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MAKING CLIMATE TARGETS ACHIEVABLE

Improving Wellbeing through Reduced Absolute Resource Use

ACKNOWLEDGMENTS

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Today, Janez Potočnik and Izabella Teixeira are colleagues as Co-Chairs of the International Resource Panel (IRP). For over a decade, they have collaborated as friends in their respective roles as negotiators for sustainability-related United Nations conferences and conventions. They have distilled that decade of experience into clear, science-based and policy relevant principles informed by the research of the IRP.

To the world's efforts to address climate change, they add an indispensable missing piece: resource efficiency strategies to reduce and improve the use of natural resources. *This opinion piece supplements the previous* Building Biodiversity *paper published last year. Together, these opinion pieces highlight how natural resources sit at the heart of the triple planetary crisis and provide a picture of hope: using fewer natural resources offers major opportunities to deliver solutions for all countries that address all aspects of the crisis together.*

Sharing lessons from their past and present roles, and based on powerful scientific evidence from the IRP and beyond, the Co-Chairs urge parties to push for bold global action on resource efficiency. ***Countries must apply resource efficiency broadly, going beyond decarbonization to reduce the overall use of natural resources according to country circumstances, so that economic prosperity and wellbeing can be achieved while environmental pressures and impacts are reversed.***

Janez Potočnik and **Izabella Teixeira**
Co-Chairs of the International Resource Panel

An absolute reduction in the use of natural resources is indispensable to meet climate change, biodiversity and pollution ambitions

We are wholly dependent on natural resources (land, water and materials)[1] to meet all our wellbeing needs: from food and shelter to transport and energy systems and everything that helps us to thrive in between. However, current production and consumption systems are causing the transgression of planetary boundaries,[2] with catastrophic impacts on our planet, our health and our wellbeing.

The world finds itself facing a triple planetary crisis of climate change, biodiversity loss and pollution and waste, driven by unsustainable consumption patterns.

Research by the International Resource Panel (IRP) has found that the unsustainable use of natural resources, in particular by high-income countries, lies at the heart of this triple planetary crisis. Our natural resource use is responsible for one-half of total global greenhouse gas emissions; more than 90 per cent of land-related biodiversity loss and water stress; and one-third of health-related pollution impacts (IRP, 2019).

The IRP's analysis further reveals that global material extraction is on a dangerous trajectory: it has tripled since 1970, while global material productivity has mostly declined during the last two decades and has lately stagnated. This means that we are now deriving less economic output and less value from each ton of material extracted. And without transformative change, material extraction will double again by 2060 (IRP, 2019).

Once we understand that natural resource use is at the heart of the triple planetary crisis, we can unlock major opportunities to deliver solutions which address all aspects of the crisis together.

1 "Material resources are defined as biomass (like crops for food, energy and bio-based materials, as well as wood for energy and industrial uses), fossil fuels (in particular coal, gas and oil for energy), metals (such as iron, aluminium and copper used in construction and electronics manufacturing) and non-metallic minerals (used for construction, notably sand, gravel and limestone)" (IRP, 2019).

2 The IRP Global Resources Outlook 2019 explains that the uptick in natural resource use has contributed to a situation where four out of nine of the planetary boundaries are surpassing their recommended limits (IRP, 2017; Rockström et al., 2009; Steffen et al., 2015). The planetary boundaries framework, which is based on the understanding of the long-term behavior of the Earth system, underscores why it is necessary to change how natural resources are currently being used and managed. A global society living outside of the planetary boundaries may lead to an altered and less hospitable Earth (Steffen et al., 2015). Two of the planetary boundaries—climate change and biosphere integrity (including biodiversity loss),—are regarded as core boundaries because the coevolution of life on Earth and the physical climate are defining aspects of the Earth system. Due to the interactions and feedbacks between life and climate, transgression of either boundary has the potential to cause changes to the entire Earth system (Steffen et al., 2015).

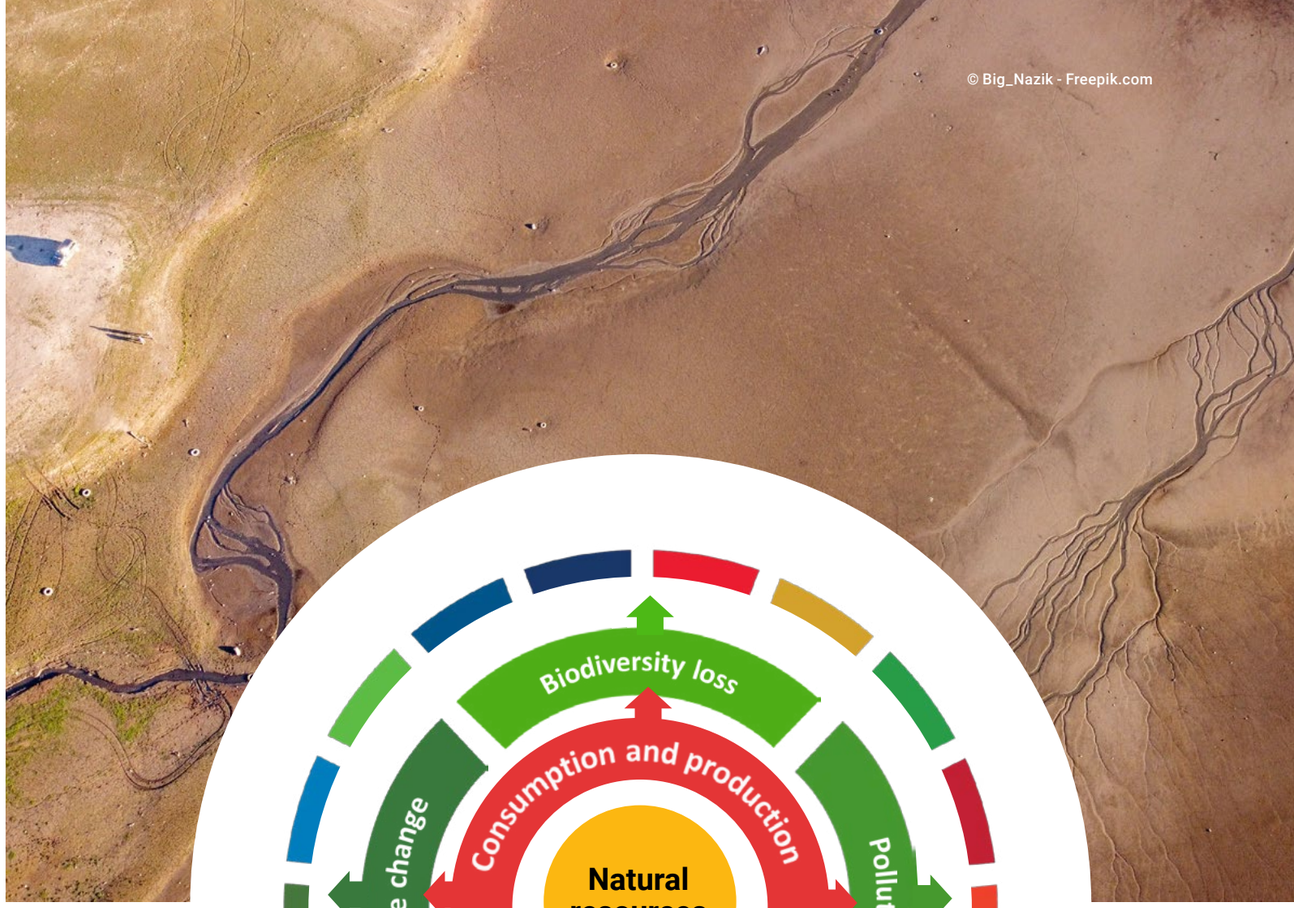


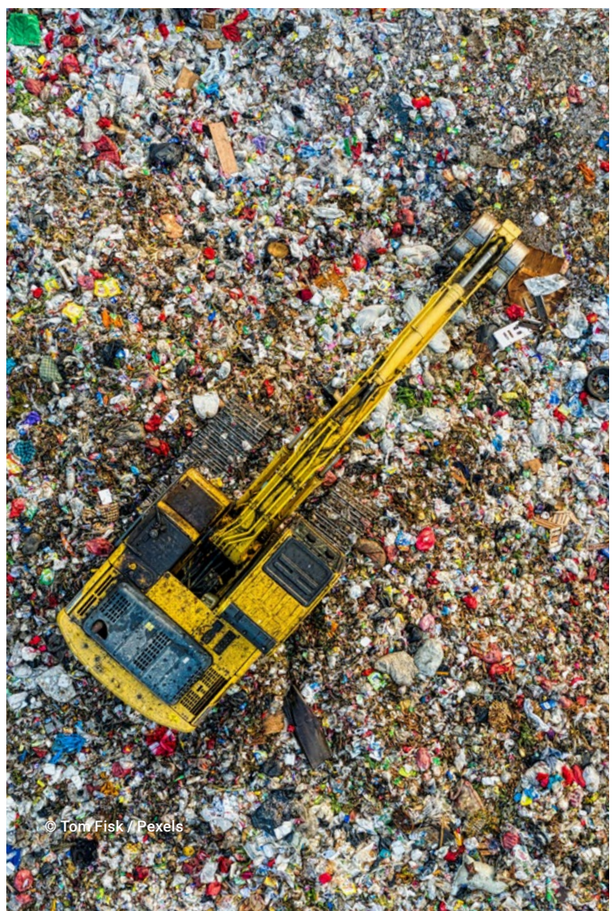
Figure 1 Natural resources underpin human consumption and production systems, and are intertwined with climate, biodiversity and pollution/health (IRP, 2021).

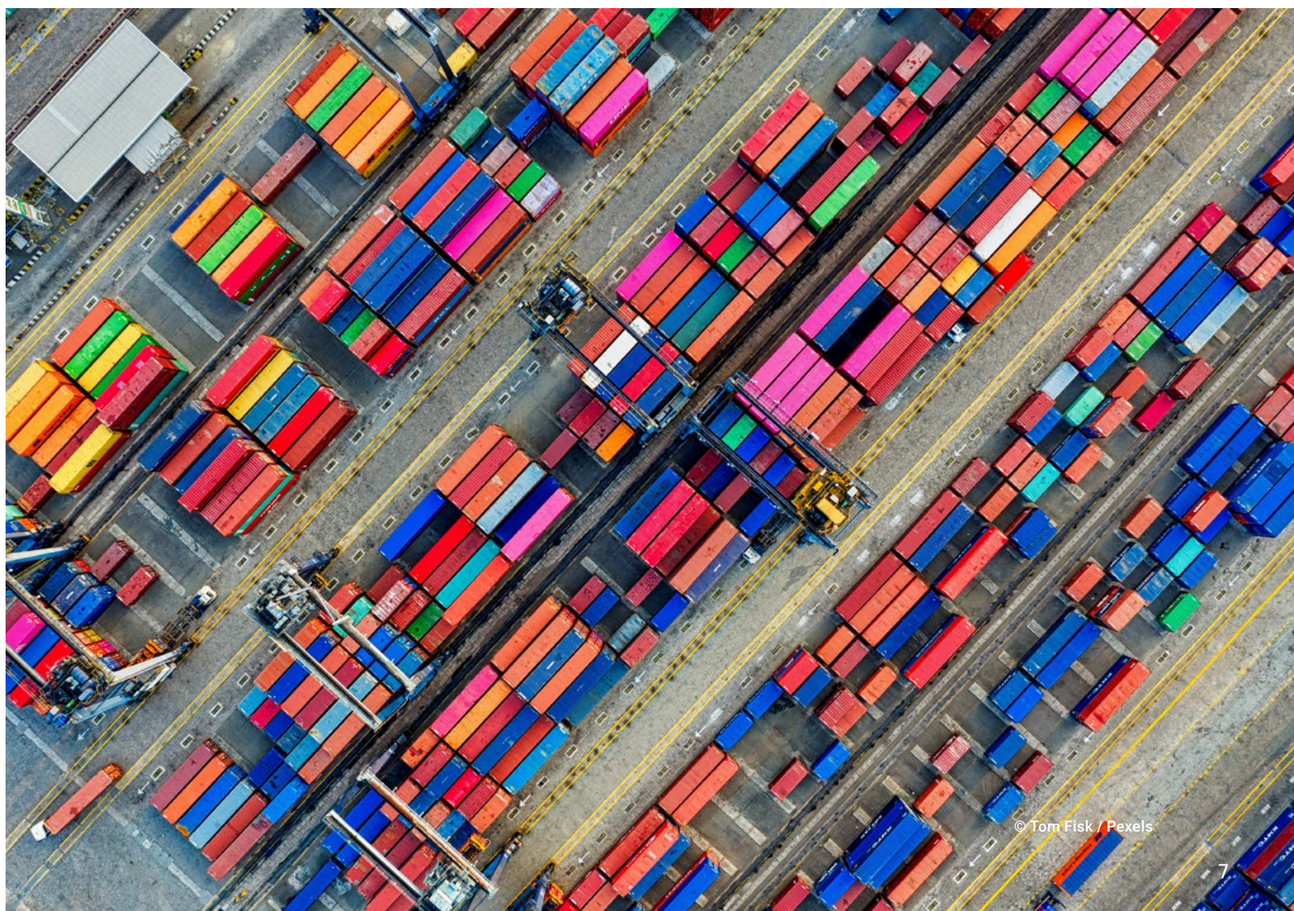
Natural resource use in high-income countries is a key driver of the triple planetary crisis and must be urgently reduced

Our current exploitation and use of natural resources are characterized by deep inequalities. High-income countries benefit most from the planet's natural resources; while low-income countries face the outsized burden of the negative impacts of extraction and processing to satisfy demand in the Global North.

The average person in a high-income country has a material footprint[3] which is 60 percent greater than that in an upper-middle income country and over 13 times greater than that in a low-income country (IRP, 2019). The IRP further links material extraction—wherever it may physically take place—through global production chains to end consumers and finds that the trade of high-income countries in 2017 was equal to a net virtual transfer from elsewhere in the world into this group equivalent to 11.8 billion tons of primary extraction (IRP, 2019).[4]

Today, more than 10 percent of the world's population suffer from extreme poverty, struggling to meet their most basic needs as defined under the UN Sustainable Development Goals (SDGs). This once again highlights how resource-related benefits are not shared equitably and do not adequately serve the most vulnerable among us, including those from some biodiversity and natural resource-rich countries. Meeting basic needs is intrinsically linked to the use of natural resources; and it is of utmost importance that these resources contribute equitably to wellbeing across the global population in a way that supports development in middle- and low-income countries.





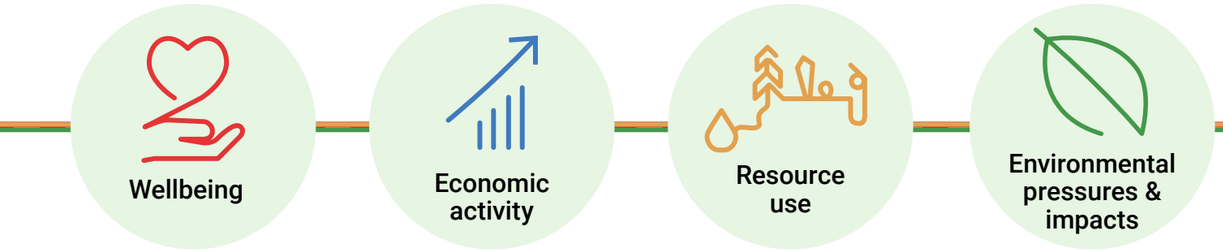
3 This term is used to represent the whole system of environmental pressures exerted by human activity, including direct pressures occurring within the geographical boundary where the activity occurs and indirect/or supply chain pressures beyond (i.e., transboundary pressures). The material footprint encompasses all material resources used (IRP, 2019).

4 The raw material trade balance metric considers the embodiment of materials that did not physically cross borders with traded goods, but that were nevertheless required for their production. This links material extraction—wherever it may physically take place—through global production chains to end consumers in a way that cannot be achieved using direct physical trade metrics (IRP, 2019).

To meet sustainability goals, including climate targets, we must go beyond decarbonization and decouple wellbeing from resource use and environmental impacts

While decarbonization of production has a critical role to play in mitigating carbon emissions and climate change, we need to factor in other vital strategies to address the challenges we face. If it is applied in isolation, it may cause unintended consequences for other planetary boundaries due to continued global reliance on increasing resource use.

An absolute reduction in resource use is crucial both to realize decarbonization efforts and to halt and reverse the depletion of the natural assets and ecosystem services that are essential to meet our societal, economic and environmental needs. However, this does not translate into blanket reductions in all global contexts: instead, high-income countries should reduce their resource use while aiming to maintain or increase wellbeing through "absolute decoupling"; and low and middle-income countries should increase resource use at a comparatively slower rate while aiming to increase wellbeing through "relative decoupling." IRP modeling undertaken for the 2019 Global Resources Outlook shows that by 2060, with the right resource efficiency and sustainable production and consumption policies in place, economies could still grow even with a 25 percent reduction in global resources use. These projections are based on the understanding that meeting growing human needs in emerging and developing economies should be balanced by absolute reductions in resource use in developed countries (IRP, 2019). More ambitious policies, in line with the concepts explained here, could of course translate into even greater reductions in resource use.



Resource use to meet growing human needs in emerging and developing economies should be balanced by absolute reductions in resource use in developed economies (IRP, 2019).

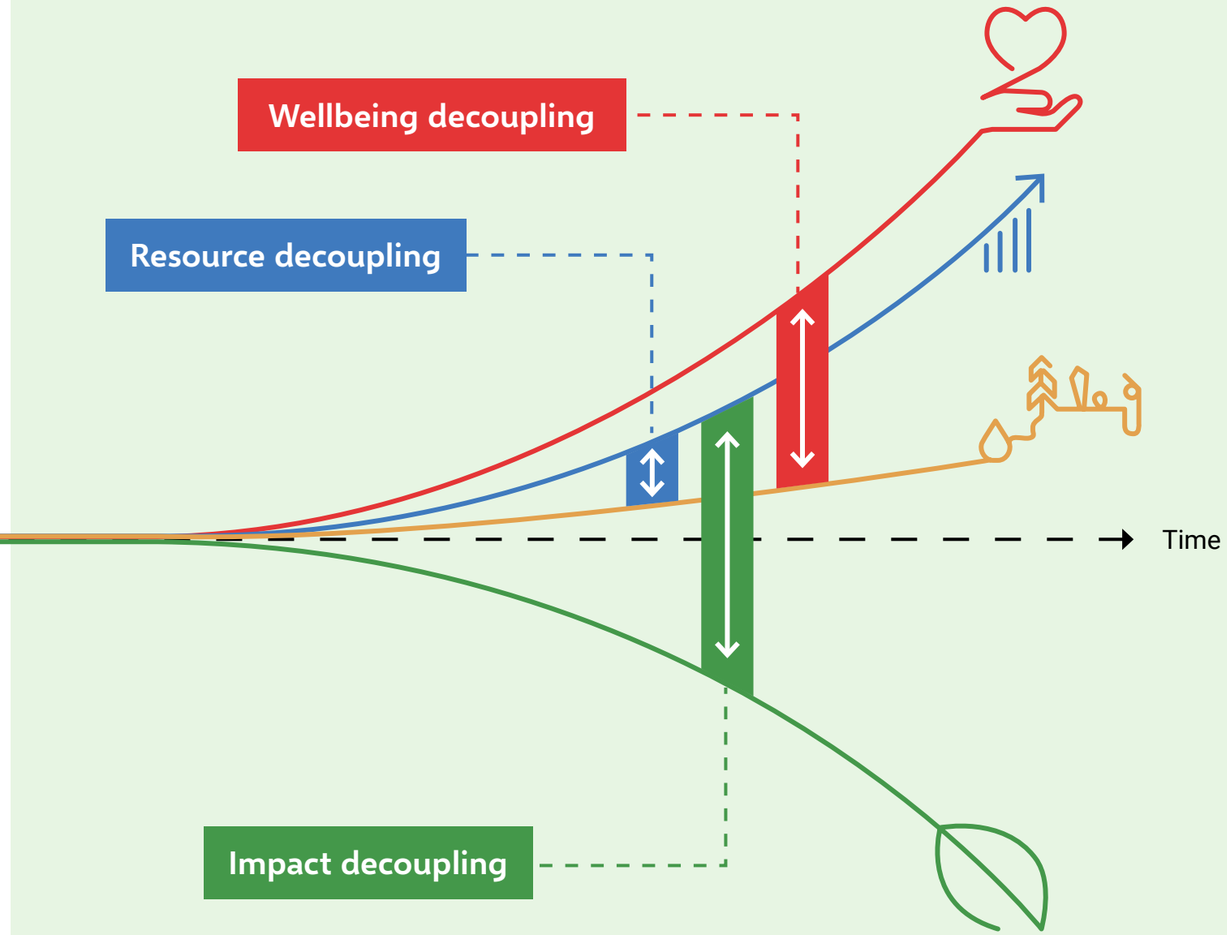


Figure 2 **Decoupling concept (IRP, 2021)**

The science is clear: decarbonization and dematerialization are urgently needed in tandem—they are two sides of the same coin

Focusing only on supply-side efforts—on providing renewable energy and greening existing production sectors—is insufficient to achieve agreed climate and sustainability targets.

Major climate and energy models confirm that absolute reductions in the use of energy and natural resources can deliver significant greenhouse gas (GHG) emission reductions and are crucial to meet the Paris Agreement target of limiting global warming to 1.5°C. To realize these reductions effectively, supply-side measures (i.e., measures that seek to make current production systems more efficient) must be coupled with demand-side measures (i.e., measures that seek to reduce resource use and overall production and consumption).

This was clearly recognized by a recent report by the Intergovernmental Panel on Climate Change (IPCC, 2022). The IPCC finds that strategies that deliver absolute resource demand reduction (e.g., those that avoid, reduce and improve production and consumption) and new models of service provision could reduce global GHG emissions from buildings, transport, food, industry and energy supply systems by 40-70 percent by 2050, while still being consistent with delivering basic wellbeing for all.

Moreover, models investigating other planetary boundaries (e.g., biodiversity loss and pollution) also confirm that resource use must decrease dramatically to achieve climate and other SDG-related targets. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services states that less resource-intensive production and consumption patterns would make a significant contribution toward achieving sustainability targets, such as preventing climate change, conserving biodiversity and controlling air pollution (IPBES, 2019).

Although the scientific modeling is clear, achieving an absolute reduction in natural resource use is a blind spot in current climate and sustainability strategies. Most countries still neglect circular economy and resource efficiency solutions that address both supply and demand in their climate policies, nationally determined contributions (NDCs) and national biodiversity plans.

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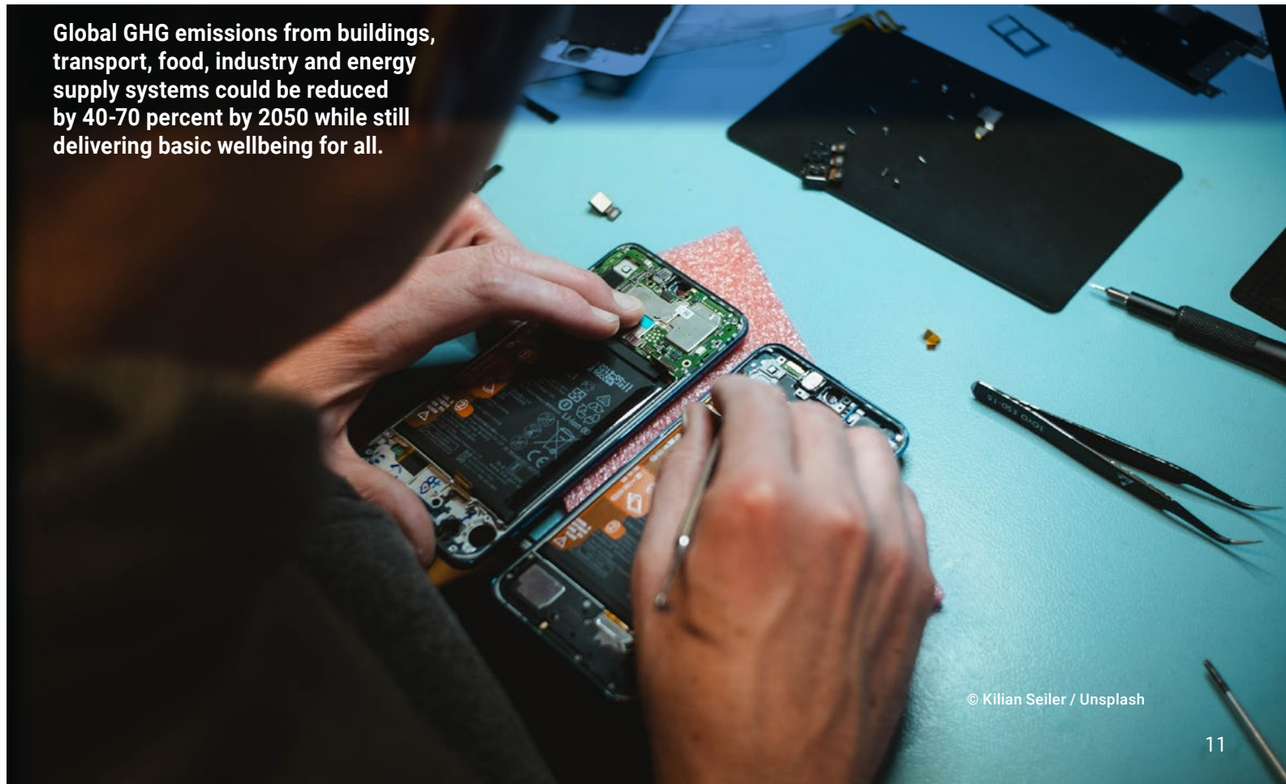
Global GHG emissions from buildings, transport, food, industry and energy supply systems could be reduced by 40-70 percent by 2050 while still delivering basic wellbeing for all.

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Resource efficiency can help deliver climate mitigation with benefits for nature, people and industry, as long as potential side effects are well managed

Demand-side measures are essential to address issues relating to responsibility and equity. Resource efficiency, particularly in high-income countries, should thus be complemented by sufficiency-based policies. We must stop ignoring the inherent wastefulness of current production and consumption systems. For example, it is futile to decarbonize the production of steel if this is then used to produce under-utilized cars and houses, which contribute to traffic and property market bubbles, but not to real social prosperity.

Four dimensions underpin the resource efficiency strategies needed to decouple resource use from economic growth and environmental impacts, while still improving wellbeing. All dimensions individually and collectively aim to reduce resource consumption—either absolutely or relatively, depending on a country's circumstances—while maintaining the primary function or wellbeing benefit delivered by a given resource, making this framework universally applicable.

The four dimensions of resource efficiency are as follows:

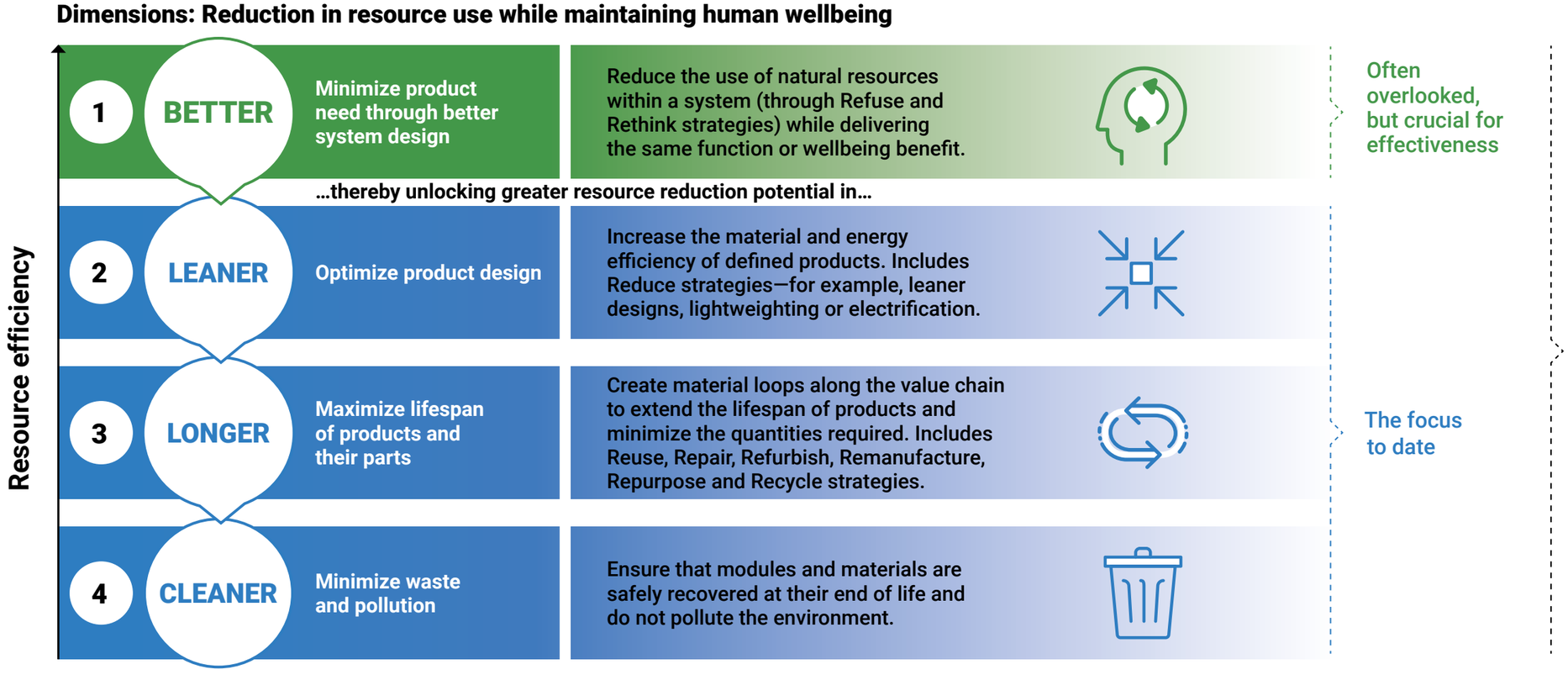

Figure 3 Framework for the holistic application of resource efficiency[5]

Source: Developed for this paper by SYSTEMIQ in consultation with IRP Co-Chairs

Together, these four dimensions ensure resource efficiency is applied systematically, beyond its traditionally narrow definition, which encompasses only supply-side measures. This broader understanding of resource efficiency can, for example, be achieved through circular economy approaches if these are also applied in a broad, comprehensive and holistic way.

5 While each dimension is useful and necessary, it is important to note that their impact could be limited due to so-called "rebound effects," where the expected gains from measures that improve the efficiency of resource use are canceled out by changes in people's behavior. This must be carefully assessed, managed and regulated.

Strategies that reduce the use of natural resources by improving the way systems are designed to deliver value are currently being neglected, missing major opportunities for resource reduction

The focus to date has been on realizing the "Leaner," "Longer," "Cleaner" dimensions of resource efficiency by improving the supply side of production and consumption systems—for example, through strategies for lightweighting or recycling—rather than addressing the demand side by considering how the total amount of natural resources needed to deliver a certain function can be reduced. This is a clear missed opportunity, as in many cases "Better"— reducing the use of natural resources by improving how production and consumption systems are designed to deliver value—has the greatest potential for larger-scale impacts, including on climate mitigation.

Analysis by IRP reveals that better utilization (i.e., reducing excessive floor space through smarter urban planning and building design) would result in the highest emissions reductions in the built environment in G7 countries. Similarly, better utilization of vehicles through car sharing and ride sharing was the most promising strategy for increasing the material efficiency and lifecycle emissions of cars (IRP, 2020).

For example, applying resource efficiency to the automotive sector may produce leaner and more efficient vehicles, but it would miss opportunities linked to new ownership models that increase vehicle utilization, a shift to other transport modes or reduced need for travel in the first place through more compact city design or increased working from home. Significant potential for absolute resource reduction would thus be overlooked.

One major reason why such strategies are often neglected is that they require deep shifts across the economy and industry sectors, and radical innovation in business models. By optimizing products and traditional production sectors in isolation—which many economic policies do—we miss opportunities for deeper system innovation. We need to fundamentally redefine what we are optimizing for. We need to shift away from maximizing production output to delivering provisioning systems that meet human needs. This is an essential part of resource efficiency implementation leading to material footprint reduction.

To implement all four dimensions of resource efficiency, policymakers should optimize the most resource-intensive provisioning systems to meet societal needs with minimal resource input.

This requires a rethink of the systems that meet our needs to make low-resource—and even no-resource—alternatives easy and attractive options. This starts by rethinking the current economic system and its drivers to correct the incentives for consumers and producers, which currently encourage unsustainable and ever-increasing resource use. Among the four most resource-intensive provisioning systems are nutrition; the built environment; mobility; and fulfillment of daily functional needs.[6]

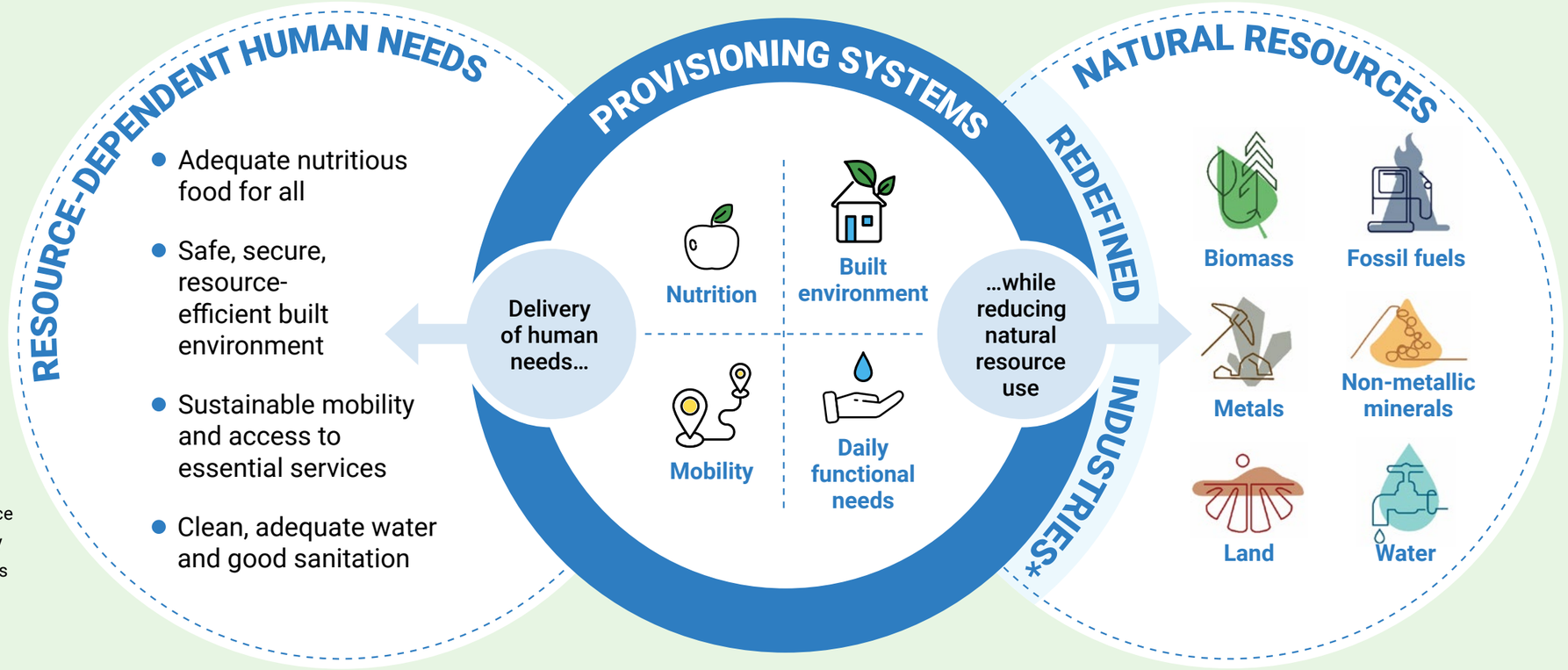

Figure 4
Provisioning systems aim to deliver resource-dependent human needs while minimizing resource use

* Redefined industries service the provisioning systems by delivering wellbeing benefits with circular resources (e.g., energy, digitalization)

Source: Developed for this paper by SYSTEMIQ in consultation with IRP Co-Chairs

6 As defined in the *System Change Compass* report by SYSTEMIQ and The Club of Rome (SYSTEMIQ and The Club of Rome, 2020)

Redesigning systems for resource efficiency is by no means simple, but it can unlock greater multiple benefits

Building on the recognition that resource production and consumption are at the heart of the triple planetary crisis, and that their reduction is key to achieving climate and sustainability targets, policymakers must now work to deliver real action.

Accelerating resource efficiency and—crucially—applying it across **all four dimensions** fundamentally requires us to reassess our values, rethink our economies and reduce overconsumption and resource use while still delivering on wellbeing outcomes.

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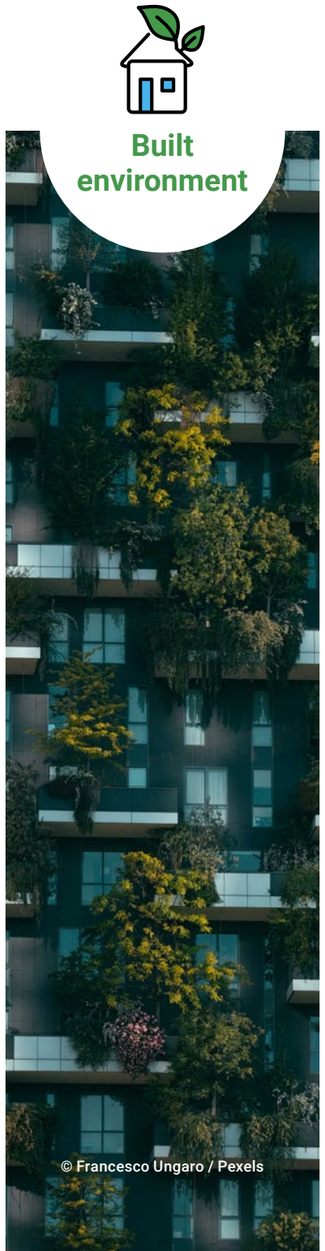

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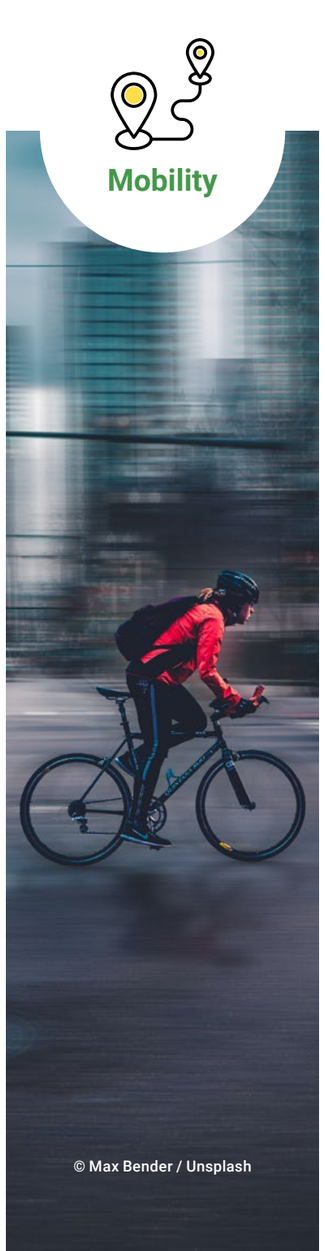

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IMPLEMENTING THE FOLLOWING STEPS WITH IMMEDIATE EFFECT IS ESSENTIAL TO BEGIN TO MAKE THIS A REALITY

1 **Redefine value:** Rethinking how value is defined and how economic success is measured can ensure that resources are used to deliver genuine human needs. Introducing natural capital into national accounting systems is one critical step in this regard. To this end, governments could make inclusive wealth[7] an accepted measure of progress. The concept of inclusive wealth accounts for the benefits from investing in natural assets and highlights the tradeoffs and interactions between investments in different assets. This would unlock major opportunities for the environment, the economy and human health.

2 **Rethink our perspective:** Taking a **provisioning systems perspective**, as opposed to looking at individual sectors, would enable policymakers to act in accordance with these inclusive wealth measures and optimize for these values. Optimizing individual sectors for production is no longer the most useful approach; instead, we need to optimize provisioning systems to meet societal needs with minimal resource input.

3 **Define the North Star:** Countries should set clear ambitions to promote resource efficiency across **all four dimensions** by **setting resource reduction-related targets and integrating them into climate and other sustainability strategies.** Policymakers should therefore complement the energy and GHG-related targets set out in NDCs with new resource reduction-related targets. Ultimately, this requires climate commitments to spell out the specific implications for resource consumption.

4 **Foster global collaboration:** Global collaboration for resource efficiency must be founded on principles of equity and inclusion. By definition, transforming sectors and systems to deliver wellbeing equitably and with significantly fewer resources requires cross-border cooperation in today's globalized world. A first step toward achieving this would be through **detailed scientific monitoring and reporting of transborder resource flows and their social and environmental impacts.** The resulting coherent and transparent global resource use data could then form the bedrock for further collaboration efforts.

5 **Support implementation:** To realize their resource reduction ambitions, policymakers should ensure governments, businesses and consumers are incentivized through regulatory and fiscal policies that support the application of all four dimensions of resource efficiency. Policymakers should define and monitor metrics, work closely with industry and communities to support new business models, and ultimately invest and remove perverse fiscal incentives which drive uncontrolled resource (over)consumption.

7 A country's "inclusive wealth" is the social value (not dollar price) of all its capital assets, including natural capital, human capital and produced capital (UNEP, 2018).

Countries should seize the opportunity offered by the four dimensions of resource efficiency to initiate the transformations needed to deliver climate targets as well as biodiversity and pollution benefits

The transition to sustainable—and ultimately reduced—natural resource use is an economic, security and resilience imperative. To achieve climate and biodiversity targets and sustainability ambitions while staying within planetary boundaries, the goal must be to use fewer natural resources while increasing societal wellbeing. A targeted approach and policies around all four dimensions of resource efficiency are indispensable to address the challenges we face.

We live in a world that champions consumerism and economic growth at an unacceptable environmental and social cost. The problem is that thus far, humankind has not separated economic growth from ever-increasing demand for resources. This is not an easy transition to make, but it is certainly possible. Examples exist of well-functioning cities with high quality-of-life scores. These provide high levels of active mobility; compact yet balanced neighborhoods; and easy access to locally produced, healthy and plant-based food. In other words, they deliver high living standards through shifts in mobility, the built environment and nutrition—the shifts we need to reduce resource use at scale.

We should harness the abundant potential presented by demand and supply-side resource management solutions to address the triple planetary crisis of climate change, biodiversity loss and pollution. Policies that strive to create the fundamentally more resilient economy of tomorrow can create opportunities for business innovation as well as societal and public entrepreneurship.

Applying resource efficiency holistically implies a fundamental redesign of resource-intensive systems. This requires innovation across policies, sectors and products to facilitate a shift in value creation. For example, we can shift from traditional mass production industries to new distributed manufacturing models and dematerialized service business models. We need to reject the assumption that the systems that provide us with food, shelter, mobility and daily functional needs must necessarily be so resource intensive.

Current resource patterns still reflect the shadows of an imperialist world, in which wealthy nations pursue their ambitions at the expense of others. A more stable and sustainably prosperous future demands a transition to an era of responsible resource use, in which benefits are more fairly shared, mitigating resource-related security risks and strengthening our collective preparedness and resilience. This would make the UN SDGs implementable in practice and keep them meaningful.

High-income countries must demonstrate to the world that they are willing and able to change the reality they have created, and to lead the essential transition of our value and use of natural resources—both domestically and globally. But this does not preclude all other countries from active participation in delivering the future we want. While responsibility for the past clearly rests more with high-income countries, responsibility for the future is shared and belongs to us all.

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“Current resource patterns still reflect the shadows of an imperialist world, in which wealthy nations pursue their ambitions at the expense of others. A more stable and sustainably prosperous future demands a transition to an era of responsible resource use, in which benefits are more fairly shared”

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