of materials for renewable energy, an essential part of resilience is to lower the total energy demand, in addition to circular use of the materials for renewable energy technology—which would be best achieved through the *SCC (2020)* recommendations in the built environment and mobility system.²³²

The envisioned system change scenario for the use and stewardship of raw materials in the EU would lead to a drastic reduction in material imports and exports.

In a sustainable, circular economy, materials will be kept in use for extended periods and the need for materials would decrease, in the first place through better system design. Once materials (or products made from them) have reached the end of their use-time, materials would be recovered and made available again for reprocessing as secondary raw materials. In the context of stagnant population

229 OECD, *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*, October 2018, 17-19, <https://www.oecd.org/environment/waste/highlights-global-material-resources-outlook-to-2060.pdf>.

230 Eurostat, "Where Does EU Waste Go?," April 20, 2021, <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210420-1>.

231 See EEB press statement: "EU Waste Shipment Regulation Falls Short of Fixing Europe's Waste Export Crisis."

232 European Economic and Social Committee, *The Role of Critical Raw Materials to Form a Strong Industrial Base*, July 13, 2021, <https://www.eesc.europa.eu/sites/default/files/files/qe-09-21-313-en-n.pdf>.



development in the EU, there would be no need to increase the stock of resources circulating in the economy. There would also be no need to import large volumes of raw materials only to process them and ship them off as waste after use. By creating a highly fluid market for secondary raw materials, the EU would become much more resilient and independent of geopolitical constraints or circumstances that have impacted value chains in the past.

If the EU succeeds in leading the development of high-value recovery, disassembly, and recycling technologies, it might even become a net importer of “waste” from other regions in order to turn materials embedded in that waste into secondary raw

materials. Such materials could be processed and made available to Europe’s industry and businesses at lower environmental and financial costs than current raw material imports.

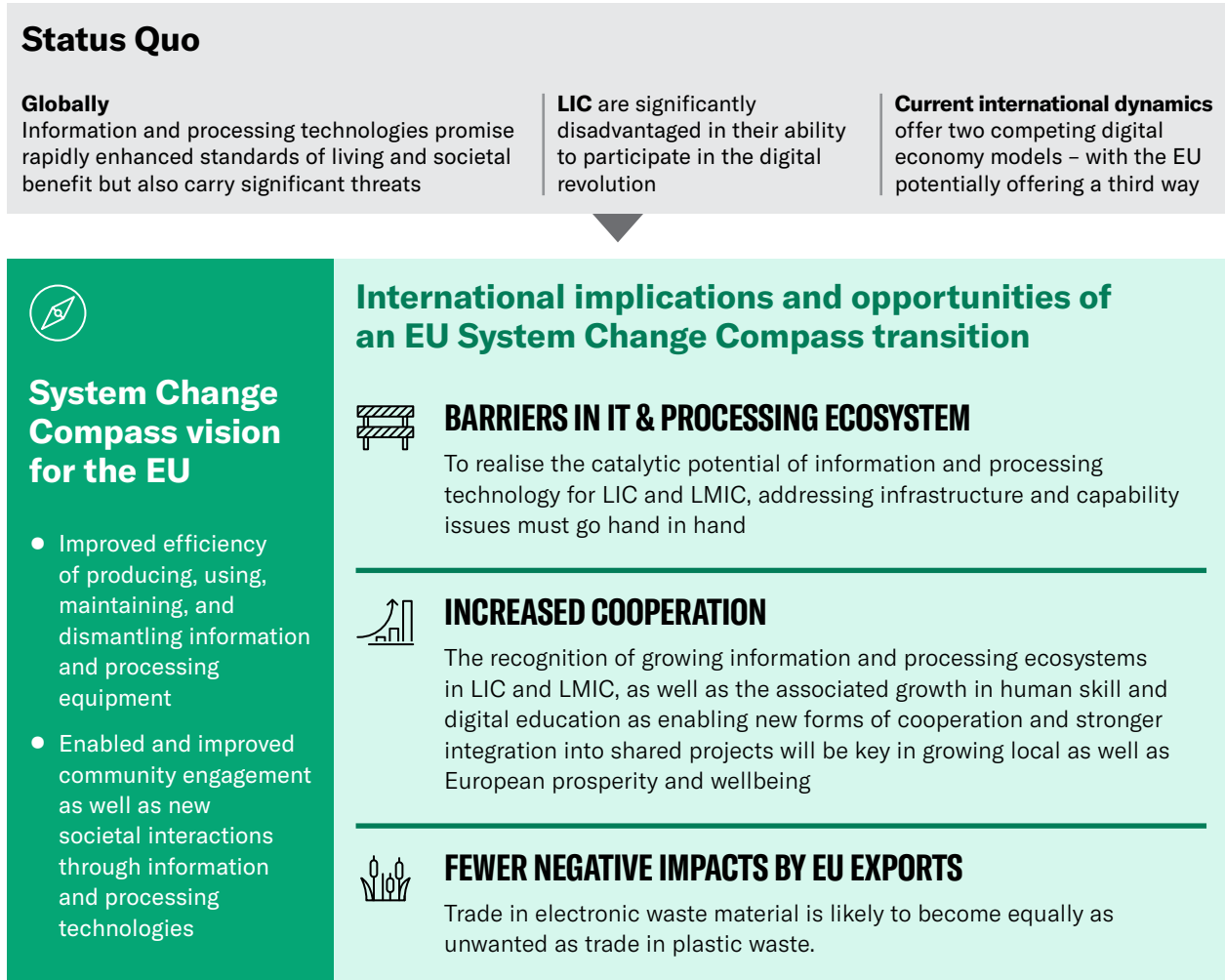
In effect, Europe could become self-sufficient regarding its own resource needs, increasing its geopolitical independence (just as with green energy). In addition, Europe could become the main economic area for closing the loop on circular materials: Importing waste and end-of use products from elsewhere in the world. Europe would be able to transform them into high-value secondary materials and use those abundant secondary raw materials to create high-value products for global application.

3.8 INFORMATION AND PROCESSING



FIGURE 20

Overview of information and processing ecosystem



Definition of the economic ecosystem

The information and processing ecosystem refers to information and processing in all its possible applications. The information and processing ecosystem facilitates the other ecosystems, particularly the first four (built environment, healthy food, intermodal mobility, consumer goods), in their delivery of societal needs.

Status quo of international dynamics

Information and processing technologies promise rapidly enhanced standards of living and societal benefit—but they come with significant threats that materialise if not well managed.

Digital technology and processing capabilities play an essential part in providing better services, improving standards of living, increasing societal participation, and improving the productivity of other economic ecosystems. Advanced applications of artificial intelligence are beginning to enable better environmental protection and solve apparent trade-offs in the transition to a green and socially just future.

At the same time, the rapid development and deployment of information and processing capabilities can challenge societies—from loss of employment to intrusion of privacy, and loss of control over private data. Moreover, benefits from information and processing capabilities are not

equally captured by all individuals and countries. Capturing the benefits of a digital transition requires the right policies, resources, and infrastructure (not least, internet access) to be in place as well as a suitably trained workforce. If left unmanaged, the digital transition risks a situation where benefits accrue to providers of platforms (under “winner takes all” systems) or technologies situated in high-income countries whose economic ecosystems are more advanced in this area (mostly the US and China).²³³

Finally, the resource demands (materials, particularly rare earth minerals, as well as energy) of information and processing technologies are mounting quickly. Until a fully circular digital economy is achieved, a constant trade-off will continue to be necessary between introducing as much information and processing technology as necessary and as little as possible.

LIC are significantly disadvantaged in their ability to participate in the digital revolution.

Disadvantages for LIC to benefit from digital technologies abound. There is a lack of availability of internet access²³⁴ or mobile coverage,²³⁵ costs are high,²³⁶ and reliable electricity is still lacking in too many situations. Moreover, content is rarely available in local languages, creating additional barriers to deploy or benefit from digital solutions. These disadvantages are compounded by societal barriers in lower middle-income countries (LMIC). In 2020, women in LMIC were 15% less likely to use mobile internet than men—more than 230 million fewer women than men.²³⁷

233 Geraldine De Bastion and Sreekanth Mukku, *Data and the Global South: Key Issues for Inclusive Digital Development* (Heinrich-Böll-Stiftung Washington, DC, October 2020), 27, <https://us.boell.org/en/2020/10/20/data-and-global-south-key-issues-inclusive-digital-development>.

234 Arwen Armbricht, “4 Reasons 4 billion People Are Still Offline,” World Economic Forum, February 23, 2016, <https://www.weforum.org/agenda/2016/02/4-reasons-4-billion-people-are-still-offline/>.

235 Alliance for Affordable Internet, *2019 Affordability Report*, n.d., <https://a4ai.org/affordability-report/report/2019/>.

236 De Bastion and Mukku, *Data, and the Global South: Key Issues for Inclusive Digital Development*, 19.

237 Anne Delaporte and Kalvin Bahia, *The State of Mobile Internet Connectivity 2021* (GSM Association, September 2021), 6, <https://www.gsma.com/r/wp-content/uploads/2021/09/The-State-of-Mobile-Internet-Connectivity-Report-2021.pdf>.

Current international dynamics offer two competing digital economy models—with the EU potentially offering a third way.

Over the past decades, China and the US have emerged with two competing models for a digital economy—a market-oriented, liberal model by the US and a state-led, controlled model by China.²³⁸ With its Global Gateway Initiative, the EU has begun to offer a potential third way for a digital economy, combining a market-based model with human-centred normative guardrails, particularly focusing on data and privacy rights.²³⁹ Current dynamics focus on establishing different competing digital economy models through funding and associated infrastructure programs. In some instances, such as with the EU’s Global Gateway, these efforts include consideration for respective domestic capability building in target countries. Nevertheless, a primary focus on infrastructure deployment and funding—as envisaged in the Global Gateway—will be insufficient to solve the bigger question of what kind of digital economy model LIC and LMIC want to achieve and provide to their citizens. The current dynamics are focused on opportunity, rather than purposeful development and new forms of collaboration around digital technology.

Potential effects of a System Change Compass transition on international trade relations

The SCC (2020) made two sets of related recommendations to improve the use of information and processing technologies. On the one hand, it recommended various methods to improve efficiency of producing, using, maintaining, and dismantling information and processing equipment. On the other



hand, it suggested ways in which information and processing technology can be used to enable and improve community engagement as well as new societal interactions.

To realise the catalytic potential of information and processing technology for LIC and LMIC, addressing infrastructure and capability issues must go hand in hand.

The infrastructure and connectivity gap is the most pressing issue that needs to be addressed to enable the information and processing ecosystem to contribute to societal wellbeing. Global Gateway priorities can effectively meet this challenge. As infrastructure becomes increasingly available, the build-up of local capabilities and capacities must receive equal attention. Training and education programs, going from digital literacy all the way to advanced programming and modern manufacturing methods, are necessary to elevate usage of digital technologies from mere “consumership” towards usership and enablement of dematerialised, decentralised, and highly efficient provisioning systems.

238 Kerstin Fritzsche and Daniel Spoiala, *Digital for Development – an Analysis from a Geopolitical Perspective* (Berlin: Institut für Zukunftsstudien und Technologiebewertung (izt), October 2021), 43-47, https://www.izt.de/fileadmin/downloads/pdf/2021_IZT_Digital_for_Development_Analysis_from_geopolitical_perspective_final.pdf.

239 Fritzsche and Spoiala, 43-47.

Improved information and processing systems, along with critical digital education, will lead to more distributed and re-localised employment, resulting in a potentially more equitable distribution of highly skilled employment. Trade in electronic waste material is likely to become equally as unwanted as trade in plastic waste.

Growth in digital infrastructure and accompanying education will enable value chains—particularly in the digital service industry—to become even more distributed and decentralised. Programmers from all over the world will be able to work together on joint projects, regardless of their geographic location. In this context, the attractiveness and openness of digital assets and intellectual property will increase in importance. Europe should envisage LIC and LMIC not just as new markets to conquer (a stereotypical American perspective) or sphere of influence to control (a stereotypical Chinese perspective). Instead, recognising the growing information and processing ecosystems in LIC and LMIC, as well as the associated growth in human skill and digital education as enabling new forms of cooperation and stronger integration into shared projects’ will be key in growing local as well as European prosperity and wellbeing.

By the same token, as the use of information and processing technologies increases, so will the pressure and need to find closed-loop solutions for the materials associated with them. It is likely that in this context, countries that currently accept e-waste for end-of-life processing will become increasingly restrictive. Just as the export of plastic waste out of Europe has met increasing resistance, so it is probable that Europe will have to find better solutions for its electronic waste as well—instead of shipping it off to countries in Africa and elsewhere. Creating the infrastructure to share digital passports and disassembly routines with international partners would be an important contribution by Europe to enable better global avoidance and management of e-waste.

3.9 RECOMMENDATIONS FOR ACHIEVING THE GREEN AND SOCIALLY JUST GLOBAL TRANSITION ACROSS ALL EIGHT ECONOMIC ECOSYSTEMS

The transition in Europe must ensure that the environmental footprint of the EU’s exports and imports is reduced. At the same time, the transition must mitigate potential negative impacts and create opportunities for trade partners that allow them to achieve their own environmental and social policy goals and continue trading with Europe. The EU can be the catalyst for the transition of many LIC and LMIC. Such a transition can bring people out of poverty and boost global wellbeing while supporting the whole world in achieving better living conditions.

Most low- and middle-income countries worldwide will continue to experience strong population growth coupled with rapid urbanisation and increasing demand for food supply, mobility, and consumer goods. While these countries have “room to progress economically” their resource consumption within planetary boundaries, it would not be sustainable nor—based on the experiences like traffic jams, loss of equilibrium of stable soil, lack of affordable housing—desirable for all low- and middle-income countries to follow the highly resource- and carbon-intensive growth model that Europe and other high-income regions have taken. Consequently, the EU should work to support its international partners in low- and middle-income regions to leapfrog urban design and building technologies to apply sustainable practices as quickly and as widely as possible while also improving efforts to demonstrate this at home). Equally important, high-income countries cannot continue to drive high-levels of resource consumption, and the EU should also work with its rich trading partners to pursue dematerialised and decarbonised business and living models that foster wellbeing.

FIGURE 21

Policy recommendations for the eight economic ecosystems

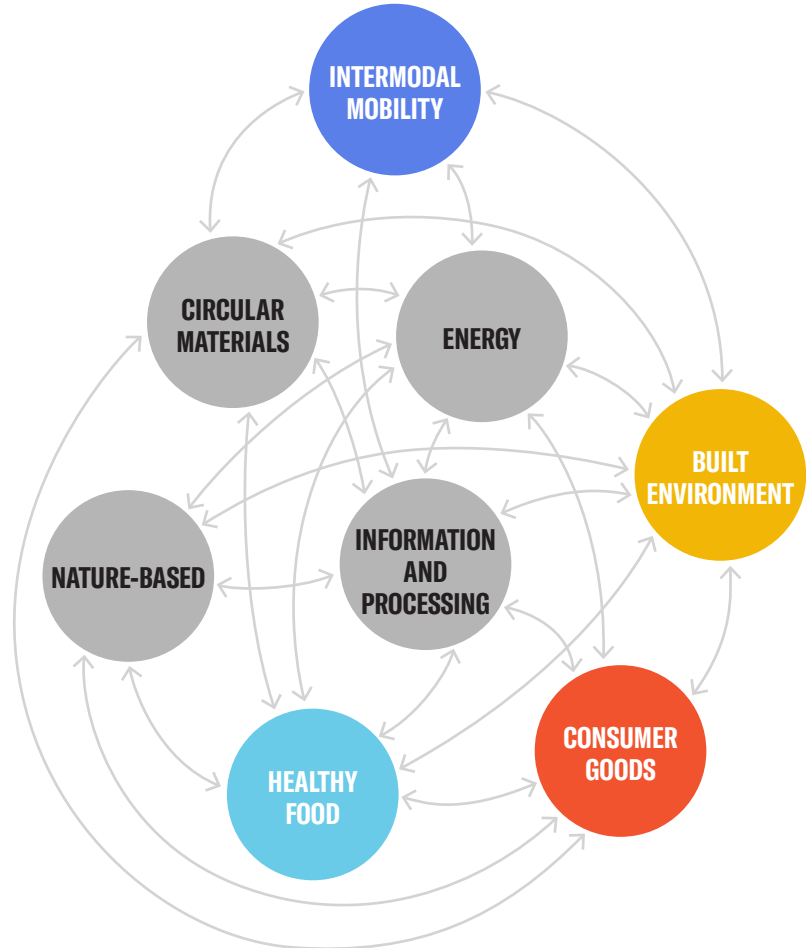
PER ECOSYSTEM...

Four economic ecosystems meeting a specific societal need:

- Healthy food
- Intermodal mobility
- Built environment
- Consumer goods

Four economic ecosystems supporting the other economic ecosystems in their delivery of societal needs:

- Nature-based
- Energy
- Circular materials
- Information and processing



Source: SYSTEMIQ and The Club of Rome, System Change Compass (2020)

Develop a knowledge base of in-depth impact assessments per ecosystem	Promote efficient material resource use for low-carbon products & technologies in the EU	Identify synergies between European sustainability standards and LMIC's domestic policy goals	Reduce the negative footprint of exports and in international subsidiaries	Engage public & private finance for a joint innovation investment in LIC production system adaption	Support technological capacity of LIC to champion low-carbon and circular business models

Specifically, the EU should:

- **Develop a knowledge base of in-depth impact assessments per economic ecosystem** that provides information on the expected impacts of a systemic EGD implementation along international value chains, and flag current dependencies.
- **Cooperate with international trade partners to identify synergies between European sustainability standards and LMIC's domestic policy goals** that could be the basis for future partnerships and for shaping development cooperation in a co-creative way.

Respective research could focus, for instance, on modelling the impacts of System Change Compass-aligned EGD policy pathways on different value chains, including the resource and financial flows between the EU and other regions/countries. Based on such an analysis, focus countries could be determined where important sectors of the domestic economy will likely be impacted by the EGD (e.g., Bangladesh, Côte d'Ivoire, Turkey, and Brazil).

- **Promote highly efficient material resource use for low-carbon products and technologies in European markets to avoid a mining boom in resource-rich countries.**

A sudden surge in material requirements from decarbonisation efforts in the EU linked to the demands of renewable energy production could cause large-scale environmental damage.

This is, for example, highly relevant for batteries and renewable energy generation that facilitate the transition of the mobility economic ecosystem. Strategies to achieve increased material efficiency for these technologies include improved design and material innovation, such as lightweight materials for wind turbine generators, ensuring highest possible performance, and improving recovery and recycling rates of the materials used. Initiatives like the “battery passport” can facilitate this by creating transparency and enhancing performance and battery life, as well as recyclability.

For instance, the EU could seek cooperation with producer countries on deforestation-risk commodities (such as soy, cocoa, palm oil), that currently make up a significant share of EU food imports, to support them in reducing the local drivers of deforestation and support smallholders in complying with sustainability standards. Supporting governance capacity for forest protection and land tenure in, for example, Côte d'Ivoire would be aligned with policy goals of forest preservation and climate adaptation in this country, where a drastic reduction in forests has been mainly linked to uncontrolled exploitation.²⁴⁰ Information campaigns and capacity development could support the improvement of livelihoods for smallholders in producer countries while at the same time decreasing the environmental footprint of the EU's upstream supply chains.

With regard to CBAM, mechanisms should be developed that do not unfairly penalise the exports from lower-income countries, e.g., by temporarily exempting specific countries until they reach a specific threshold of development. Concurrently, safeguard provisions that guard against carbon leakage—whereby carbon-intensive production shifts to low-income countries in order to avoid the EU's CBAM—and that could be triggered in the event of a surge in imports from an exempt country should be implemented.²⁴¹

240 République of Cote d'Ivoire Ministry of Water and Forests, *National Policy on Forest Preservation, Rehabilitation and Expansion*, June 1, 2018, 7, https://eauxetforets.gouv.ci/sites/default/files/communiqué/forest_preservation_rehabilitation_extension_national_policy.pdf.

241 Sam Lowe, *The EU's Carbon Border Adjustment Mechanism How to Make It Work for Developing Countries* (Centre for European Reform and Open Society European Policy Institute, April 2021), 1, https://www.cer.eu/sites/default/files/pbrief_cbam_sl_21.4.21.pdf.

To leverage the opportunities arising from stronger demand for plant-based proteins, the EU could focus its cooperation with African countries on supporting agricultural efficiency that allows producers of pulses (e.g., chickpeas, lentils, and beans) to close the current gap between potential and actual yields and increase profitability. This could, on the one hand, help meet policy goals around food security and economic growth in African countries, and on the other hand, help meet EU demand with relatively short supply chains.

- **Incentivise and enable European companies to reduce the negative footprint of their exports and implement sustainability measures across their international subsidiaries** beyond the EU's borders instead of “dumping” unsustainable products on the global market or shifting unsustainable production to other parts of the world. This could entail different policies and financial incentives, as well as bridging potential short-term losses.
- **Create financial mechanisms and engage the private finance sector to make additional funds available for LIC that want to adapt their production systems** in a way that makes them more circular and less carbon-intensive, and thus more competitive, while at the same time being able to pursue other policy priorities.

For instance, the EU could implement a mechanism that earmarks revenues generated by the CBAM to be used to finance the climate transition in low-income countries—either by using the funds to financially support sustainability efforts in affected partner countries or, more generally, by making these revenues available to international climate funds.

The EU should also incentivise and partner with the private finance sector to strategically align its investments beyond EU borders with enabling a

low-carbon and resource-efficient transition. This could be facilitated—as envisioned by the Global Gateway initiative—through blended finance initiatives that mobilise private investment for sustainable infrastructure and scaling of green technologies.

- **Support the local availability of technological capacity that enables LIC to champion low-carbon and circular business models**, bridge losses in previous export segments, and leapfrog to sustainable technology pathways. This might include facilitating a broader technology transfer, supporting context-adjusted innovation, and providing amnesties on intellectual property rights where needed. Respective initiatives could be inspired by, or linked with, the UN Technology Facilitation Mechanism that encourages multi-stakeholder collaboration to provide low-income countries with access to technologies needed for achieving the SDGs.

For example, the EU could support North African countries in developing and scaling hydrogen production capacities, part of which could be exported to Europe in the future to meet the increasing demand for green steel production and sustainable shipping fuels. It could also help North African countries in leapfrogging to sustainable domestic energy and mobility systems. Thanks to the cost-competitiveness of solar power in that region, it has ample supply of renewable energy needed for green hydrogen production. In addition to financial and political support, as well as research and development infrastructure, technological know-how and training of professionals is needed to seize this opportunity. This could, for instance, be supported by the development of research capacities into green hydrogen at universities throughout Africa. As a market-making mechanism, the EU should also consider offtake commitments for future production volumes to de-risk infrastructure investments.

4. GLOBAL GOVERNANCE

4.1 INTRODUCTION

The transformations suggested in previous chapters—in particular, the system-level orientations outlined in Chapter 2.2—are guided by the overall vision of reducing the global need for virgin natural resources, changing post-colonial international power patterns of natural resource appropriation, and organising resource use and labour around meeting human needs in a way that respects planetary boundaries.

This paradigm shift and the transitions necessary to bring it to life cannot be achieved in isolation. While the EU can take crucial steps by introducing certain domestic policy changes, the global nature of the challenge as well as the international interdependencies of current markets and value chains make bilateral and multilateral cooperation indispensable to achieve a radical transition. What is more, non-state actors such as transnational NGOs, business associations, multistakeholder networks as well as multinational corporations contribute to shaping the international dialogue and the predominant standards and practices throughout international value chains. Fundamental changes will therefore hardly be achieved without involving these actors.

These interdependencies make it crucial to take a global governance perspective when looking at the challenges and opportunities for implementing the recommendations laid out in this report. For instance, adjusting trade agreements in a way that enables lower-income countries currently relying on resource-intensive exports to diversify their economies—as suggested in system-level orientation 2.2.—might require not just bilateral, but multilateral negotiations to change current trade rules that are contradictory to this endeavour. Similarly, the

aspiration of introducing global standards for natural capital accounting and improved transparency along value chains—as outlined in system-level orientation 4.3.—will make it indispensable to deliberate and cooperate with transnational governance actors, such as international business or investor associations, NGOs, and multistakeholder networks, which shape the content and dissemination of transnational standards among market actors. To give another example, introducing a shift towards measuring economic progress in terms of resource productivity in international economic institutions—as envisioned in system-level orientation 3.3.—and opening key international fora, such as the G20, to the participation of lower-income regions—as suggested in system-level orientation 10.1.—requires gaining broad political support for institutional changes, not only from the respective institutions' governing body, but also its member states.

Global Governance

Global governance refers to the complex of rules, policy interventions, and institutions that are used to manage international and transnational interactions within and among the state, civil society, and the private sector. In contrast to the narrow definition of governance exclusively focused on non-hierarchical modes of steering society and private transnational actors, we apply the more comprehensive understanding which comprises hierarchical as well as public-private and private modes of governance and considers their interactions.

TABLE 2

For a number of system-level orientations, successful implementation requires a global governance perspective

PRINCIPLES: REDEFINING...	SYSTEM LEVEL ORIENTATIONS
	Implementation of the bolded Orientations requires a global governance perspective
1. Prosperity	<ol style="list-style-type: none"> 1. Obligatory modelling of long-term impacts on regional and international resource use and intergenerational equity 2. Better leverage of fiscal policies for sustainable resource management 3. Specific indicators for social, labour, and environmental standards and extended legal accountability for MNEs
2. Resource Use	<ol style="list-style-type: none"> 1. Set targets & monitor Europe's material footprint reduction 2. Trade agreements that enable economic diversification in LIC 3. Report consumption-based impact footprints in climate & biodiversity
3. Progress	<ol style="list-style-type: none"> 1. Lead debate on holistic progress indicators beyond GDP 2. Measure economic performance in resource productivity 3. Integrate resource productivity logic in international institutions
4. Metrics	<ol style="list-style-type: none"> 1. Deployment of wellbeing indicator 2. Science-based international classification system 3. International standards for risk assessment and for placing a value on nature and transparency of value chains
5. Competitiveness	<ol style="list-style-type: none"> 1. International "just transition fund" 2. Technological transfer, amnesties for intellectual property, fair share of the value created across the value chain 3. Innovation funding in reshaping industries
6. Incentives	<ol style="list-style-type: none"> 1. Global standards incorporating environmental, social & risk costs of GHG emissions & resource extraction in the pricing of materials 2. Phase out all harmful and unsustainable subsidies 3. Measure ecosystem services at a global level and recognise their value financially
7. Consumption	<ol style="list-style-type: none"> 1. Minimum environmental and social standards for imports 2. Promote stewardship of products 3. Apply a maximum consumer footprint per capita
8. Finance	<ol style="list-style-type: none"> 1. Risks of climate, nature, and biodiversity impacts as criteria for multilateral financial accounting 2. Aid enabling shifts in trade deficits and debt dependencies to allow for the leapfrogging of unsustainable economic practices 3. Shifting the global financial architecture, i.e., restructuring finance institutions
9. Governance	<ol style="list-style-type: none"> 1. Advance economic and societal models based on long-term planning 2. Formal international forum on stewarding global (virgin) resource use 3. Rebalancing institutional voting rights
10. Leadership	<ol style="list-style-type: none"> 1. Strengthen and rebuild trust and cooperation between Europe and lower-income regions 2. Clearly and transparently communicate trade-offs and the need for a paradigm shift 3. Focus on future generations and young people, many of whom live outside Europe

The EU has already demonstrated that it is fit to play a leadership role in the development, adoption, and operationalisation of important global governance initiatives, including the Kyoto Protocol and the Paris Agreement. In the run-up to the latter, the institution of the “High Ambition Coalition,” led by the EU, was crucial to get key actors on board and achieve an ambitious deal. In the ongoing process of implementing the Paris Agreement, the EU’s ability to “lead by example” and implement ambitious climate action domestically, has been essential for its credibility as a leader in climate diplomacy. To keep playing a pivotal role in this context, EU member states need to demonstrate internal agreement. Drawing on the lessons from the EU’s role in global climate governance, the Green Deal must form an important basis for the EU to initiate systemic shifts to global institutions where the EU has power and weight. This will support achieving the EGD vision inside and outside of Europe.

“The Green Deal must form a basis for the EU to initiate systemic shifts in global institutions where it has power and weight”

This chapter does the following:

1. Screens the **major global governance gaps and barriers to an implementation** of the principles and respective system-level orientations outlined in this report.
2. Explores different **opportunities to overcome global governance challenges:** (a) adjusting the governance mechanisms that shape global value chains and the role the EU can play in initiating those, (b) bridging the institutional gap for international resource management and (c) redesigning international institutions to enhance legitimacy and effectiveness.

“The EU has already demonstrated its leadership role in global governance initiatives, including the Kyoto Protocol and the Paris Agreement”

This chapter acknowledges the diversity of global governance challenges, the inherent complexity of global governance for sustainable development as well as the vast extent of existing expertise and literature on these topics. By anchoring this chapter in the system-level orientations outlined in section 2.2 of this report, we aim to take a specific natural resource management perspective towards global governance—given the importance of resources not just for environmental and climate goals, but also for international power dynamics, dependencies, and distribution of wealth. To align the global governance architecture with the economic necessities of implementing the EGD, this section outlines a set of recommendations.

4.2 CHALLENGES TO IMPLEMENTATION WITHIN THE CURRENT GLOBAL GOVERNANCE SYSTEM

The current global governance architecture and the predominant paradigms shaping today’s international institutions show certain imbalances and deficits that form barriers to a transition towards a green and just global society.

International institutions tend to be shaped by the paradigm of neo-liberal economics often leading to the pursuit of short-term GDP-based economic interests rather than long-term human development.

Today’s prevailing neo-liberal economic discourse in international development institutions claims that resource-consuming economic growth is

the only route to socio economic progress. This conceptualisation of economic development is still embedded in key international institutions and shapes trade, capital flows, target-setting, metrics, financial incentive structures, and the distribution of bargaining power in international negotiations. As a result, priorities are dominated by the goal to maximise short-term economic and political benefits, while social and ecological challenges are often sidelined. Systemic transformation, however, needs to align short-term interests with long-term interests and planning. This requires the use of concepts that broaden the focus towards a human needs-based economic development within planetary boundaries.

International institutions suffer from a lack of legitimacy due to insufficient representation of LIC's interests, science and other nongovernmental actors.

Legitimacy of institutions mainly derives from the balanced representation of relevant stakeholders. High levels of transparency, and the acceptance and support from external key stakeholders such as businesses, civil society actors or the scientific community can further improve legitimacy.

The design of most international institutions, like the World Bank and the International Monetary Fund, reflects former colonial power relations, former military success, or current economic might—a continuation of geopolitics through different means. These governance institutions historically are shaped around and cater to needs of Western, high-income regions. As a result, not all voices receive equal weight: Membership criteria, voting rights and other structural barriers prevent those who have most to lose from the effects of climate change from having a seat at the table. Similarly, proposed “High Ambition Coalitions,” such as the German concept of a Climate Club, often use economic parameters for “high ambition” that disqualify LIC (and label them as less ambitious) or the most vulnerable countries from the outset.

“Economies such as Brazil, China and India have intensified forms of “South-South cooperation”, sidestepping the traditional international institutions”

In parallel, large low- to middle-income economies, such as Brazil, China, and India, have intensified forms of “South-South cooperation,” have created informal networks, and have leveraged public-private partnerships to address significant deficits on trade, investment, technology transfer, and development aid—thereby sidestepping the “traditional” international institutions.²⁴² Although these alternative networks are more diverse in terms of interests and representation, the needs of the most vulnerable countries are often overlooked.

In addition, the current institutional setup and working modes of many international institutions tend to neglect the participation and involvement of important nongovernmental stakeholders, such as civil society representatives and academia.

The global governance landscape is highly fragmented and suffers from siloed approaches that lead to a lack of policy coherence.

Existing international conventions, organisations, and networks—much like ministries within national governments—are typically structured around specific policy themes or challenges. This siloed institutional design makes it challenging to take into account the interdependencies between different policy issues and to integrate synergies and trade-offs with adjacent issues in the institution’s agenda. The use of silos can ultimately lead to incoherent decisions and measures. For example, it has proven very difficult to integrate the role of materials (resources extracted from the earth), biodiversity, and nature in the UNFCCC negotiations. Some progress on this point was, however, made during the 2021 COP26 negotiations, in particular on forestry and forest-related commodities.

242 Shermon O. Cruz, “Alternative Futures of Global Governance: Scenarios and Perspectives from the Global South,” ed. Prof. Dennis R. Morgan, *Foresight* 17, no. 2 (April 13, 2015): 125–42, <https://doi.org/10.1108/FS-05-2014-0030>.

Another phenomenon that contributes to a lack of coherence is the multitude of different transnational governance initiatives led by nonstate actors, such as standards (e.g., for reporting and monitoring of environmental impacts), certifications, sector codes of conduct, and roundtables. Although the involvement of diverse nonstate actors—including international NGOs, business associations, and multi-stakeholder networks—is indispensable, the proliferation of different standards is considered problematic because it hampers the emergence of a more harmonised global system. A lack of comparability between different standards is at the expense of the transparency that consumers, businesses, and investors need to evaluate the sustainability of products, suppliers, and investment opportunities so they can make responsible decisions.

The current governance of international markets and value chains does not sufficiently incentivise sustainable resource use and does not reflect the true costs of natural resource extraction.

The interplay of current international market regulations and incentives tends to lead to prices that externalise environmental and social costs of resource extraction and goods production, thereby stimulating excessive use of resources, leading to overconsumption. These externalised costs, resulting for example from GHG emissions and pollution, are imposed on local communities and society as a whole. The resulting cheapening of natural resources also facilitates resource flows from LIC to HIC, thereby maintaining hidden neocolonial power dynamics, and stimulating unsustainable resource overconsumption.

Different dynamics of global markets exacerbate these market failures: High levels of competition and the resulting pressure to keep costs low; producer, retailer and customer priorities that tend to favour cost-efficiency and affordability over sustainability of commodities and products; state subsidies that artificially cheapen certain unsustainable commodities and might trigger further subsidisation in other countries; weaker policy frameworks or enforcement of social and environmental regulations in certain countries that make it possible to externalise these costs especially in upstream value chains; asymmetries in bargaining power between large multinational enterprises (MNE) and fragmented supplier groups within certain supply chains; as well as a lack of accessible and reliable information about externalised costs.

Addressing these market failures on an international level is hindered by a number of governance gaps on the one hand, and constraints from existing regulations on the other hand. These include:

1. Insufficient international coordination to provide consistent, high-quality data on resource use and its impacts.
2. A lack of international coordination on resource taxation that could capture the associated environmental costs in resource-rich countries while creating a level playing field in global trade.
3. International subsidies regulations that currently do not reflect environmental concerns, e.g., still allowing for the subsidisation of fossil fuels, and have not been successful in significantly reducing high trade barriers in high-income countries—especially for agricultural goods, and services—thereby limiting low-income countries' diversification potential.

4. The predominant design of trade agreements, that currently falls short of effectively lifting labour and environmental standards and supporting economic diversification in LIC, and often contains provisions that can shift the balance of benefits from states towards the investor,²⁴³ e.g., through far-reaching intellectual property rights and controversial investor-state dispute settlement provisions.²⁴⁴
5. The governance of competition through antitrust regulations which currently tends to prevent the cooperation needed for binding sector commitments to higher environmental and social standards.²⁴⁵

The international community lacks a shared understanding and joint targets regarding global resource use and fair distribution of benefits.

Predominant narratives on global resource consumption are framed around scarcity and increasing competition, as well as around international comparative advantages. These predominant competitive practices in most cases do not truly create economic “win-win” situations, as commodities are often supplied to those market players and regions that have a strong demand (usually high- and middle-income countries), while those that provide them benefit little, in particular the most vulnerable people within low-income countries. Thus, history has shown that “trickle-down” theory rarely works unless good governance is in place to guarantee that the benefits are shared across the population. These narratives are supported by the current conceptualisation of economic prosperity that is still based on GDP

growth and increased material consumption instead of the fulfilment of societal needs and an economic system founded on servicing a majority of the population, the planet, and widespread prosperity. Trickle-down theory is one of the narratives that has been used to justify appropriation of resources, precarious working conditions, and low compensation of workers in lower-income regions, and the concentration and individualisation of land ownership.²⁴⁶

“Trickle-down theory has been used to justify appropriation of resources, precarious working conditions and low compensation”

By contrast, the issues of a fair global distribution of benefits from resource extraction and the need to avoid and reverse the cheapening of labour and resources in LIC are not being sufficiently addressed by the international community and the current global governance system. Current discourses on climate protection also tend to neglect the link between clean energy provision and resource use, which exacerbates challenges and puts achieving global climate objectives at risk.

While there might be a joint understanding about the general need for decoupling global resource use from economic development to achieve sustainable levels, there still seems to be insufficient political will and leadership among HIC to radically reduce their resource use (while accepting the right of

243 Dani Rodrik, “What Do Trade Agreements Really Do?,” *Journal of Economic Perspectives* 32, no. 2 (May 1, 2018): 73–90, <https://doi.org/10.1257/jep.32.2.73>.

244 Investor-state dispute settlement provisions enable foreign investors to sue host governments for regulatory changes that reduce their profits.

245 Simone Holmes et al., *Competition Policy and Environmental Sustainability* (International Chamber of Commerce, November 26, 2020), 4, <https://iccwbo.org/content/uploads/sites/3/2020/12/2020-comppolicyandenvironmsustainability.pdf>.

246 Ian Scoones et al., *Narratives of Scarcity: Understanding the Global Resource Grab* (Future Agricultures, February 2014), 14–20, https://assets.publishing.service.gov.uk/media/57a089caed915d622c0003d3/FAC_Working_Paper_076.pdf.

LIC to increase theirs locally) or pay adequately for the resources they use so that middle- and low-income countries can be weaned off their debt and properly preserve the resources they have. This is reflected by the current lack of science-based international targets for effective resource decoupling and fair distribution—which might ultimately imply abandoning the prioritisation of constant GDP growth. In particular, there is a strong reluctance to discuss sufficiency approaches (e.g., scaling down unnecessary forms of production and resource use while maintaining the same levels for meeting societal needs). In comparison to efficiency approaches, sufficiency approaches are underrepresented in the international debate about global resource management.

4.3 OPPORTUNITIES TO OVERCOME GLOBAL GOVERNANCE CHALLENGES

The systemic problems in existing international institutions outlined above—the predominance of neo-liberal economic foundations, the paradigm of GDP growth, imbalanced LIC representation leading to insufficient legitimacy, and a fragmented and siloed approach—have been widely discussed

in academia and by practitioners, and various recommendations on institutional redesign have been brought forward. The principles and several of the system-level orientations outlined in this report contribute to the underlying theory of change for a new global governance architecture. Fundamental changes are needed to implement these principles, which will require broad support and political efforts over a longer-term time horizon.²⁴⁷ We shortly address respective approaches within the literature on institutional redesign of international organisations near the end of this chapter (Horizon 3).

The initial and primary focus of the chapter, however, is on viable approaches to resolving specific deficits of global economic governance, for which political support and windows of opportunity might open over a shorter- or medium-term time horizon. The following section explores how an adjustment of global market governance mechanisms could pave the way for implementing several system-level orientations outlined in this report, and which existing institutions and governance actors would need to play a role in implementing (Horizon 1). The authors will also consider the remaining gap with respect to global governance of natural resource use and examine different options for the creation of new institutional initiatives that focus explicitly on resource governance (Horizon 2).

247 The time needed to reach Horizon 1–3 depends on how long it takes to gather the broad political support and on the occurrence of political windows of opportunity.

FIGURE 22

Three horizons to implement recommendations to global governance systems

HORIZON 1

TAKING CONCRETE STEPS TO ADJUST INTERNATIONAL MARKET GOVERNANCE

Based on current global market governance, initiate specific adjustments—requiring cooperation of existing institutions and different actors

Accountability of multinational companies

International cooperation on fiscal policies

Green technology transfer & capacity building

Redesigning subsidies and tariffs with adverse environmental and distributional effects

Shifting financial incentives towards rewarding sustainable resource use

Competition and antitrust regulations to foster sector cooperation

HORIZON 2

BRIDGING THE INSTITUTIONAL GAP FOR GLOBAL RESOURCE MANAGEMENT

New governance arrangements and initiatives might be indispensable to agree on science-based targets that translate into clear guidance for resource use; leveraging international agenda-setting and coalition-building could pave the way

Strengthening the international agenda for resource governance

Transparent data on resource use and its impacts to underpin new governance

Innovative mechanisms for financing the global transition to sustainable resource use

HORIZON 3

WORKING TOWARDS INSTITUTIONAL REDESIGN OF EXISTING INSTITUTIONS

To strengthen legitimacy & coherence, the representation of low-income countries, and a paradigm shift from GDP to welfare metrics across international institutions

Strengthening legitimacy through just and diverse representation

Policy coherence and redefining guiding paradigms across international institutions

TABLE 3

Implementing the system-level orientations via the three horizons

COMPASS PRINCIPLE	SYSTEM-LEVEL ORIENTATION	HORIZON		
		1	2	3
		Adjusting International Market Governance	Bridging Institutional Gap for Global Resource Management	Institutional Redesign of Existing Institutions
Prosperity	Better leverage of fiscal policies for sustainable resource management	✓		
	Specific indicators for social, labour, and environmental standards and extended legal accountability for MNEs	✓		
Resource Use	Trade agreements that enable LIC's economic diversification	✓		
Progress	Integrate resource productivity logic in international institutions			✓
Metrics	Deployment of wellbeing indicator			✓
	Science-based international classification system	✓		
	International standards for risk assessment and for placing a value on nature and transparency of value chains	✓		
Competitiveness	International "just transition fund"		✓	
	Technological transfer, amnesties for intellectual property, fair share of the value created across the value chain	✓		
Incentives	Global standards incorporating environmental, social and risk costs of GHG emissions and resource extraction in the pricing of materials		✓	
	Phase out all harmful and unsustainable subsidies	✓		
	Measure ecosystem services at a global level and recognise their value financially		✓	

COMPASS PRINCIPLE	SYSTEM-LEVEL ORIENTATION	HORIZON		
Consumption	Minimum environmental and social standards for imports globally	✓		
	Risks of climate, nature, and biodiversity impacts as criteria for multilateral financial accounting	✓		
Finance	Shifting the global financial architecture, i.e., restructuring finance institutions			✓
	Formal international forum on stewarding global (virgin) resource use		✓	
Governance	Rebalancing institutional voting rights			✓
	Strengthen and rebuild trust and cooperation between Europe and lower-income regions	✓	✓	✓

Adjusting specific governance mechanisms that currently shape global value chains

Addressing specific gaps and constraints in international market governance can be an approach to help internalise climate and resource extraction costs, avoid resource overuse, and ensure fair wages and decent working conditions throughout value chains. The following section looks at the concrete steps that can be taken to implement specific system-level orientations that aim at transforming global market governance. These steps will also require cooperation and negotiations involving international organisations and transnational governance schemes. This analysis and its recommendations, however, must be seen in the political context: While the EU has the power to be a catalyst of system change, states are likely to push back and many in the EU itself will have political objections. Nevertheless, it is crucial that the EU accepts its international responsibility as a first mover and engages with those who oppose such shifts in the global governance system.

Creating an international level playing field by strengthening the accountability of multinational companies for upholding environmental and social standards along value chains

Foreign Direct Investments and global value chain integration drive economic growth and wellbeing in LIC, but at the same time, they can lead to environmental degradation, precarious working conditions, and human rights violations, given the often-weaker regulatory frameworks or lower capacities for enforcement in these countries.

Early attempts to establish a binding international code of conduct for multinational enterprises (MNEs) that would restrain them from taking advantage of these different levels of regulation failed in the late 1970s.²⁴⁸ Instead, a number of global voluntary standards and frameworks for corporate sustainability have emerged as transnational governance—the most prominent being the OECD Guidelines for Multinational Enterprises, the ILO Tripartite Declaration of Principles Concerning

248 Led by the UN Center for Transnational Corporations (UNCTC).

Multinational Enterprises and Social Policy, the UN Guiding Principles for Business and Human Rights (“Ruggie Principles”), the UN Global Compact, and the international ISO 26000 “Guidance on Social Responsibility” standard. Most of these frameworks have been developed through comprehensive multi-stakeholder consultations—driven by NGOs, trade unions, and global businesses themselves—and mix the commitment to upholding certain standards with guidance on how to implement, monitor, and report on them. Yet, the levels of uptake of these voluntary standards varies, and their effectiveness is contested, especially by NGOs that have repeatedly called for strengthening global corporate accountability.²⁴⁹

A 2020 assessment by the European Parliamentary Research Service concluded that introducing an EU-wide due diligence requirement covering human rights and environmental impacts for internationally operating companies would have substantial added value.²⁵⁰ In line with this assessment, this report suggests that the EU should introduce a legal liability for MNEs headquartered in the EU to safeguard social, labour, and environmental standards in foreign jurisdictions where their respective subsidiaries and main suppliers are located. These could build on the existing standards that are defined in voluntary frameworks, as well as the EU non-financial reporting directive on corporate responsibility reporting. An important factor for the implementation of such standards across value chains is enhanced transparency to monitor compliance.

To ensure successful implementation and create a level playing field, the EU could seek bilateral cooperation and leverage existing global governance networks:

- Initiate a multilateral conversation—either in G7/G20 groups or the OECD—on MNEs’ legal

accountability along supply chains that aims at an introduction in major markets. While the EU should avoid the risk of settling for the lowest common denominator in such a process, the alignment with other countries would create a true level playing field for global corporations and could significantly reduce resistance to the introduction of this legislation. Such a debate could be launched within the G7 or G20 groups—which would allow for more informal coordination—or under the auspices of the OECD, where it could build on the already established OECD Guidelines for Multinational Enterprises.

- Support the scaling and availability of technological solutions for improved transparency along value chains, such as blockchain-based product/service passports; support enhanced monitoring and enforcement through cooperation with governments in the “host countries” of EU-headquartered MNEs, as well as with NGOs and trade unions that have local networks; and collaborate with international business associations and multistakeholder networks to facilitate the implementation of the standards.

Launching international research and consultation efforts on how an intergovernmental cooperation on fiscal policies could contribute to a more just distribution of benefits from resource extraction.

While the environmental and social costs linked to resource extraction in resource-rich, low-income countries are oftentimes externalised, most financial benefits tend to remain with the MNEs operating in these countries. Good governance is needed to guarantee that the benefits are shared across the population. Fiscal policies are the classic tool for correcting market failures, such as externalised costs, and for redistributing benefits to society and communities.

249 Johanna Sydow et al., *Environmental Responsibility Through Supply Chains - Insights from Latin America* (Germanwatch, December 2021), 25-53, https://www.germanwatch.org/sites/default/files/environmental_responsibility_through_supply_chains_0.pdf.

250 Cecilia Navarra, *Corporate Due Diligence and Corporate Accountability-European Added Value Assessment* (European Added Value Unit, DG EPRS, October 2020), 62-65, [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/654191/EPRS_STU\(2020\)654191_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/654191/EPRS_STU(2020)654191_EN.pdf).

However, the competition for foreign investments between many LIC has partly triggered a “race to the bottom” of taxes as governments offer tax cuts and deregulations to attract investments. Due to the lack of a level playing field, countries with higher taxation could run the risk of weakening their international competitiveness. Also, the use of domestic tax policies and the capacities for enforcement vary significantly between countries, and there is currently no international coordination on the taxation of resource extraction or resource use. The question arises about which alternative options are available to resource-rich countries to maximising the returns from resource extraction, how tax systems would need to be reformed, and what kind of international cooperation is necessary to help curb overconsumption and reallocate benefits. For instance, these questions are being discussed regarding mineral resources in a multistakeholder dialogue on the future of resource taxation, jointly initiated by the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF), the International Institute for Sustainable Development (IISD), and the African Tax Administration Forum (ATAF).²⁵¹

Improved scientific evidence and a platform for dialogue among researchers, practitioners, and stakeholders could provide the necessary background for the launch of international negotiations on tax reforms—following the example of the ground-breaking 2021 agreement that addresses the tax challenges arising from the digitalisation of the economy by fundamentally reforming international tax rules. Under the auspices of the OECD, 137 countries (as of December 2021) agreed on allocating taxing rights in a way that takes into account the role of destination markets, as well as on a global minimum corporate tax rate of 15%. It is estimated that these changes will reallocate over

USD 125 billion of profits to markets where MNEs operate and generate profits.²⁵² However, since this reform is motivated by adjusting the taxation of digital services in destination markets, it does not affect the taxation of resource extraction.

To help internalise the environmental and social costs from resource use while also creating a level playing field in global trade, this report suggests that the EU could:

- Launch research efforts to provide evidence on how fiscal policies could be better leveraged for a fair distribution of benefits and sustainable resource management, and how global cooperation could support this.
- Initiate an international stakeholder consultation process, leveraging global governance fora such as the IGF, the Tax Justice Network, and OECD’s Inclusive Framework on Base Erosion and Profit Shifting that had hosted the abovementioned negotiations and brings together 141 member states that collaborate on tackling tax avoidance, improving the coherence of international tax rules and ensure a more transparent tax environment.²⁵³

Accelerating green technology transfer and capacity building by adjusting intellectual property rights (IPR) governance, trade agreements, and carbon and nature accounting systems

Accelerated technological transfer is key to ensure that lower-income countries can successfully leapfrog polluting technologies, quickly develop, or expand their capacities in environmentally friendly technologies, and benefit from emerging environmental provisions in trade agreements. Although trade liberalisation usually triggers technology spillover effects through increased

251 Isaac Agyiri Danso et al., “The Future of Resource Taxation: A Roadmap,” International Institute for Sustainable Development, October 17, 2020, <https://www.iisd.org/publications/future-resource-taxation-roadmap>.

252 OECD, “International Community Strikes a Ground-Breaking Tax Deal for the Digital Age,” accessed February 21, 2022, <https://www.oecd.org/tax/international-community-strikes-a-ground-breaking-tax-deal-for-the-digital-age.htm>.

253 OECD, “What Is BEPS?,” accessed February 21, 2022, <https://www.oecd.org/tax/beps/about/>.

economic cooperation, this technology diffusion tends to be slow, and without further efforts, the transfer of climate and circular technologies is not taking place fast enough.

This is partly due to strong protection of intellectual property rights, as these might increase licensing costs—thereby restricting access to the technology and associated knowledge. Strongly protected IPR may also prevent users from adapting technologies to suit their own requirements. In the context of climate technologies, LIC have therefore proposed that provisions on technology transfer should include patent pooling, royalty-free compulsory licensing of green technologies, excluding green technologies from patenting, and even revoking existing patent rights on green technologies.²⁵⁴ On the other hand, the assurance of adequate protection of IPR is often a precondition for many firms to transfer their technology to another country (by means of foreign direct investments and value chain integration) and therefore important to encourage technology diffusion.

While the commitment to facilitating technology transfers has been an element of global climate governance for years, the vague formulations provided by the UNFCCC make it difficult to determine noncompliance with technology transfer commitments and the role of IPR in this process. In the absence of a clear framework, stakeholders follow the guidance of patent regulations set by the WTO and the World Intellectual Property Organisation, in particular the trade-related intellectual property rights (TRIPS) agreement. TRIPS, as well, vaguely incorporates sustainable development ideals. While this leaves room for interpreting climate technology transfer to LIC as deserving special consideration, it is hardly practiced.²⁵⁵

“We need an accounting system that places a value on nature and incentivises its protection”

Another reason is the fact that currently predominant carbon accounting systems do not adequately take into account carbon leakages through international trade: Countries using a production-based carbon accounting system will have a smaller incentive to drive technology diffusion in countries with which they have a trade relationship. By contrast, consumption-based accounting includes the emissions that are emitted at home or in a foreign country, but which are embodied in the final products that are consumed at home. Similarly, an accounting system that places a value on nature and provides incentives for the protection of nature and biodiversity throughout value chains is needed (in market economics this is often referred to as “natural capital accounting”).

Finally, high investment costs and the need for capacity development to deploy and adapt the technology in LIC hampers technology transfer.

To adjust global governance mechanisms in a way that foster technology transfer, the EU could:

- Initiate a debate on the refinement of TRIPS provisions for climate-environmental purposes, which requires cooperation between the WTO and the UNFCCC.
- Ensure that trade agreements include provisions for close cooperation to foster an accelerated transfer of clean technologies, knowledge sharing and cooperative capacity building with LIC, and initiate international exchange of best practices on the implementation of environmental provisions

254 United Nations Framework Convention on Climate Change, *The Contribution of the Clean Development Mechanism under the Kyoto Protocol To Technology Transfer* (Bonn, Germany, 2010); United Nations Framework Convention on Climate Change, “What Is Technology Development and Transfer?,” accessed February 22, 2022, <https://unfccc.int/topics/climate-technology/the-big-picture/what-is-technology-development-and-transfer>.

255 Chen Zhou, “Can Intellectual Property Rights within Climate Technology Transfer Work for the UNFCCC and the Paris Agreement?,” *International Environmental Agreements: Politics, Law and Economics* 19, no. 1 (February 2019): 107–22, <https://doi.org/10.1007/s10784-018-09427-2>.

in trade agreements, e.g., under the WTO trade and environment committee, to discuss trade effects and settle tensions potentially resulting from such policies.

- Launch negotiations under the UNFCCC to shift carbon accounting from a production-based to a consumption-based accounting system, thereby incentivising faster technology transfer.

Phasing out or redesigning subsidies and tariffs with adverse environmental and distributional effects by adjusting WTO classifications and trade agreements and promoting reform efforts.

A large part of global and national subsidy revenues currently still goes to business activities that incentivise resource (over)consumption and land use changes, and have had adverse effects on biodiversity, climate, and inclusive development. For instance, fossil-fuel subsidies at a global level still amount to around USD 500 billion annually (as of 2021),²⁵⁶ and global levels of agricultural support amount to over USD 700 billion per year (as of 2020),²⁵⁷ only about 5% of which are dedicated explicitly to environmentally friendly land uses.²⁵⁸ Existing phase-out pledges by governments are voluntary in nature and often lack a clear deadline. Since subsidies can act as trade barriers, their use is regulated in international trade rules (WTO regulations) and trade agreements.

As the only global institution with binding rules to regulate subsidies, the World Trade Organisation (WTO) seems well-positioned to play a central role in banning harmful subsidies that undermine climate and sustainable resource use goals. Current international trade rules on subsidy use—based on the WTO classifications of permissible and restricted forms of subsidies—focus mainly on their role in

distorting international markets: Types of subsidy policies that lower market prices and disadvantage international competitors—e.g., support that is directly linked to production quantities—are banned, while less-distorting types, such as direct payments, are allowed. The adverse effects of certain subsidies on the environment and climate, however, have not played a role in WTO classifications so far.

Also, while there has indeed been some success in making subsidies less trade-distorting, overall subsidy levels remain high, and multilateral WTO negotiations on further liberalisation have been stalled, mainly due to continuing disagreement on the reduction of domestic support in high-income countries. In many countries, removing or reforming subsidies has proven extremely difficult as it creates strong resistance among the stakeholders that would potentially lose current benefits.

Tariffs on services and value-added products—another form of trade barriers that have been commonly used in trade agreements—have had negative distributional effects on LIC, as they have played a role in preventing countries that currently rely on resource-intensive exports from diversifying their economies. These restrictions therefore need to be adjusted in a way that does not merely integrate LIC into global value chains, but also allows them to claim a fairer share of the value creation within value chains. Following the example of the Comprehensive Economic Partnership Agreement (CEPA) between the European Free Trade Association (EFTA) and Indonesia, which grants preferential tariff treatment to certain agricultural products (e.g., palm oil) that meet sustainability requirements, this kind of preferential treatment could be applied to environmental services and environmentally friendly, value-added products from LIC.

256 Global Subsidies Initiative, “53 Ways to Reform Fossil Fuel Consumer Subsidies and Pricing,” accessed February 21, 2022, <http://www.iisd.org/gsi/subsidy-watch-blog/53-ways-reform-fossil-fuel-consumer-subsidies-and-pricing>.

257 OECD, *Agricultural Policy Monitoring and Evaluation 2020*, June 30, 2020, <https://doi.org/10.1787/928181a8-en>.

258 Timothy D. Searchinger et al., *Revising Public Agricultural Support to Mitigate Climate Change*, Development Knowledge and Learning (Washington, DC: World Bank, 2020), 46, <http://hdl.handle.net/10986/33677>.

To support necessary reforms and international policy learning, the EU could:

- Initiate WTO negotiations on the introduction of rules that ban subsidies with particularly negative environmental impacts—such as fossil fuel subsidies—following the example of the ongoing WTO negotiations on environmentally harmful fisheries subsidies and shift revenues from subsidies to social and environmental programmes. This effort could be accompanied by the launch of a more general debate on broadening the focus of the WTO. A wider approach would help align international trade rules with the protection of natural resources, decarbonisation, and a fairer distribution of economic benefits.
- Support knowledge sharing formats and networks to foster international policy learning: Facilitating the international exchange with peer countries can help overcome uncertainties among policymakers about the adverse effects of certain subsidies as well as the right policy design choices to reform them, e.g., compensation programs or successful examples of repurposing subsidies, e.g., the shift from traditional agricultural subsidies towards Payments for Ecosystem services programs, and other environmental support initiatives. Political support can be mobilised by engaging with and supporting existing networks and multistakeholder coalitions of change, such as the “Friends of Fossil Fuel Subsidy Reform”²⁵⁹—an informal group of countries aiming to build political consensus on a fossil fuel subsidy reform. There are also options like the IISD Global Subsidies Initiative (GSI)²⁶⁰ which supports international processes to align subsidies with sustainable development.
- Make it a standard to design trade agreements in a way that eliminates tariffs on services and instead includes preferential treatment of environmental services to foster economic diversification in LIC.

The phasing out of harmful subsidies could also be included in trade agreements. For instance, the Agreement on Climate Change, Trade and Sustainability (ACCTS) between Costa Rica, Fiji, Iceland, New Zealand, and Norway removes barriers to trade in environmental goods and services and phases out their fossil fuel subsidies.

Shifting financial incentives towards rewarding sustainable resource use by harmonising sustainable investment frameworks and reporting standards.

The criteria that shape financial capital allocation (be it through private investments, development finance, or insurance design) can be a powerful governance instrument for incentivizing more sustainable business decisions that contribute to resource decoupling and decarbonisation.

In private finance, the predominant approach to integrate sustainability considerations in investment and risk decisions is the use of ESG (environmental, social and governance) criteria—including respective reporting frameworks, and ratings of corporations, as well as financial vehicles and products like ESG funds. Another approach is impact investing which seeks out investment opportunities that are aligned with SDGs.

In public and development financing—e.g., through The World Bank, Multilateral Development Banks, and Development Financing Institutions—environmental and social risks linked to financing projects are assessed. For instance, the World Bank’s Environmental and Social Framework applies a set of standards to all projects and takes into account labour, non-discrimination, climate change mitigation and adaptation, biodiversity. However, there is still a risk that structural adjustment programs funded by these institutions that include market liberalisation efforts in LIC result in an imbalanced distribution of benefits from resource extraction.

259 Friends of Fossil Fuel Subsidy Reform, “What Is the Friends of Fossil Fuel Subsidy Reform?,” accessed February 21, 2022, <http://fffsr.org/>.

260 Global Subsidies Initiative, “About GSI,” accessed February 21, 2022, <http://www.iisd.org/gsi/about>.

Several international and multi-stakeholder initiatives play a role in the global coordination of sustainable financing frameworks. For instance, the UNEP Finance Initiative supports global finance sector principles through frameworks for responsible banking, sustainable insurance, and responsible investment. These initiatives were co-created with respective transnational stakeholders and are currently used by a significant share of the private finance sector. As for reporting frameworks used for ESG purposes, the Global Reporting Initiative (GRI) and the Task Force on Climate-Related Financial Disclosures (TCFD) are key reporting standards.

In 2021, G7 finance ministers made a commitment to make it mandatory for corporations to report climate impacts and investment decisions, thereby enhancing the comparability and data availability for ESG investing.

While sustainable financing criteria are still far from being applied sector wide, ESG criteria could be strengthened. This can address the lack of consistency and comparability between different frameworks, as well as the shortcomings of certain frameworks to include core metrics on sustainable resource use such as attempts under the EU Taxonomy, hamper effectiveness.

To address these challenges, the EU could:

- Upgrade the EU Taxonomy framework²⁶¹ and build on this work towards further harmonising and strengthening the classification of sustainable business activities internationally rather than weakening the definition of “green”—as a basis for both public and private investments. This process has already started through the International Platform on Sustainable Finance, launched by the EU to enhance international cooperation and

comparability and harmonisation of all regional taxonomies.

- Initiate efforts for a global harmonising of science-based metrics for risk assessment and ESG reporting to ensure consistency, credibility, and comparability of standards, and align criteria and reporting frameworks to include metrics on resource productivity/ impact footprint.
- Build on the G7 decision to mandate corporate climate reporting to launch a similar initiative in the G20 group.
- Adapt financing criteria of international investment institutions, the World Bank, Multilateral Development Banks, and Development Financing Institutions (DFIs) to ensure that all development aid reinforces local sustainable development pathways. For instance, International public finance for trade represents a large part—almost one quarter—of total official development assistance (ODA) and integrating sustainable resource use into trade-related ODA will help ensure that trade supports, or at least does not undermine, sustainable resource use. Similarly, in the context of structural adjustment programs funded by these international investment institutions, impact assessments should take into account the fair distribution of benefits from resource extraction and use.

Developing clear, practical, and consistent guidance on best practices in competition and antitrust regulations to foster sector cooperation on sustainability.

The business community is a key actor to succeed in the necessary transition of the economy. Moreover, it is widely acknowledged that collective action is needed.²⁶² Even though there is an increasing recognition among industry actors that planetary

261 Stockholm Environment Institute, “SEI Experts Dissect the New EU Taxonomy,” January 24, 2022, <https://www.sei.org/featured/sei-experts-dissect-the-eu-taxonomy/>.

262 OECD Guidelines for Multinational Enterprises: European Commission Decision, Case IV.F.1/36.718. CECED, January 24, 1999, para. 56, at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:per cent3A32000D0475>; European CEO Alliance, October 2, 2020, available at <https://www.volkswagenag.com/en/news/2020/10/European-CEO-Alliance-emphasizes-crossindustry-collaboration-to-fight-climate-change.html>. See also “The Urgency of Collaboration, with Paul Polman”, podcast, University of Pittsburgh Center for Sustainable Business, May 1, 2020.

boundaries must be respected, and the climate crises prevented actively,²⁶³ many are apprehensive to take the necessary actions. The reason is twofold: First, businesses fear a first mover disadvantage, i.e., they do not opt for the more sustainable alternative of sourcing raw materials as this might increase their costs while competitors relying on dirty raw materials might undercut their prices. Secondly, businesses fear unnecessarily restrictive or unpredictable competition law enforcement if they work together and coordinate their action towards transition with other competitors or partners in the value chains.

In some cases, the *fear* of not complying with antitrust and competition law might hinder a joint action of corporations even though it would be within the limits of allowed conduct. However, the risk of unpredictable and restrictive enforcement by antitrust authorities is a true barrier to collective action. Currently, there are a number of cases of antitrust authorities investigating business action that aims to improve environmental and social standards. One example is a proposed commitment of palm oil traders not to buy products from firms engaged in deforestation. The Indonesian antitrust authority is threatening action.²⁶⁴ Another recent example is the effort by car manufacturers to agree on higher vehicle emissions standards (in line with California standards). These are just the sort of cooperation agreements that are needed for a successful transition, although the vehicle emissions case was dropped, it was investigated by the US Department of Justice (DOJ) with inevitable chilling effects on similar initiatives.²⁶⁵

Building on its own recognition that cooperation between corporations is needed to advance sustainability,²⁶⁶ the EU could:

- Work together with the OECD and the International Competition Network (ICN) to enhance cooperation between national competition authorities on cross-border cases. The primary focus would be on facilitating convergence and identifying international best practice for sustainability efforts that businesses can follow.
- Develop clear, consistent, and EU-specific guidance on cooperation arrangements that do not raise concerns under competition and antitrust laws. This guidance can establish enforcement priorities for arrangements to meet sustainability objectives (with restrictions limited to ones that help achieve those objectives).²⁶⁷ Once cooperation agreements are established in Europe, they could then feed into efforts to facilitate coherence on an international level.

Bridging the institutional gap for sustainable global resource management

While significant progress can be made through changing the way existing governance mechanisms function, there remain gaps with respect to governance of natural resource management. In order to govern a coherent global transition to sustainable natural resource use, new governance

263 For example, Fabiana Negrin Ochoa et al., "The 100 Most Sustainably Managed Companies in the World," *Wall Street Journal*, October 13, 2020, sec. Business, <https://www.wsj.com/articles/the-100-most-sustainably-managed-companies-in-the-world-11602507298>; Dinae Holdorf and Claire O'Neill, "We CAN Create a World in Which 9+ Billion People Live within Planetary Boundaries, by 2050," WBCSD, June 24, 2021, <https://www.wbcsd.org/Overview/News-Insights/WBCSD-insights/We-CAN-create-a-world-in-which-9-billion-people-live-within-planetary-boundaries-by-2050>; "Deutscher Nachhaltigkeitskodex - Database," accessed February 22, 2022, <https://www.deutscher-nachhaltigkeitskodex.de/en-gb/Home/Database>.

264 Holmes et al., "Competition Policy and Environmental Sustainability," 5.

265 See, for instance, Julian Nowag, "The Antitrust Car Emissions Investigation in the U.S. – Some Thoughts from the Other Side of the Pond," Competition Policy International, July 28, 2020, <https://www.competitionpolicyinternational.com/the-antitrust-car-emissions-investigation-in-the-u-s-some-thoughts-from-the-other-side-of-the-pond/>.

266 European Commission, "European Industrial Strategy," accessed February 22, 2022, https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en.

267 Holmes et al., "Competition Policy and Environmental Sustainability," 14.

arrangements and initiatives are needed. These arrangements and initiatives must focus explicitly on resources and address current institutional gaps. Others are also calling for new, strengthened cooperation resource governance.²⁶⁸

Through focusing on resource use, the global policy community can demonstrate a new era of global governance. It can make both negotiation processes and eventual agreements/global targets more inclusive, engaging, and compelling than existing multilateral environmental agreements.

Strengthening the international agenda for resource governance

There is much that can be done through existing channels to shift the international dialogue and build an understanding among decision-makers across the political spectrum on the importance of resource management coupled with the enhancement of equity as a solution to our biggest planetary challenges.

Ambitious governments are already working to increase their impact and reach towards this aim, for example, the recently established Global Alliance on Circular Economy and Resource Efficiency (GACERE). Such a group can initiate multistakeholder dialogue on wicked problems, as these champions have the overall will to go beyond the basics and advance debates. A key objective of existing circular economy convening fora is disseminating the best examples of effective policy action—this can raise ambition among policymakers but must ensure that it targets the right audiences with high-impact information.

To address the challenge of inadequate understanding and low political will, champions of improved resource governance, with the EU as a leader, could shift mindsets and set the international agenda by:

- Using existing high-level platforms (such as conferences, and high-level roundtables) to leverage support for the needed shift in resource use and turn the conversation towards fairness in distribution of resources, shifting the debate from efficiency to sufficiency and stressing the need for economic shifts to foster equity and poverty eradication. By emphasising co-benefits, there is a real opportunity to bring together multiple actors who may not have previously shared common objectives.
- Fostering a group of global champions, including governments, civil society organisations, and business convening organisations, to form a high ambition coalition to build momentum towards the necessary resource transition. The “high ambition coalition” was crucial in the run up to the Paris Agreement. At the COP26 World Leaders Summit, a pledge signed by 137 countries possessing over 90% of the world’s forests, was announced and committed those countries to save and restore our planet’s forests. The deal also included a long list of commitments from public and private sector actors to combat climate change, curb biodiversity destruction and hunger, and to protect Indigenous peoples’ rights.²⁶⁹ The model of global champions is also being used ahead of new global biodiversity targets being set at CBD COP15.

268 Colette van der Ven, *An International Agreement on Natural Resource Management: An Overview of the Opportunities and Challenges* (TULIP Consulting, February 2022), 61, <https://www.tulipconsulting.ch/post/an-international-agreement-on-sustainable-resource-management>.

269 UN News, “World Leaders, Corporations at COP26 Take Major Step to Restore and Protect Forests,” accessed March 2, 2022, <https://news.un.org/en/story/2021/11/1104642>.

Resource Targets

Resource use is the main driver of all environmental impacts, significantly connected to social inequalities.

It is increasingly accepted across the globe that countries and businesses need clearer guidance in terms of sustainable resource use—both in terms of quality, e.g., more sustainable production, as well as in terms of quantity, i.e., how much of which material is sustainably available.

The clearest guidance are targets in terms of numbers. The climate change agenda has shown this with the 1.5°C target of global warming: A target from which one can calculate clear amounts of GHG emissions that can still be emitted—so called “carbon budgets.”

Finding such targets for natural resources is even more complicated than for GHG emissions. Different natural resources have different impacts on ecosystems and human health, and they have different impacts depending on how they are produced and consumed.

Therefore, the question is: What dimensions should resource use targets be set for? Should they be set in terms of the impacts which certain value chains or sectors cause through their material use (“impact footprints”)? This would, in principle, be feasible, as scientific methodologies are becoming available to associate environmental and human health impacts with specific materials throughout value chains. However, impacts per material and value chain are complex to define and measure, and give limited guidance for improvement strategies. Thus, targets for the resource-related impacts per value chain are needed, but would, on their own, arguably not give the required simplicity and clarity to guide the deep dematerialisation that is needed. As long as a target is defined only in terms of impact, it still leaves the (illusionary) option of improving performance by “cleaning” production, rather than reducing use and consumption in absolute terms—but we know both are needed. For example, a steel-to-vehicle value chain could attempt to improve its environmental performance by using green steel and modular steel elements—which is certainly important but will not be enough without the absolute reduction in steel consumption (given that even “green” steel has side effects for the environment, and the technology won’t be mainstreamed fast enough).

Therefore, there are calls for setting simple targets in terms of tonnes of specific materials (“material footprints”) to clearly guide the reduction (in high consuming countries) of resource use and limit it to sustainable levels in emerging economies. Such targets would have the advantage of clarity for the user. However, it will be a challenge to adjust such direct material-amount targets regularly to the changing impacts certain resources create with changing technologies, geographical circumstances, and competition for certain materials.

The International Resources Panel (IRP) is starting on such journey, but a more prominently mandated and well-funded group across science panels is needed to truly advance the feasibility and legitimacy of resource use targets.

New governance arrangements need to be underpinned by transparent data on resource use and its impacts.

If the existing global governance landscape stays in its current form, certain challenges will remain unless a new governance model is given a dedicated mandate to address them. One major challenge, not currently falling under the mandate of any international institution, is tracking global resource use, setting targets to limit damaging impacts, and monitoring their implementation. To effectively advance these actions, a new global governance model is needed. The absence of such governance is becoming more and more evident: UNEA resolutions have started asking for better governance of mining, chemicals, plastics, and other aspects of natural resource flows.²⁷⁰

The lack of coherence on monitoring resource use and its impacts leads to their continued overextraction and its negative impacts. While existing governance fora can be extended to include a resource management perspective, and to take equity into consideration, none of these fora is fit to provide the necessary systematic and consolidated transparency. Clear, science-based targets based on transparent data are a crucial element missing from the current global governance framework. The approach to monitoring could combine multiple data efforts, to ensure global coverage and methodological consensus. Having an internationally agreed database for resource use, and an agreed method for quantifying its impacts, is the bedrock on which further resource governance arrangements could build.

To understand what such governance could look like, parallels could be drawn with some current functions of the UNFCCC. Its main purpose, since the Paris Agreement in 2015, is to oblige states to set GHG emissions targets (through their NDCs), enable international financial cooperation to help reach those targets, and agree on shared standards

in terms of reporting and monitoring, and guidance for implementation. Its yearly Conferences of the Parties (COPs), as well as preparatory meetings, also serve as fora for states to show leadership, demonstrate implementation successes, and try to raise each other's ambition.

An initiative on resources could follow the principle of target-setting to limit impacts that would encourage states to set targets on resource use. It could also facilitate designing policies that systemically limit resource use by finding ways to deliver wellbeing benefits without extracting resources. Setting ultimate targets will be an iterative process, guided by the availability of globally comprehensive, high-quality data on resource use impact, and the human need delivered by resource-intensive systems. Target setting should also be guided by the principle of equitable distribution of human needs.

An explicit focus on resources and equity could represent a step change in impact. UNFCCC COPs (COP26 in Glasgow being the most recent example) tend to focus on supply-side interventions, which clean the current system without making systemic interventions. By focussing on resource targets, there is a real opportunity to address the drivers of multiple impacts together (such as GHG emissions, poverty, and unfair distribution of wealth), because resource use is responsible for multiple impacts which currently have separate targets (e.g., GHG emissions and biodiversity loss). Adding a resource focus to global governance mechanisms would mean that previously overlooked critical issues like overconsumption or perverse trade patterns enhancing poverty cycles in LIC would be directly considered.

“Adding a resource focus to global governance could address critical overlooked issues”

270 UNEA, “Adopted Resolutions at the Fourth Session of the UN Environment Assembly,” March 2019.

To aid efforts on monitoring and target setting, the EU could:

- Be a leader in the first steps towards global target setting by building on the agreement of the 2021 G20 Environment Ministers' meeting to find targets for a circular economy by resourcing a global scientific body to run a science-consolidation process outlining target ranges for sustainable resource use (the UN International Resource Panel has started exploring such targets).
- Establish itself as a convenor of willing countries, that, based on the best available resource use and impact data, can set resource consumption targets and mobilise others to do the same. It could be a powerful way of demonstrating that wellbeing can be maintained, or even improved, while resource depletion is reduced.

New governance arrangements can facilitate innovative mechanisms for financing the global transition to sustainable and equitable resource use.

A new governance initiative for resources could establish a dedicated global financing vehicle. Such a vehicle would channel funding for a transition to sustainable resource consumption and would be based on the system-level orientation on international sustainable resource financing. Such funding would also serve the purpose of increasing global equity, by channelling funds to those who have suffered the most damaging impacts from resource extraction. Targeted funding could transform resource value chains with precision: Coherent and transparent global data would enable identification of impact hotspots, which, with dedicated funding, could deliver positive social and environmental outcomes like maintaining people's livelihoods.

To ensure that a global financing vehicle delivers positive environmental and social outcomes, it will be important to make funding for ecosystem service delivery a priority. The importance of

data collection on the impacts of resource use and using the data to inform target setting has been emphasised: This should extend to impacts on biodiversity and ecosystem service delivery. There are significant gaps in existing biodiversity governance. Currently, there is no scientific standard to measure biodiversity impacts along value chains, which would enable countries—and companies—to measure the biodiversity impacts related to their resource consumption. As with climate impacts, the biodiversity impact of consumption in HIC is often outsourced to LIC. The International Resource Panel has started work towards a biodiversity impact standard in their Global Resources Outlook 2019. To ensure the legitimacy of such a funding mechanism, it is crucial for low-income producer countries to have a central role in its establishment, and the process through which it directs finances.

Financial transfers are an important tool to leverage in the transition to sustainable resource consumption, but if the transition is to be a truly just one, they must go hand in hand with fair resource prices. Prices should reflect the environmental and social costs of resource extraction and help to end the unfair transfer of wealth from LIC to HIC. Well-designed border adjustment taxes set by individual governments could contribute to fairer prices; however, any such mechanism will only be possible with commonly agreed resource and impact data.

Another crucial feature of any new global governance arrangement must be its democratic legitimacy. The challenge of lack of legitimacy due to insufficient representation of LIC's interests has been highlighted; new governance arrangements for natural resource use must distribute power evenly across global regions, not concentrate it purely where it has historically rested, or where economic activity is currently highest. Decisions should be based on genuine dialogue between producer and consumer countries and aim to arrive at a shared understanding of what sustainable resource use means for all involved.

To lead the way on global financing for nature-positive resource management, and be a leader in financing the implementation of resource use targets, the EU could:

- Establish itself as a convenor of willing countries, who, based on the best available resource use and impact data, can set resource consumption targets, and mobilise others to do the same. It could be a powerful way of demonstrating that wellbeing can be maintained, or even improved, while resource reduction is reduced.
- Start reporting on consumption-based biodiversity impacts with available methods, to be updated once a new shared standard is agreed.
- Demonstrate how to cooperate with countries and industries that currently experience or cause significant biodiversity loss related to products consumed in the EU, by jointly innovating for nature-positive value chains. For example, attractive plant-based foods produced in regenerative agriculture that delivers multiple ecosystem services simultaneously.
- Use pricing mechanisms as a key lever to meet its consumption-based targets for resource use and show its commitment to global equity by paying fair prices on its imports from LIC.
- Base its implementation of consumption-based resource use targets on genuine dialogue with the LIC it imports from, always seeking to maintain livelihoods and support alternatives to unsustainable employment (for example, by providing start-up capital to sustainable job opportunities).

Institutional redesign for the long-term improvement of key international institutions' legitimacy and effectiveness

The literature on the legitimacy of international organisations clearly identifies a “crisis in multilateralism” due to insufficient legitimacy and effectiveness of current key institutions. A number of publications draw the conclusion that the current institutional backbone of the global governance architecture—based on the post-war establishment of the Bretton Woods institutions, the UN Charter of 1945, and the signing of the General Agreement on Tariffs and Trade (GATT)—should be fundamentally reformed, as it still reflects the uneven distribution of power at that time. These publications call for a new international order based on an amended UN Charter that would give central place to fundamental principles of good governance.²⁷¹ Other scholars call for more incremental institutional reforms of existing international organisations. Both approaches, however, highlight the need for improved legitimacy and effectiveness of international institutions.

Strengthening legitimacy through just and diverse representation

A lack of legitimacy in the eyes of governments and citizens threatens institutions' long-term capacity to deliver outcomes and ensure compliance with international norms. From a normative perspective, the debate on international organisations' legitimacy is rooted in a fundamental concern about the democratic deficits in global governance—reflected, in particular, by imbalanced institutional decision-making processes that have disadvantaged many

²⁷¹ For example, Augusto Lopez-Claros, Arthur L. Dahl, and Maja Groff, *Global Governance and the Emergence of Global Institutions for the 21st Century*, 1st ed. (Cambridge University Press, 2020), <https://doi.org/10.1017/9781108569293>.

low-and middle-income countries. For instance, states' relative voice in decision-making modes of international institutions such as the WTO, the IMF, and the World Bank is criticised as opaque and undemocratic, as it does not reflect the political and demographic balance in the world.²⁷² The G7 and G20 groups have also met with legitimacy-related backlash, due to their exclusivity and membership criteria. In particular, the importance that these international fora give to the level of countries' GDP has contributed to shaping the distribution of power in the current global political system, and its partial failure to include perspectives that would be crucial to address pressing sustainability challenges. If these groups were to change their membership criteria towards replacing or complementing the level of GDP with wellbeing or sustainability criteria, the other aspects discussed in the context of democratic representation in international institutions are the participation and consultation of citizens, and the representation of youth. Consultation and other participatory governance approaches are considered to improve transparency of institutions' processes and decisions, and decision-making. As a step towards more democratic and proportional representation within the UN system, scholars have suggested establishing a World Parliamentary Assembly as an advisory body to the UN General Assembly.

Strengthening effectiveness through policy coherence and redefining guiding paradigms across international institutions

A major reason for policy incoherence between international institutions is the fact that—like government departments or company divisions—they are commonly organised into discipline-, issue-, or sector-based silos to simplify decision-making. This could be mitigated by promoting cooperation across silos and ensuring that these divisions have the necessary resources and capacity to do so. Apart from this, global governance scholars argue that stronger coherence could be achieved through more radical reforms that would make the international system fundamentally values-based, e.g., that a “new Bretton Woods” and amended UN Charter should give central place to certain core values, including principles of environmental stewardship and sustainability, that are effectively implemented across international institutions.²⁷³ This would allow institutions in global economic governance to shift from the key paradigm of maximising GDP levels towards rooting their activities in guiding principles based on wellbeing and environmental sustainability.²⁷⁴ For example, international economic institutions such as the WTO or IMF would support the implementation of the SDGs and align their activities in a way that contributes to these overarching values.²⁷⁵

“A 'new Bretton Woods' should include environmental stewardship and sustainability”

272 Jonas Tallberg and Michael Zürn, “The Legitimacy and Legitimation of International Organisations: Introduction and Framework,” *The Review of International Organisations* 14, no. 4 (December 2019): 581–606, <https://doi.org/10.1007/s11558-018-9330-7>.

273 Lopez-Claros, Dahl, and Groff, *Global Governance and the Emergence of Global Institutions for the 21st Century*.

274 Lorenzo Fioramonti et al., “Wellbeing Economy: An Effective Paradigm to Mainstream Post-Growth Policies?,” *Ecological Economics* 192 (February 2022): 107–261, <https://doi.org/10.1016/j.ecolecon.2021.107261>.

275 Ignacio Garcia Bercero, *What Do We Need a World Trade Organisation For? The Crisis of the Rule-Based Trading System and WTO Reform* (Bertelsmann Stiftung, May 28, 2020), 6, https://www.bertelsmann-stiftung.de/fileadmin/files/user_upload/MT_WTO_Reform_2020_ENG.pdf.

CONCLUSION

This report, together with the *SCC (2020)*, tackles how to achieve the objectives set in the EGD and the SDGs—a just transition towards a resilient future within the EU and globally. It unpacks and outlines the wicked problems and identifies the key international issues, tensions and trade-offs that will arise during the green and socially just transition and begins to identify possible solution pathways. Only if the drivers and pressures discussed in this report are addressed, can our global society achieve a sustainable future and become resilient to potential future shocks—whether they be extreme weather conditions due to our current level of GHG in the atmosphere, food insecurity or geopolitical crises and wars.

COVID-19 and the Russian invasion in Ukraine have put a spotlight on the failures of our system and harmful dependencies—highlighting vulnerabilities and fragilities. The time to address these is today. It is key to put in place today the policy targets and timelines that will make a difference in 2030 and get the EU and the world to true net-zero (net-zero carbon emissions, but also zero biodiversity loss, zero inequality and zero poverty) by 2050. Current generations in power cannot put the burden of action on future generations—nor afford to wait another 50 years. Today’s challenges need to be tackled head on, inconvenient truths need to be faced and openly communicated. The more the underlying strategic and sometimes difficult questions are ignored and avoided, including different trade-offs and delicate decisions, the more likely it is that crises will come back when Europe (and the world) are least prepared to face them, requiring potentially

“Europe cannot implement this system change alone: It needs its global partners”

even more dramatic responses. The EU and its leaders need to learn that simply trying to manage the symptoms will not cure the disease. It has never been more important to combine supply-side and demand-side policies to find nature-based solutions. Reducing the need for virgin natural resources is the best competitiveness policy for a continent like Europe, dependent as it is on energy and many other materials, including food crops.

Europe cannot successfully implement the required system change alone; it needs its global partners. This point of time is an opportunity to overcome (post-)colonial dependencies and face head on Europe’s responsibility: The EU must step up and build true partnerships with the low-income countries and the most vulnerable states acknowledging that it is Europe and other high-income countries that have predominantly caused climate change, biodiversity loss, and pollution, as well as many current socio-economic problems. Europe should not hide behind platitudes and short-term thinking but develop clear policies that address these problems—by walking the talk at home and terminating overconsumption in the EU but also by being a real partner to other countries in their own transitions. Collaboration between the different nations and mutual knowledge sharing is key, as is ensuring transparency and inclusion in decision-making processes. This is not a one-way street—while

“The EU must invest in avoiding future crises”

being a catalyst for system change, the EU needs to be humble and listen and learn from countries that have not gone down the road of overconsumption yet: Ubuntu, Tao, and indigenous worldviews are as necessary as the life-inspired elements of modern science such as cybernetics, complexity thinking or evolutionary biology.²⁷⁶

To that end, this report brings forward three key takeaways:

- First, to create the green and socially just future that the EGD seeks to achieve and booster its resilience, the EU must work towards system change in international relationships and use this as an opportunity to display truly transformative leadership at home and globally. Current debates about EGD implementation do not sufficiently consider its international implications, including on global industrial value chains, international finance, and bilateral trade.
- Second, following Russia’s invasion of Ukraine and the consequent energy and materials crisis in Europe, the EU must invest in avoiding future crises through decarbonisation and reduced resource consumption. In the absence of such a reduction in resource usage, Europe will trade one resource dependency (on fossil fuels) for another (renewables materials, including rare earth elements, for which EU is 99% dependent on imports from China).
- Third, the EU needs to find a new balance between retaining productive industry at home while also enabling a just transition globally. It is time to end the hidden resource imperialism.

This report is intended to be a compass for policymakers. A compass that unveils the wicked international problems of European Green Deal achievement and offers inspiration for some solution pathways. It is, however, only one part of the necessary conversation between the international partners written mainly by EU experts. The authors invite voices from other parts of the world, especially from resource-rich lower and middle-income countries to join this conversation. Together we can shape the future towards a green and socially just transition.

The possible future in line with the compass transitions is about much more than just avoidance of extreme catastrophes. It provides an opportunity to reshape our relations with nature, people, and time and is marked by a new quality of life supported through well-functioning, accessible, clean, and healthy systems of mobility, housing, food, and everyday goods. It is marked by better communities and less loneliness, by free time to dedicate to creativity, movement, and relationships, the convenience of reduced waste and pollution, and by better social cohesion, exchange, and reduced conflict. The knowledge exchange between states, the recentring to the connection between people, planet, and prosperity paired with learning from indigenous and young people as well as with the fast developing technological and digital innovations of the years to come are crucial. It must not be only focused on “cleaning up” current—inefficient and unfair—production and consumption patterns in high-income countries, but an effort towards the required system change to an inherently sustainable and equitable quality of life. For a green and socially just transition. For a liveable environment and enjoyable future. For people, planet, and prosperity.

“This is not just about cleaning up production and consumption, but about reshaping our relations with nature and people”

276 The Club of Rome, “*Emerging New Civilisations*”, accessed March 22, 2022, <https://www.clubofrome.org/impact-hubs/emerging-new-civilization/>.

GLOSSARY

TERMS

“As a service business models”	Everything-as-a-Service or X-as-a-Service (XaaS) is an umbrella term for all types of products (software/hardware) offered in service-oriented business models. Everything-as-a-Service (XaaS) models combine tangible products and intangible services so that they are jointly capable of satisfying final user needs. In XaaS models, producers typically maintain product ownership and lifecycle responsibility and are consequently incentivized towards adopting circular economy strategies (long-lasting and circular design, use-phase intensification, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling).
Circular Economy	A model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible.
Decarbonisation	The process of reducing carbon dioxide (CO ₂) emissions resulting from human activity in the atmosphere.
Dematerialisation	Refers to the absolute or relative reduction in the quantity of materials used and/or the quantity of waste generated in the production of a unit of economic output.
Domestic Material Consumption (DMC)	Abbreviated as DMC, measures the total amount of materials directly used by an economy and is defined as the annual quantity of raw materials extracted from the domestic territory, plus all physical imports minus all physical exports.
Ecosystem Services	The benefits provided by ecosystems that contribute to making human life both possible and worth living. Examples of ecosystem services include products such as food and water, regulation of floods, soil erosion and disease outbreaks, and non-material benefits such as recreational and spiritual benefits in natural areas.
Global Governance	Refers to the complex of rules, policy interventions, and institutions that are used to manage international and transnational interactions within and among the state, civil society, and the private sector. In contrast to the narrow definition of governance exclusively focused on non-hierarchical modes of steering society and private transnational actors, we apply the more comprehensive understanding which comprises hierarchical as well as public-private and private modes of governance and considers their interactions.
Human/societal needs	Social need is any essential need for the survival and the progress of the individuals (or the society as a whole) and its derivatives. Examples of social needs include food and water, energy, health protection and medication, education, transportation, employment, safety, and security. As with the <i>System Change Compass (2020)</i> , this report focuses on those societal needs that are resource intensive (“resource related needs” or the like) (see <i>System Change Compass [2020]</i>)
International Relations	The study of the relations of states with each other and with international organisations and certain subnational entities (e.g., bureaucracies, political parties, and interest groups).

Just Transition	The just transition concept recognizes that the transition towards environmentally sustainable economies can come with major social challenges, such as the displacement of workers and possible job losses, and higher energy and commodity prices for poor households. A just transition entails the deliberate effort to plan for and invest in a transition that contributes to the goals of decent work for all, social inclusion, and the eradication of poverty. It therefore seeks to ensure that the substantial benefits of a green economy transition, e.g., new business opportunities, are shared widely, while also supporting those who stand to lose economically—be they countries, regions, industries, communities, workers, or consumers.
Low/high/middle-income countries	For the current 2022 fiscal year, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of USD 1,045 or less in 2020; lower middle-income economies are those with a GNI per capita between USD 1,046 and USD 4,095; upper middle-income economies are those with a GNI per capita between USD 4,096 and USD 12,695; high-income economies are those with a GNI per capita of USD 12,696 or more.
Materials	The elements, constituents, or substances of which something is composed or can be made.
Material Footprint	The attribution of global material extraction to domestic final demand of a country. The total material footprint is the sum of the material footprint for biomass, fossil fuels, metal ores, and nonmetal ores.
Natural Assets	When speaking about “assets,” this report means something that provides societal value by enabling better functions, such as biodiversity preventing erosion and improving the quality and resilience of crops.
Nature-Based Solutions	Actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human wellbeing and biodiversity benefits.
Natural Capital	The world’s stocks of natural assets which include geology, soil, air, water, and all living plants and animals. In today’s market economy the only way one can “value nature” is by assigning nature (e.g., water and forests) monetary value. While providing a valuable short-term lever for the protection of nature within the current system, conversations around nature markets and accounting also carry a risk of further engraining the unsustainable relationship between nature and economy. After all, it perpetuates the idea that in our society everything of value must be measured by its monetary or economic worth. Ultimately, the only way to truly address the historical imbalance is through a radical departure from traditional monetary growth indicators towards a system that allows us to value nature for all that it offers us, without needing to equate “value” with a single measurable metric—like carbon emissions or offsets.
Natural resources	Natural resources are all the land, forests, energy sources and minerals existing naturally in a place.
Natural resource materials	This is everything extracted from the earth that can then be processed into other things like minerals, metals, biomass, fossil fuels and rare earths.

Natural Resources/ Natural Resource Management	When speaking about “natural resources,” the definition by the International Resource Panel is used. It refers to metals, minerals, fossil fuels, biomass, water, and land. These resources can be tracked as flows through the economy: from extraction, through processing and consumption, to point of reuse or discarding at end-of-life. When referring to “natural resource management” and its approaches, we refer to strategies and tools to secure the sustainable use of these “natural resources.”
Net-zero	Net-zero means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance (to be differentiated from “true net-zero”).
Planetary Boundaries	Concept aimed to define the environmental limits within which humanity can safely operate.
Policy	A law, regulation, procedure, administrative action, incentive, or voluntary practice of governments and other institutions. Policy decisions are frequently reflected in resource allocations.
Resources	Services or other assets used to produce goods and services that meet human needs and wants.
Sufficiency	An approach to sustainable consumption that argues that reducing ecological footprints requires high-consuming classes to change their consumption patterns and reduce their consumption levels. It comprises notions of a good life with a sufficient level of welfare and of good work. It combines them with concepts such as the Earth’s carrying capacity measured as planetary boundaries, the safe operating space, the energy-emissions trap, environmental space with upper and lower boundaries, overshoot/overconsumption, a social protection floor, and degrowth.
Politics	Activities that relate to influencing the actions and policies of a government or getting and keeping power in a government.
Quality of life	The degree to which an individual is healthy, comfortable, and able to participate in or enjoy life events.
System Change Compass (2020) [SCC (2020)]	<i>The System Change Compass (2020)</i> by SYSTEMIQ and The Club of Rome provides guidance for a systemic realisation of the EGD and demonstrates how radical resource decoupling, dematerialisation, decarbonisation, and rethinking ownership can lead to human wellbeing and economic resilience.
True net-zero	True net-zero includes not just net-zero carbon emissions, but also zero biodiversity loss, zero inequality, and zero poverty.
Wellbeing	Wellbeing is the experience of health, happiness, and prosperity. It includes having good mental health, high life satisfaction, a sense of meaning or purpose, and ability to manage stress.
Stewardship of products	An environmental management strategy in which whoever designs, produces, sells, or uses a product takes responsibility for minimising the product’s environmental impact throughout all stages of the product’s life cycle, including end of life management. The greatest responsibility lies with whoever has the most ability to affect the full life cycle environmental impacts of the product. This is most often the producer of the product, though all within the product chain of commerce have roles.

ABBREVIATIONS

ACCTS	Agreement on Climate Change, Trade and Sustainability
AI	Artificial Intelligence
CBAM	Carbon Border Adjustment Mechanism
COP	Conference of Parties
CEPA	Countries Comprehensive Economic Partnership Agreement
CO ₂	Carbon Dioxide
DFIs	Development Financing Institutions
DG AGRI	Directorate-General for Agriculture and Rural Development
DG CLIMA	Directorate-General for Climate Action
DG ECHO	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DG ENER	Directorate-General for Energy
DG ENV	Directorate-General for Environment
DG FISMA	Directorate-General for Financial Stability, Financial Services and Capital Markets Union
DG INPTA	Directorate-General for International Partnerships
DG MOVE	Directorate-General for Mobility and Transport
DG NEAR	Directorate-General for European Neighbourhood Policy and Enlargement Negotiations
DG REFORM	Directorate-General for Structural Reform Support
DG REGIO	Directorate-General for Regional and Urban Policy
DG TRADE	Directorate General for Trade
EC	European Commission
EEAS	European External Action Service
EGD	European Green Deal
EFTA	European Free Trade Association
ESG	Environmental, Social and Corporate Governance
EU	European Union
FPI	Service for Foreign Policy Instruments
GACERE	Global Alliance for Circular Economy and Resource Efficiency
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GHG	Green House Gasses
GRI	Global Reporting Initiative
GSI	Global Subsidies Initiative
HC	Human Capital
HIC	High-Income Countries

ICN	International Competition Network
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IPR	Intellectual Property Rights
IRP	International Resources Panel
LIC	Low-Income Countries
MDBs	Multilateral Development Banks
LMIC	Lower Middle-Income Countries
MNE	Multinational Enterprise
NATO	North Atlantic Treaty Organisation
NC	Natural Capital
NbS	Nature-based Solutions
NDCs	Nationally Determined Contributions
NO _x	Nitrogen Oxides
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PC	Physical (or financial) Capital
SDGs	Sustainable Development Goals
SCC	System Change Compass
TCFD	Task Force on Climate-Related Financial Disclosures
TRIPS	Trade-related Intellectual Property Rights
UNFCCC	United Nations Framework Convention on Climate Change
UNEA	United Nations Environmental Assembly
UNEP	United Nations Environment Programme
WEEE	Waste from Electrical and Electronic Equipment
WTO	World Trade Organisation

EUROPEAN GREEN DEAL INITIATIVES AND REGULATION

Carbon Border Adjustment Mechanism (CBAM)

https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3661

The CBAM system will work as follows: EU importers will buy carbon certificates corresponding to the carbon price that would have been paid, had the goods been produced under the EU's carbon pricing rules. Conversely, once a non-EU producer can show that they have already paid a price for the carbon used in the production of the imported goods in a third country, the corresponding cost can be fully deducted for the EU importer. The CBAM will help reduce the risk of carbon leakage by encouraging producers in non-EU countries to green their production processes.

The CBAM will be phased in gradually and will initially apply only to a selected number of goods at high risk of carbon leakage: iron and steel, cement, fertiliser, aluminium, and electricity generation.

Digital4Development

<https://futurium.ec.europa.eu/en/Digital4Development/library/digital4development-mainstreaming-digital-technologies-and-services-eu-development-policy>

Strategy aimed to mainstream digital technologies into EU development policy, contributing to the achievement of the SDG.

EU Taxonomy

Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088

A classification system, establishing a list of environmentally sustainable economic activities. It would provide companies, investors, and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable. In this way, it should create security for investors, protect private investors from greenwashing, help companies to become more climate-friendly, mitigate market fragmentation, and help shift investments where they are most needed.

Global Gateway Strategy

https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6433

The new European strategy is set to boost smart, clean, and secure links in digital, energy, and transport sectors and to strengthen health, education, and research systems across the world, leveraging infrastructure investments in EU's partner countries

Between 2021 and 2027, the EU institutions and EU member states jointly, will mobilise up to EUR 300 billion of investments in:

- digital
- climate and energy
- transport
- health
- education and research

Proposal for a Regulation on deforestation-free products

https://ec.europa.eu/environment/publications/proposal-regulation-deforestation-free-products_en

The proposal seeks to prohibit placing or making available on the EU market as well as exporting from the EU certain commodities and products associated with deforestation and forest degradation.

The proposal currently covers six commodities deemed to be the most relevant in terms of driving global deforestation and forest degradation and certain products that contain, have been fed with or have been made using such commodities. At this stage, the proposal would therefore apply to the following commodities: cattle, cocoa, coffee, oil palm, soya, and wood. It would also apply to certain products made from these commodities, such as cattle meat, leather, chocolate, soya-bean oil, oilcakes, plywood, and wooden furniture.

Sustainable Corporate Governance

https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12548-Sustainable-corporate-governance_en

Commission adoption planned for fourth quarter 2021

This initiative aims to improve the EU regulatory framework on company law and corporate governance. It would enable companies to focus on long-term sustainable value creation rather than short-term benefits. It aims to better align the interests of companies, their shareholders, managers, stakeholders, and society. It would help companies to better manage sustainability-related matters in their own operations and value chains as regards social and human rights, climate change, and the environment.

Sustainable Products Initiative

https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative_en

Commission adoption planned for first quarter 2022

This initiative, which will revise the Ecodesign Directive and propose additional legislative measures as appropriate and aims to make products placed on the EU market more sustainable.

Consumers, the environment, and the climate will benefit from products that are more durable, reusable, repairable, recyclable, and energy efficient. The initiative will also address the presence of harmful chemicals in products such as:

- electronics & ICT equipment
 - textiles
 - furniture
 - steel, cement & chemicals
-

WEEE Directive

Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

EU rules on treating waste electrical and electronic equipment, to contribute to sustainable production and consumption.

The Directive:

- requires the separate collection and proper treatment of WEEE and sets targets for their collection as well as for their recovery and recycling.
- helps European countries fight illegal waste exports more effectively by making it harder for exporters to disguise illegal shipments of WEEE.
- reduces the administrative burden by calling for the harmonisation of national EEE registers and of the reporting format.

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