

Circular Economy Act

An Opportunity to Mend our Garden

JANEZ POTOČNIK

Co-Chair International Resource Panel - IRP

Member Club of Rome

Partner Systemiq

Co-founder Systems Transformation Hub

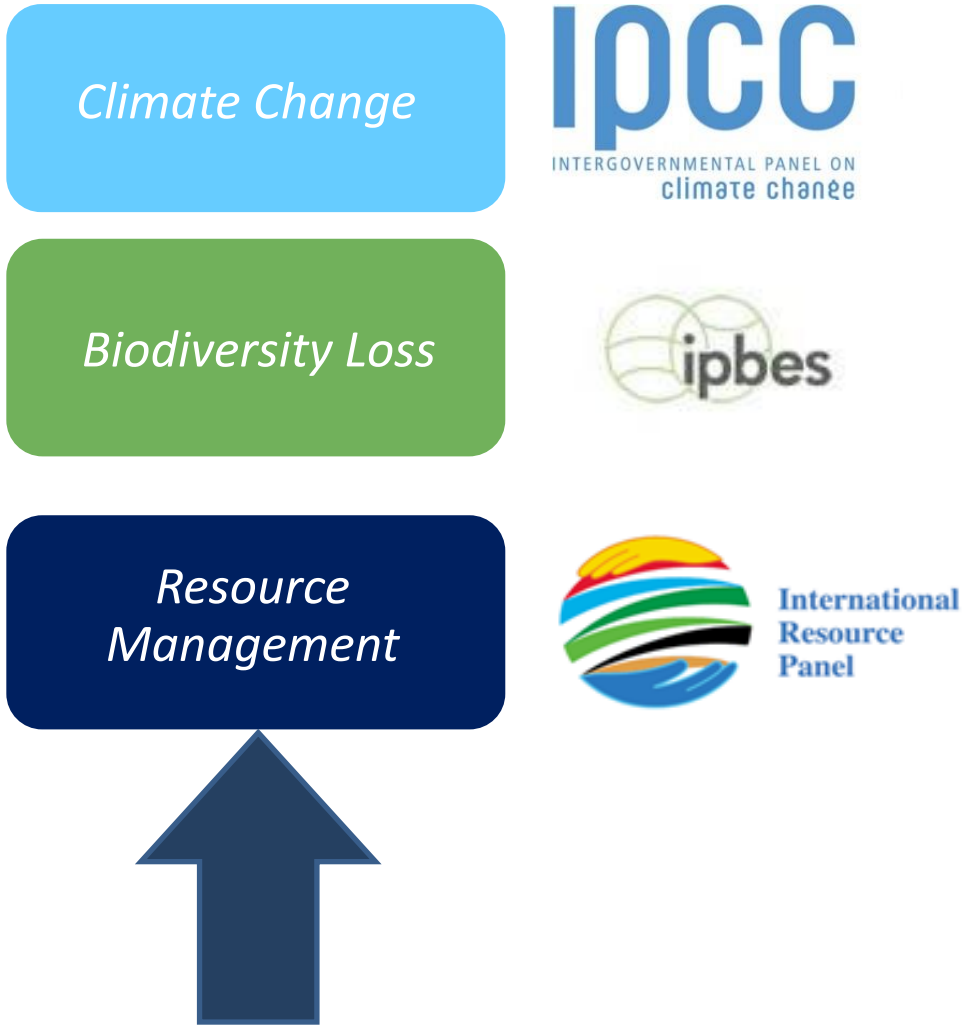
Brussels, 01. July 2026

Who are we?

International Resource Panel - IRP was launched in 2007 as a science-policy interface on the sustainable use of natural resources and in particular their environmental impacts over the full life cycle.

IRP is hosted by UNEP and providing science in a wider UNEP framework.

UN environment programme



International Resource Panel

Panel Co-Chairs:
Janez Potočnik and Izabella Teixeira

Steering Committee Co-Chairs:
Astrid Schomaker and Steven Stone

SCIENTIFIC PANEL

Internationally recognized experts on sustainable resource management;

Scientific assessments and advice, networks

Science-Policy interface

Head of Secretariat: *Merlyn van Voore*

UNE SECRETARIAT

Direction, procedures, support in development and implementation of assessments, outreach

STEERING COMMITTEE

Governments from developing and industrialized countries;

Strategic guidance, political support, regional synergies

Strategic Partners

One planet handle with care

World Business Council for Sustainable Development

UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

International Science Council

SCIENCE POLICY BUSINESS FORUM

WORLD RESOURCES INSTITUTE

WORLD ECONOMIC FORUM

WORLD RESOURCES FORUM

PBL Netherlands Environmental Assessment Agency

SUN

UNITED NATIONS ECLAC

ELLEN MACARTHUR FOUNDATION

EARTH COMMISSION

OECD

International Science Council

ICC

YEE YOUTH AND ENVIRONMENT EUROPE

PACE
PLATFORM FOR ACCELERATING THE CIRCULAR ECONOMY

IUCN

Quo-Vadis Humanity?

The diagnosis and the context of the problem

We are living in strange times …



Source: Wikipedia

German philosopher Georg Hegel was right:

"The only thing we can learn from the history, is that we learn nothing from history."

We are living in strange times …



Slavoj Žižek:

“It is clear that we are approaching the ecological and digital apocalypse … but we should not loose nerves.”

“Everything under Heaven is in utter chaos; the situation is excellent.”

“It is easier to imagine the end of the world than the end of capitalism.”



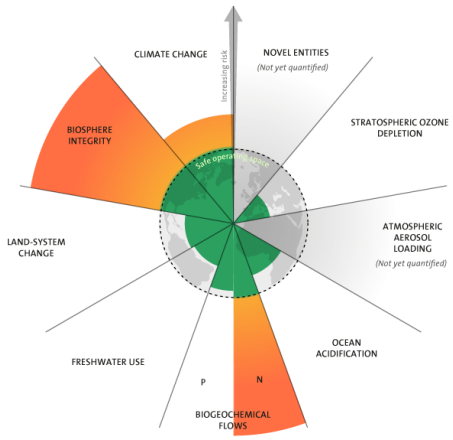
For the first time in a human history, we face the emergence of a single, tightly coupled human social-ecological system of planetary scope.

We are more interconnected and interdependent than ever.

Our individual and collective responsibility has enormously increased.

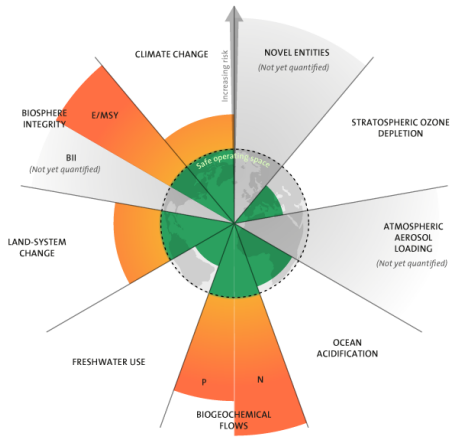
Planetary crises is making instability the norm

2009



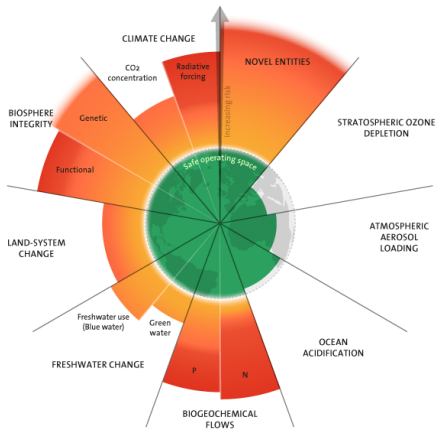
7 boundaries assessed,
3 crossed

2015



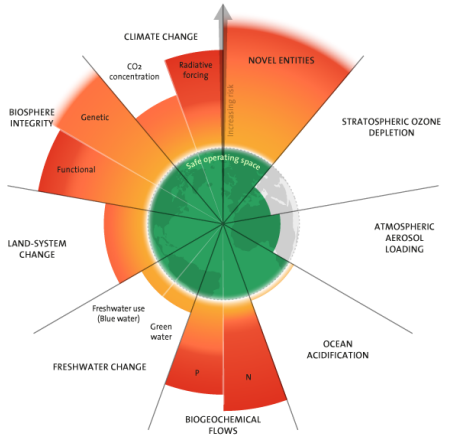
7 boundaries assessed,
4 crossed

2023



9 boundaries assessed,
6 crossed

2025



9 boundaries assessed,
7 crossed

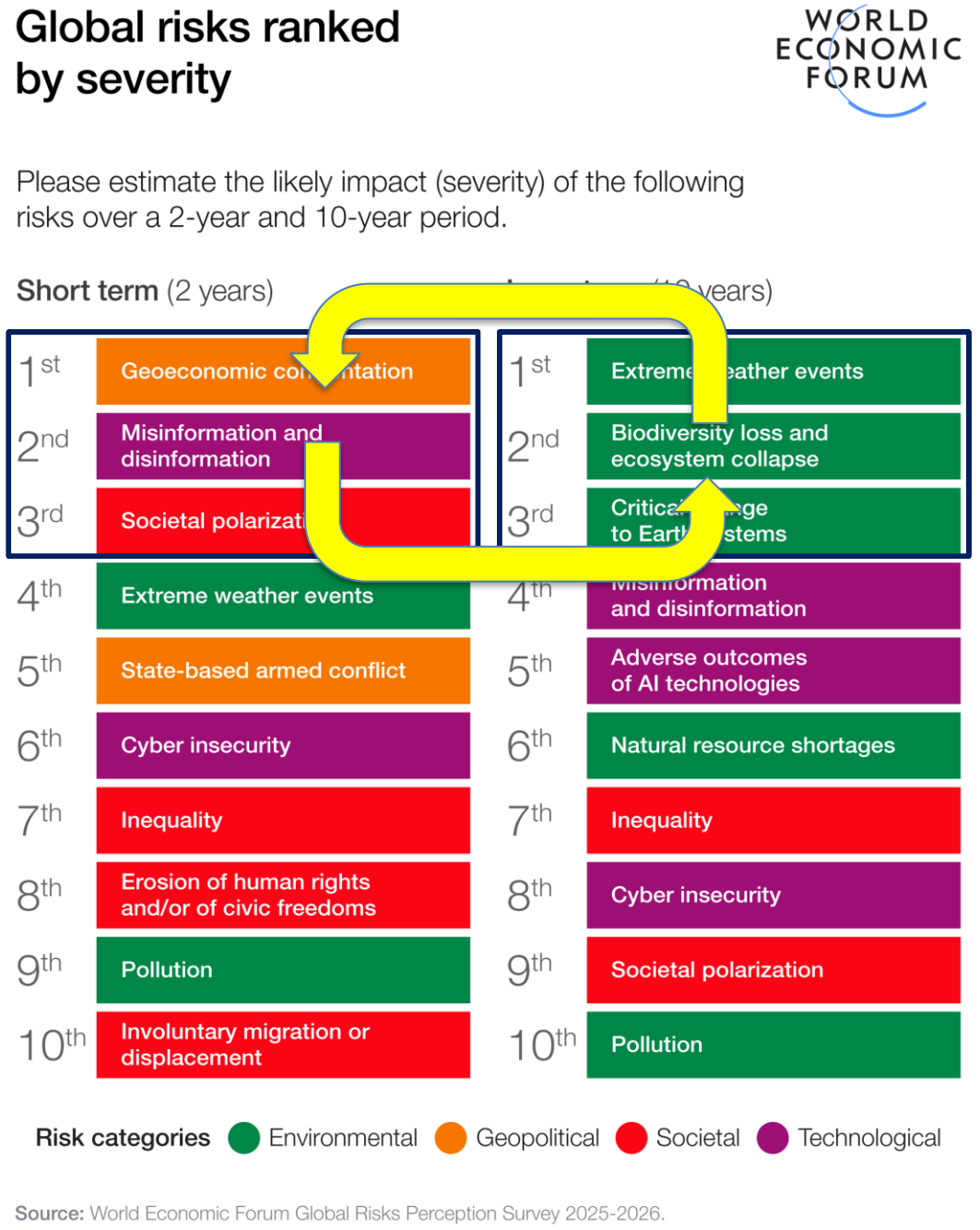
Source: Azote for Stockholm Resilience Centre, based on analysis Sakschewski and Caesar et al. 2025, Richardson et al. 2023, Steffen et al. 2015, and Rockström et al. 2009

Problem identification

Long term risks are understood well by business community.

Short term risks do very much differ from long term risks.

Political/policy priorities are designed according to short term needs which leads to the lack of policy consistency and absence of clear strategic direction. We must align short term policy better to a long-term needs!



GRO 2024: Bend the Trend

Drivers, pressures, and natural resource use trends

Natural Resources

Access to and use of natural resources have been in the human history closely related to the level of the achieved wellbeing of the nations, but also to stability, security, conflicts, wars (Access to Land, Water, Oil and Gas, Minerals, Precious Metals …)

It was driving the geo-political efforts of consumption countries to control the resource rich countries.

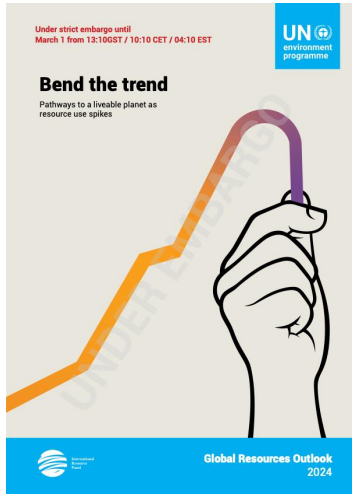
The whole history of the colonialisation of nature, is also central to fairness and equity.

Economy Championed by Industrialised Nations is Wasteful and Unjust

We must shift away from the prevailing resource wasteful economic approach towards an economy that is efficiently meeting human needs and optimise human wellbeing. The current logic is both ethically and ecologically unsustainable.

We must set the order right. Economy was invented to serve humans and our needs, and not the opposite.

Definition: Materials and Resources





***Biomass**: crops for food, energy and bio- based materials, wood for energy and industrial uses*



***Fossil fuels**: covering coal, gas and oil, among other*



***Metals**: such as iron, aluminum and cooper, among other*



***Non-metallic minerals:** sand, gravel, limestone and minerals used for industrial applications*



Land



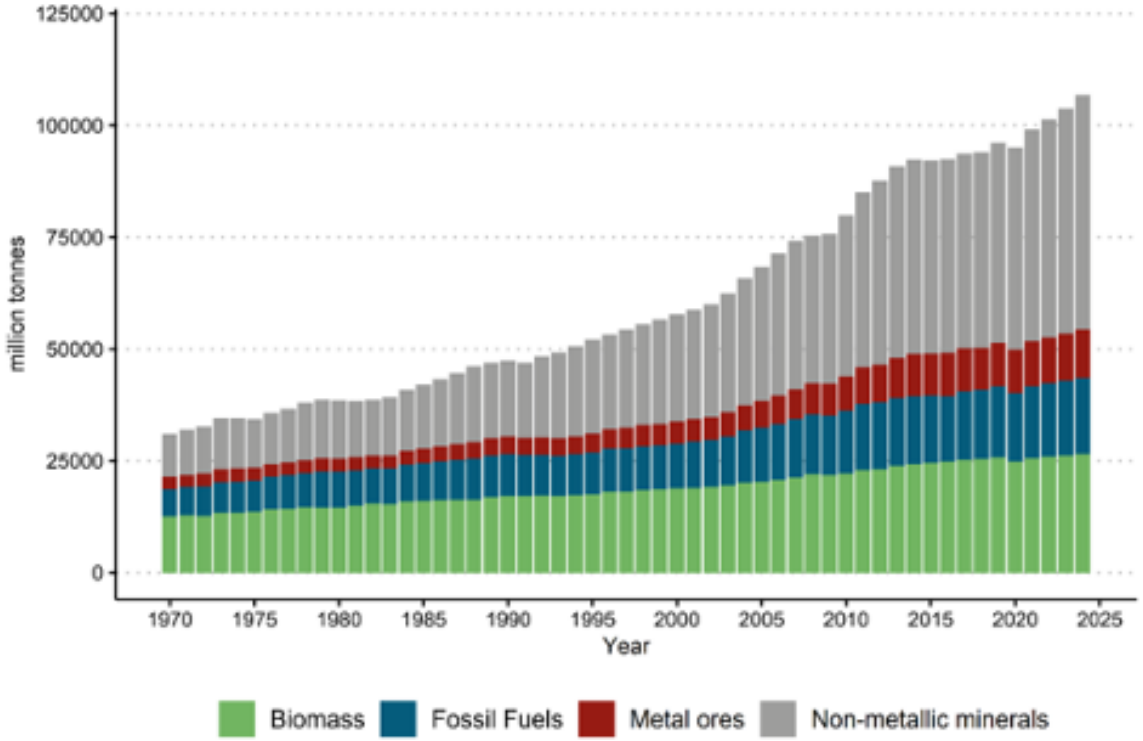
Water

Materials:
Everything extracted from the Earth

Resources:
Materials + Land and Water

Trends: Global Material Use and Share in 1970-2023

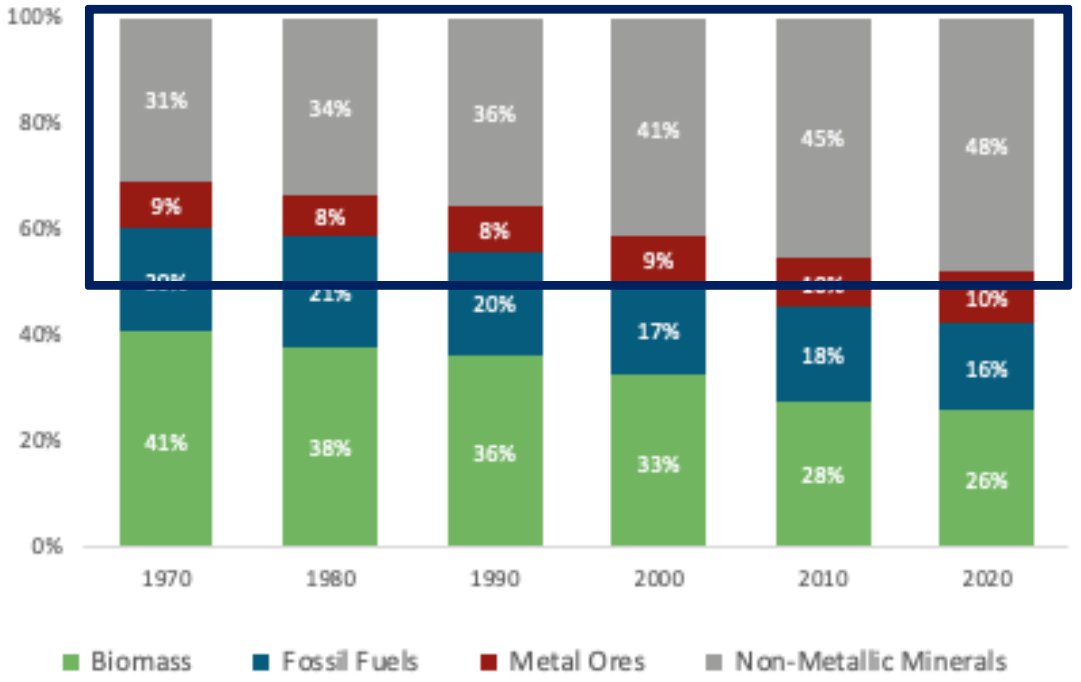
Global Material Use has increased for more than a factor of 3 since 1970 due to urbanisation and industrialisation (and population growth) - 2.3% per year



Global material extraction, four main material categories, 1970 – 2024, million tones.

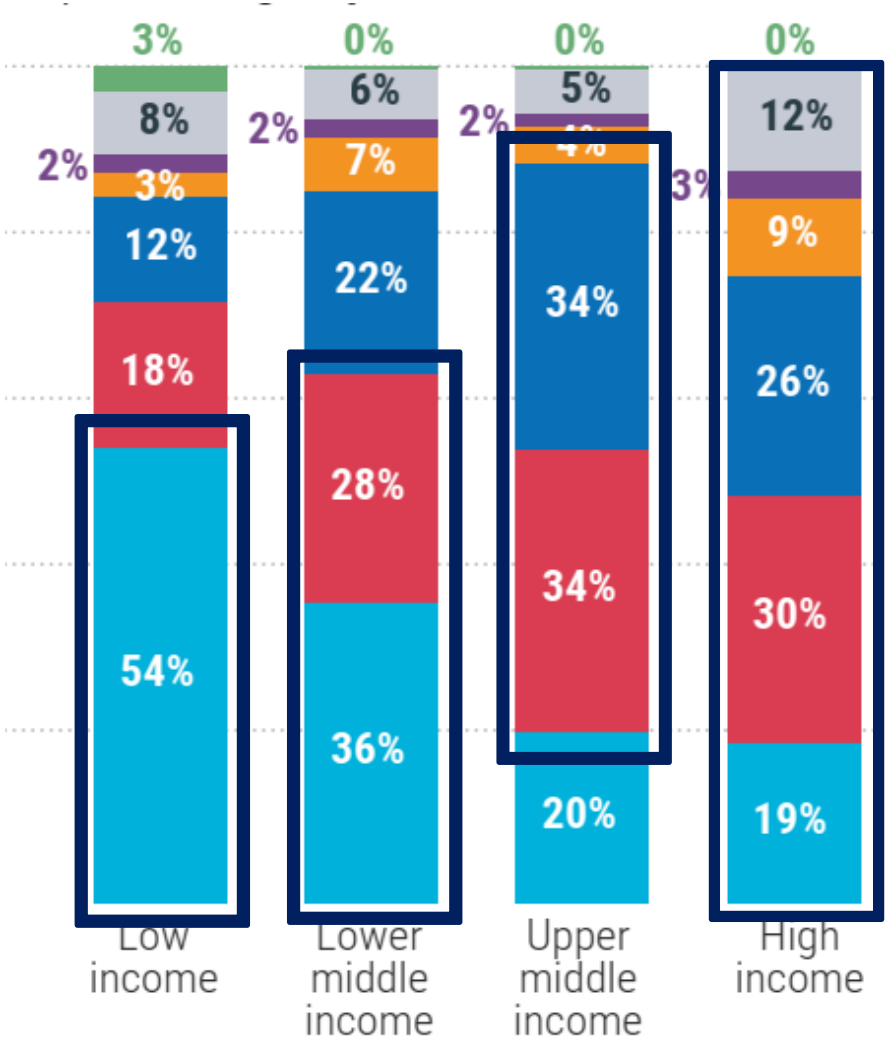
… which is increasing also the share of Non-Metallic Minerals in Global Material Use

(Main Asia-Pacific Region Impact)



Global material extraction, four main material categories, 1970-2020, shares

Trends: The material needs for provisioning systems (built environment, mobility, energy and food) by country income groups (2020)



Food
Mobility
Built environment
Energy
Communication
Other
Waste Management and Resource Recovery

Energy includes household energy consumption
All other provisioning systems include their embodied energy

Built environment and mobility: *(construction, transport sector&infrastructure): 59 billion tonnes*

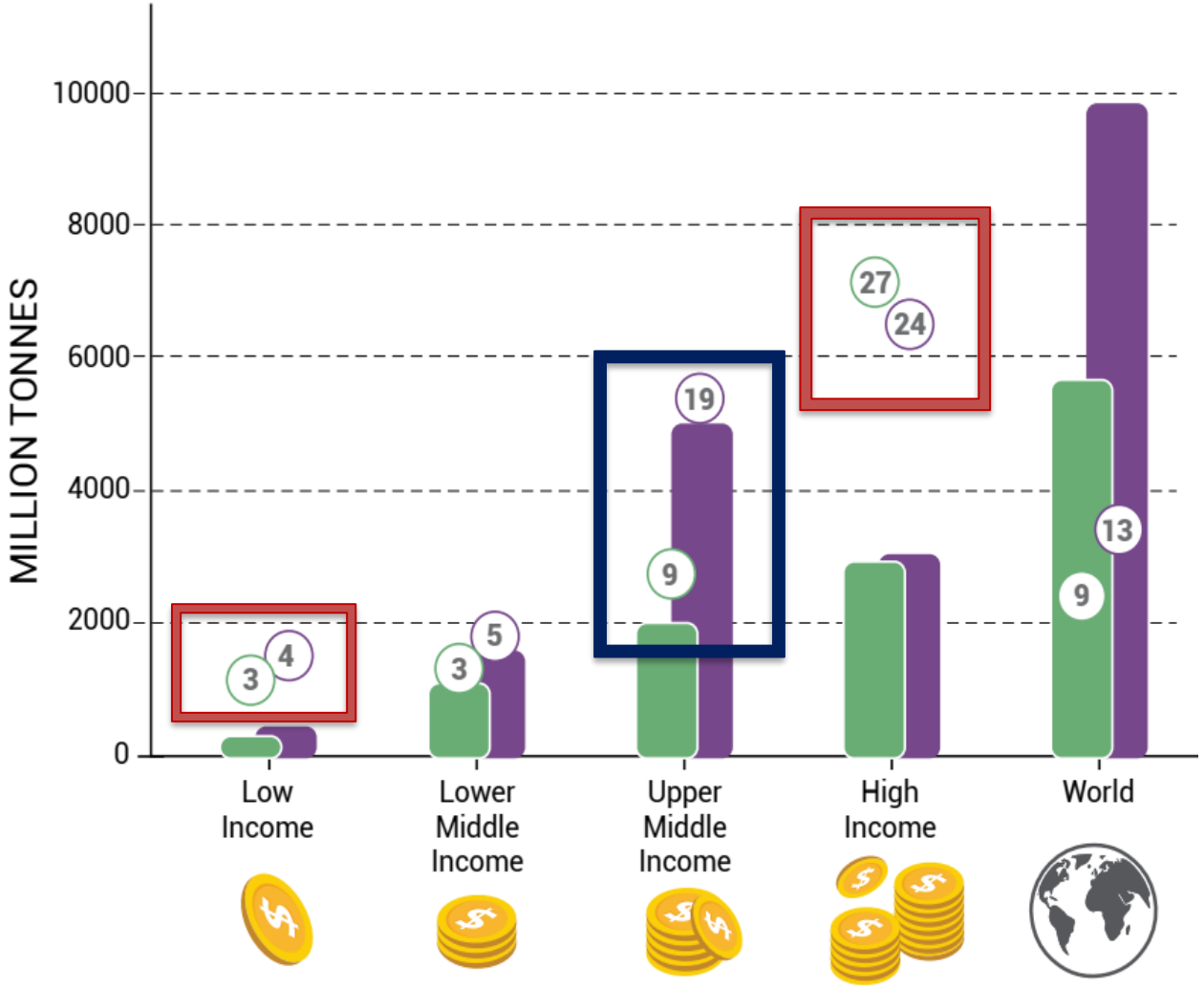
Food*: 23.6 billion tonnes*

Energy: *(electricity, power, heat): 6.1 billion tonnes*

Together = 90% of total global material demand, but differ in importance by income group

Source: Global Material Flows Database (UNEP 2023a)

Trends: High-income countries use six times more materials per capita and are responsible for ten times more climate impacts per capita than low-income countries.

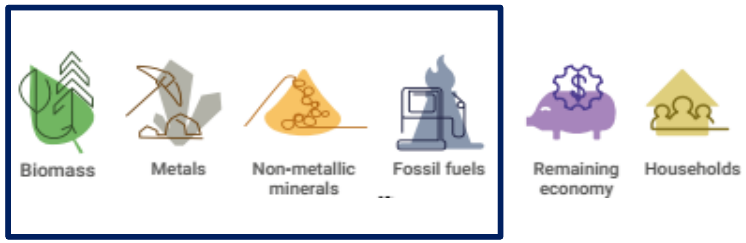


From 2000 … to 2020

- *High-income: Highest material footprint of all groups, relatively constant. Climate impact per capita = 10 x low-income group.*
- *Middle-income: material footprint more than doubled, approaching high-income levels. Climate impact per capita = roughly 50% of high-income group; 6 x low-income group.*
- *Low-income: Remain comparatively low, and mostly unchanged.*

Impacts: Extraction and Processing of Natural Resources Drives all Aspects of the Triple Planetary Crisis

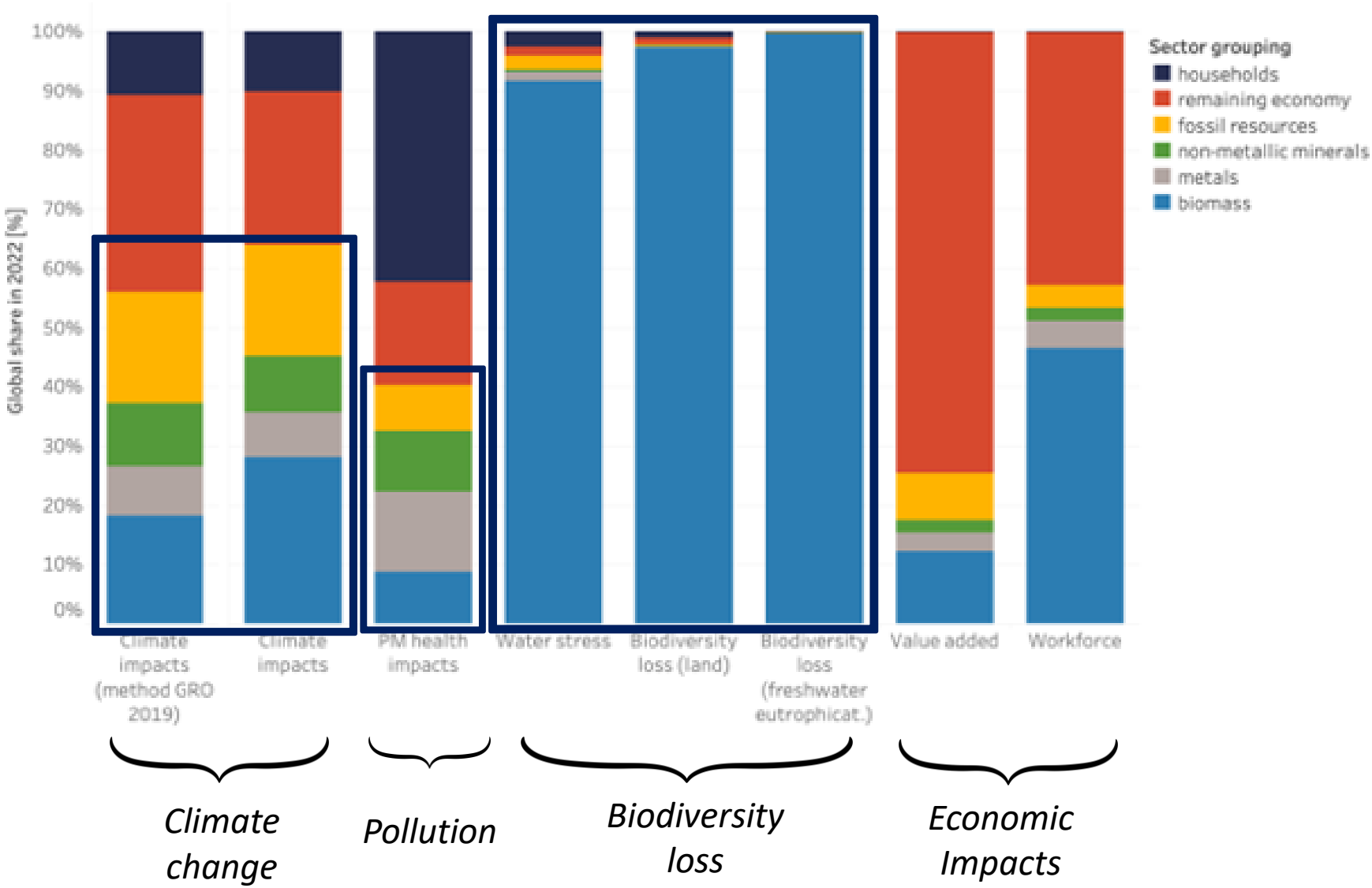
Environmental impacts of materials in the value chain in extraction and processing phase



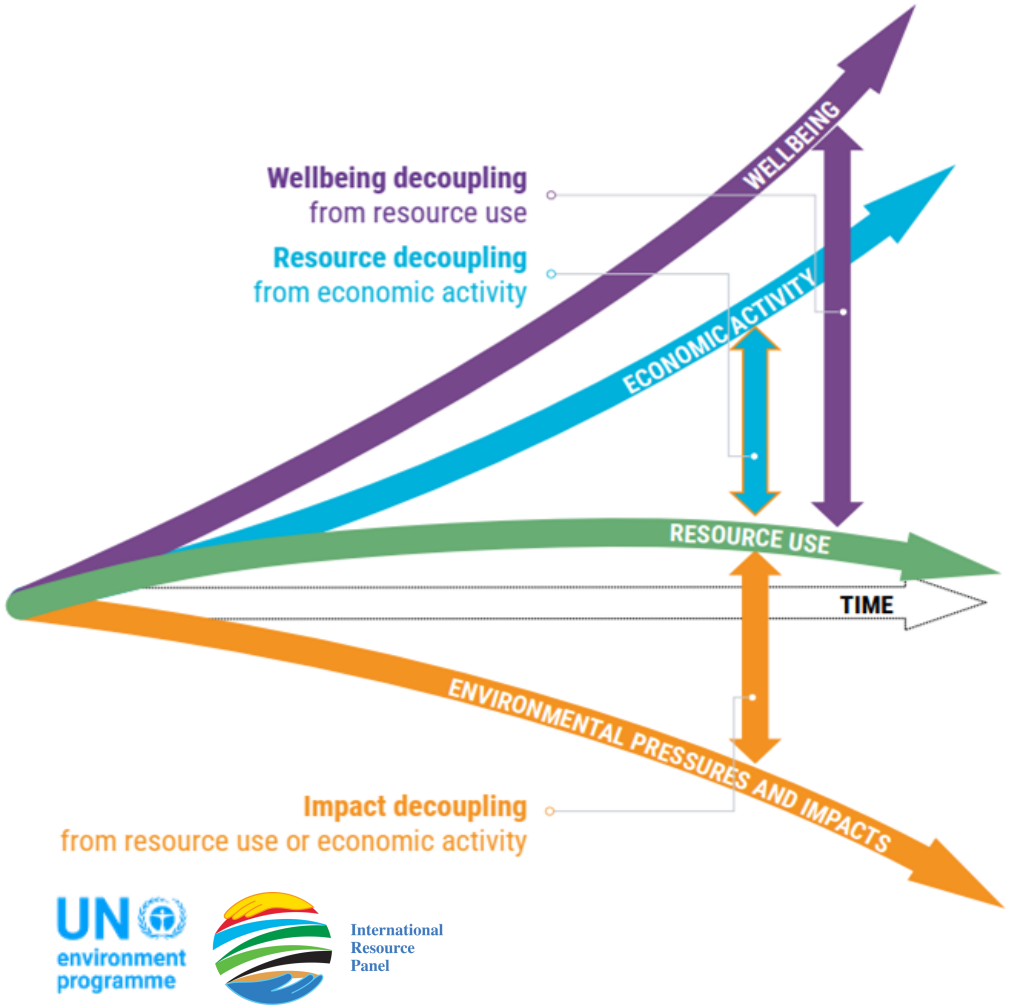
60% of global climate change impacts including land use change

40% of air pollution health impacts

More than 90% of water stress and global land and water eutrophication related biodiversity loss



Solutions: Decoupling resource use from economic activity and human wellbeing & targeting it to human needs through provisioning systems



Natural resources

- Biomass
- Fossil fuels
- Metals ores
- Non-metallic minerals
- Land
- Water

Provisioning systems

- Nutrition
- Built environment
- Mobility
- Energy

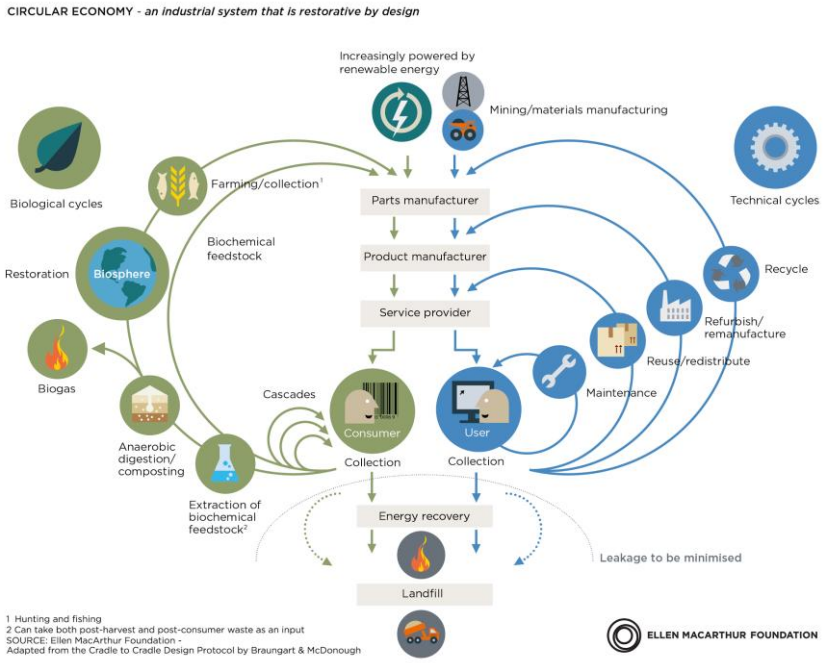
Human needs

- *Adequate, nutritious food for all*
- *Safe, secure, resource-efficient built environment*
- *Sustainable mobility and access to essential services*
- *Access to clean, safe energy*

Source: International Resource Panel (2024), Global Resources Outlook 2024 (https://www.resourcepanel.org/reports/global-resources-outlook-2024)

Why Circular Economy?

The logic of the logical …



Circular (bio)economy should be seen as an instrument for delivering decoupling, as well as a part of the bigger picture of economic, societal and cultural transformation needed to deliver the SDGs and other international agreements.

Circular Economy is just using common sense

Circular bio-economy is the oldest concept on planet Earth. All nature is based on the principles of a circular economy: nothing is lost, and everything has its purpose. We humans, as part of nature, should abide by the same principles. Unfortunately, what seems logical in theory isn't so clear in practice.



From fossil to metals/minerals economy

Materials: *Everything extracted from the Earth*

Biomass: *crops for food, energy and bio- based materials, wood for energy and industrial uses*

Fossil fuels: *covering coal, gas and oil, among other*

Metals: *such as iron, aluminum and cooper, among other*

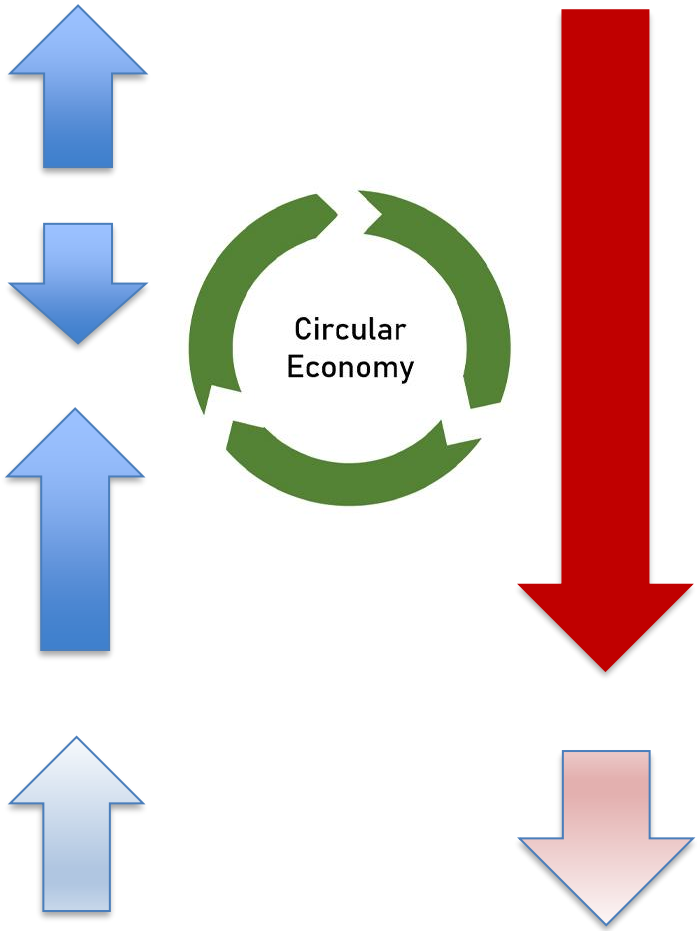
Non-metallic minerals: *sand, gravel, limestone and minerals used for industrial applications*

Land

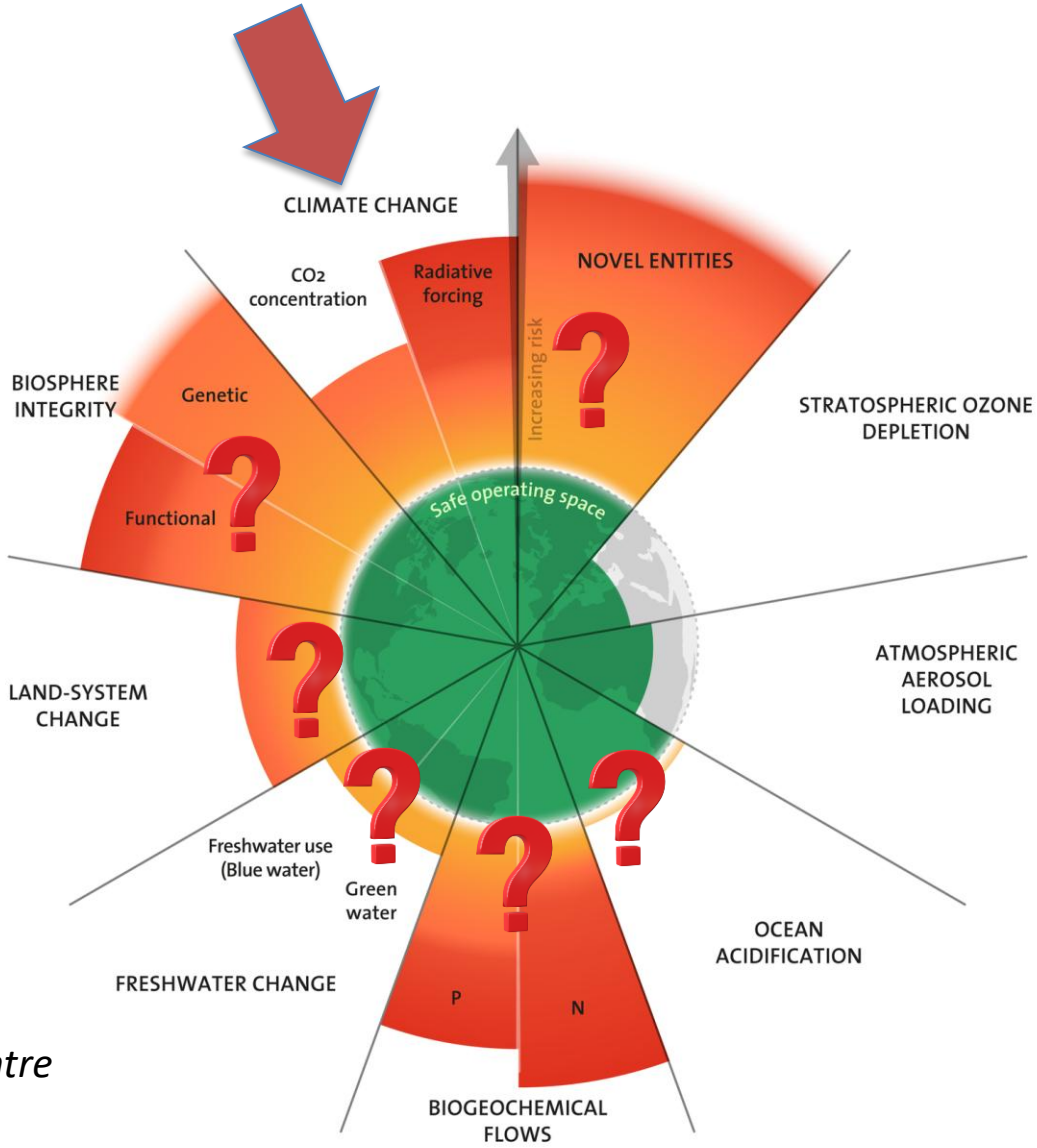
Water

Metals/Minerals Economy

Fixing the baseline



Energy transition is critical, but for living within Safe Operating Space we must make all economic systems sustainable



Source: Stockholm Resilience centre



Source: Medium, Vecteezy,

From Product Maximisation to Providing Human Needs

It is not not about owing it is about using

We do not need cars	*…*	*We need mobility*
We do not need light bulbs	*…*	*We need light*
We do not need chairs	*…*	*We need to sit*
We do not need refrigerators	*…*	*We need chilled and healthy food*
We do not need CDs	*…*	*We want to listen to the music*
We do not need pesticides	*…*	*We want healthy plants*



Dematerialisation, Rethinking Ownership, Efficiency should be Complemented with Sufficiency

Main question often-overlooked to be addressed

How to meet human needs in most energy and resource efficient way?



https://edistaffing.com



Source: Mint

Importance of the Point of Perception

When you complain that you are caught in a traffic jam …

you are wrong.

You are traffic jam.

Quo-Vadis Europe?

Structural Challenge

Security, Resilience and Prosperity

If we want to avoid extinction of elephants in nature …

we must extinct elephants in our rooms



Source: Hop distance - The elephant in the room ...blogs.bmj.com

Main Blind-Spots preventing us to move faster and deeper

Lack of Holistic System approach

Public leaders and others lack capacity or knowledge of how to translate system change visions into their concrete policies/investment structures which ends in conflicting policy logics that hinder real transformation

Lack of Drivers and Pressures Perspective

Policy attention does not focus on the roots of the problem and address the drivers and pressures. It lack focus on natural resource use and management, as well as on market signals leading consumers and producers' behaviour.

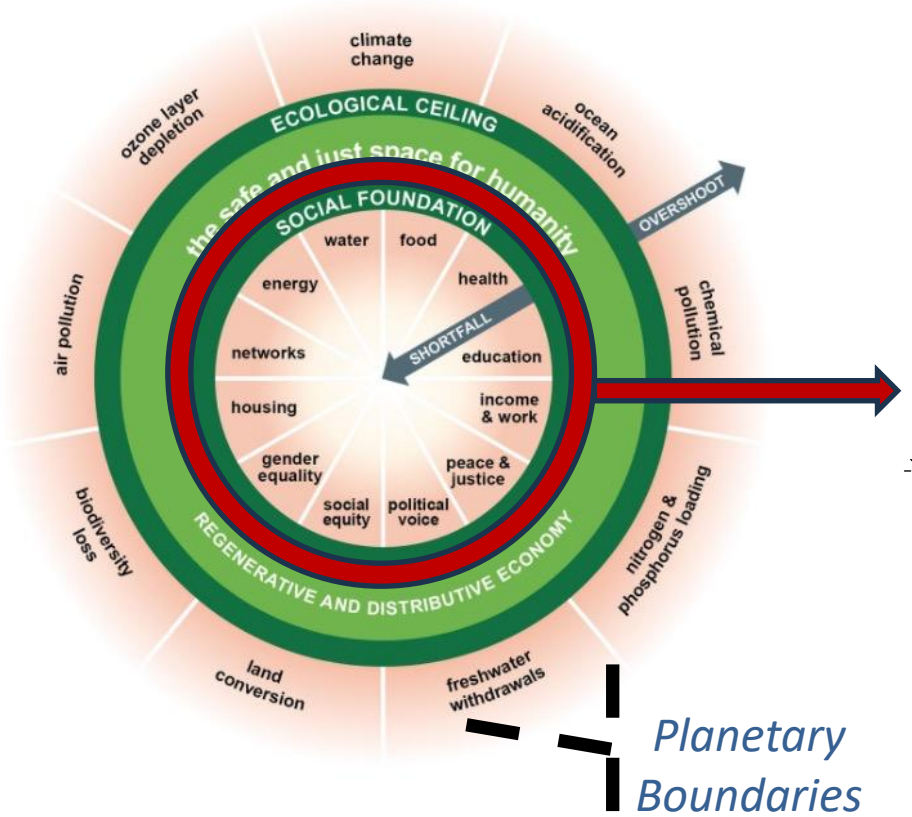
Lack of Demand Side Focus

Policy attention is mainly given to the supply side of the economy, to the cleaning of the existing economic system - lacking the attention to the demand side which is leaving out an important solutions potential and questions of responsibility and equity.

We must embrace Systemic Path to Wellbeing

What?

Meeting Human Needs
Respecting Planetary Boundaries



Planetary Boundaries

Source: Raworth 2017

Policy Focus

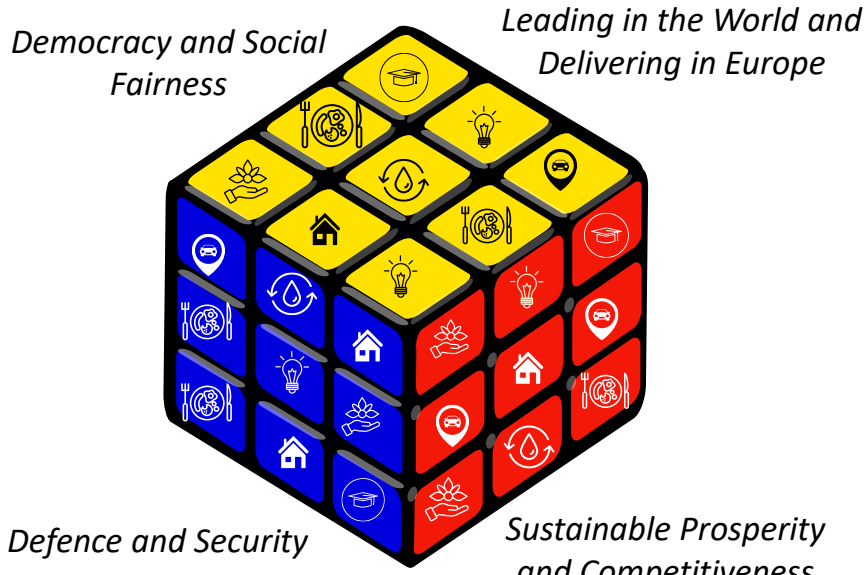
Resource Intensive Provisioning Systems

- *Food*
- *Built Environment*
- *Mobility*
- *Energy*

Source: IRP 2024

How?

System Change Approach



Source: Europe's Choice, Political Guidelines for the next European Commission 2024-2029

Quo-Vadis European Union



European story: European security was largely outsourced. Energy and resources were imported. Industrial production was increasingly externalised. Europe specialised in regulation, market access and coordination.

This worked remarkably well as long as three conditions held: abundant global growth, stable geopolitical guarantees, and a broadly cooperative international order.

This is no longer the case. Democratic erosion, geopolitical vulnerability and ecological constraints are converging and limiting political room for manoeuvre.

Hans Stegeman



Source: LinkedIn

Quo-Vadis European Union



Growth is expected to compensate for vulnerability, rather than vulnerability being addressed as such.

Europe's current answer is more competition, more markets and more growth. But Europe, lacking energy resources, critical minerals and dominant technology platforms, finds itself structurally exposed in this new landscape.

The current scarcity forces new strategic direction and prioritisation. In such a context, sufficiency, reducing material demand rather than merely greening supply, stops being a moral preference and becomes a strategic consideration. It is a test of political adulthood.

Quo-Vadis European Union



Rather than waiting for global alignment on sustainability, trade or industrial policy, Europe's leverage lies in showing that a high-income, democratic region can function under resource constraints.

Quo-Vadis
European Union



We are more exposed and fragile than ever and the direction we will choose will determine our future Competitiveness and strategic autonomy in Europe can only be based on responsible resource and energy use and management..

Circular Economy

From Quantitative to a Qualitative Concept,
from Examples to a Norm

Socially meaningful and politically attractive CE

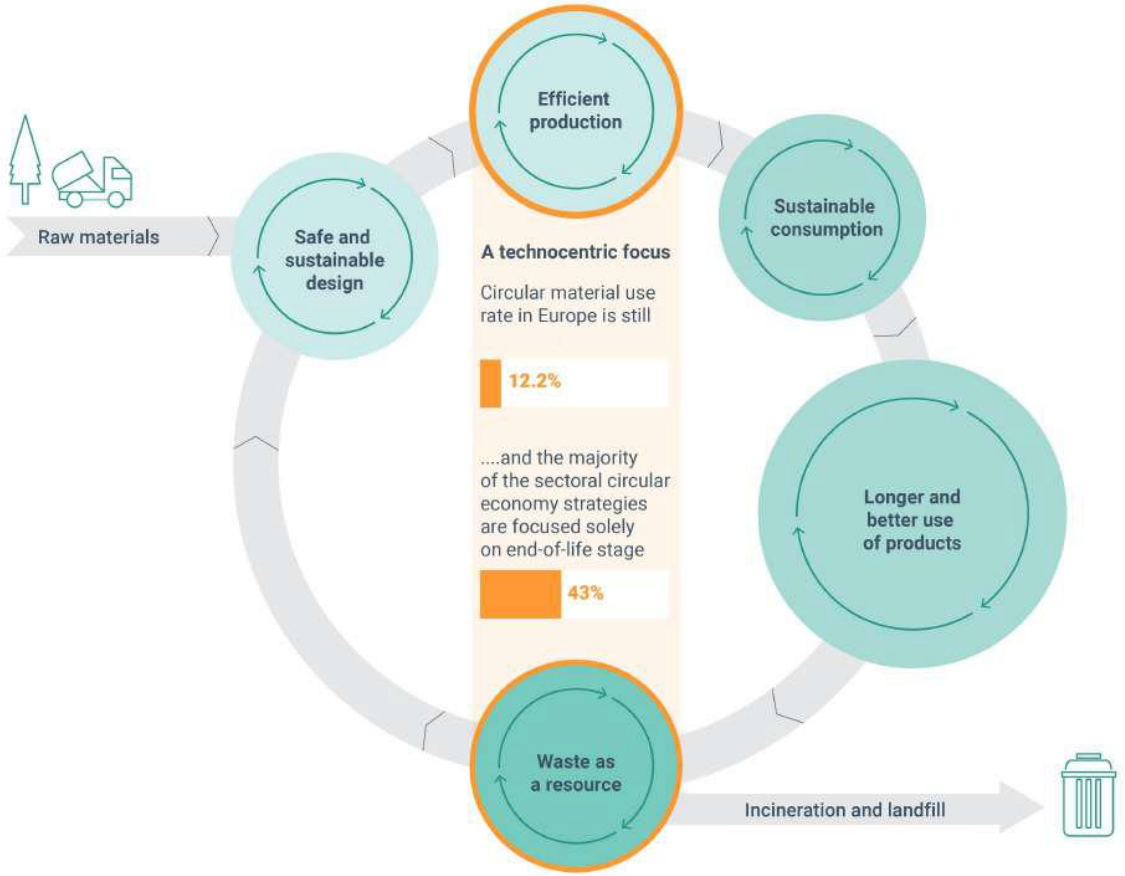


Wellbeing Economy reframes circularity around improving everyday life, not only resource efficiency. Circularity becomes the means; wellbeing becomes the goal, which upgrades circularity from mainly quantitative to a qualitative approach.

Connecting CE to affordability, housing, health, mobility and quality of life builds social legitimacy. Public support makes ambitious upstream interventions more politically durable. WE helps shift CE from a technical agenda to a systemic transformation.

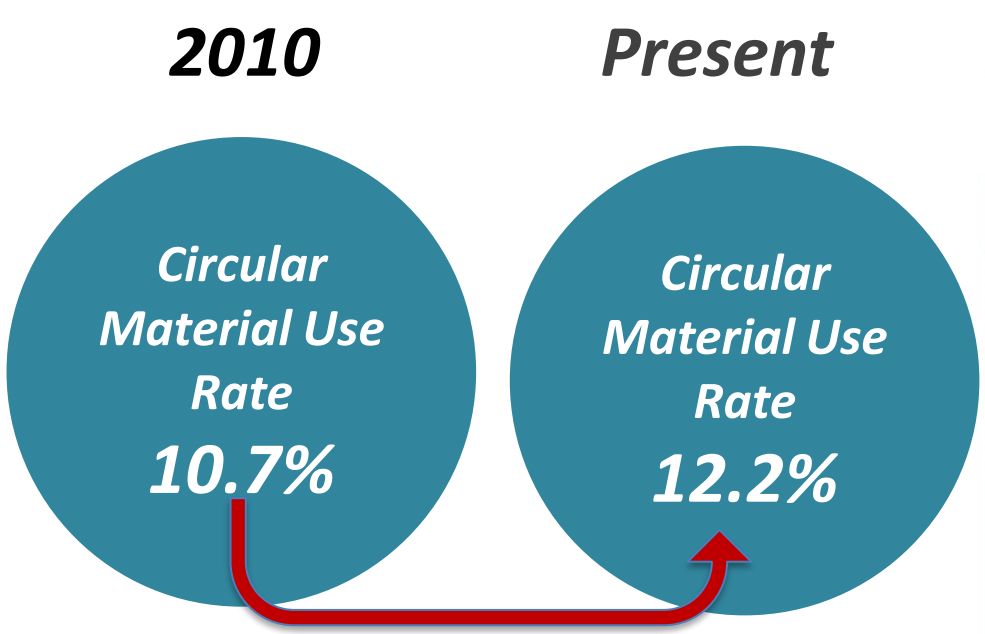
From down-stream to up-stream policies and targets

Current CE approach is dominated by downstream solutions. Policy and business focus remains concentrated on recycling and waste recovery. About 43% of sectoral CE strategies focus only on end-of-life stages. Higher-impact upstream strategies (Refuse, Rethink, Reduce) remain underdeveloped. Efficiency gains are often cancelled out by rebound effects and rising consumption.



Source: Future Impacts / Bertelsmann Stiftung: basic closed-loop cycle based on EEA 2024, Circle Economy 2024, Bahn-Walkowiak et al. 2019; data from de Pascale et al. 2023, EEA 2024

Circularity targets and developments SOER 2025 …



In EU documents, the goal for the circular the "circularity rate" is to double the share of materials coming from recycled / secondary sources by 2030, relative to the 2020 baseline.

Target is therefore to reach approximately ***24% by 2030****.*

Source: *Eurostat*

Past trends (10-15 years)

Biodiversity and ecosystems	Climate change	Environment and human heal	Circular economy and other enablers of transformative change
State of Europe's biodiversity	Greenhouse gas emissions	Emissions of pollutants to air	Circular design and sustainable production
Pollution of ecosystems	Trends in the mobility system	Air pollution and impacts on human health	Waste generation and material consumption
Protected areas	Trends in the energy system	Environmental noise and impacts on human health	Waste recycling
Water and climate impacts	Carbon dioxide removal from the atmosphere	Water pollution and human health	Circular use of materials
Ecosystems and climate impacts	Ozone-depleting substances and fluorinated greenhouse gases	Chemical pollution and huma health	Circular economy financing and strategies
Land use and land take	Climate risks to the economy	Environmental health inequalities related to air pollution	Benefits of a circular economy
Soil resources	Climate risks to society		Global impacts from EU consumption
Biodiversity investment needs	Climate action financing		Transformative innovation
	Governance of climate change mitigation and adaptation		Green employment
			Green taxation and other economic instruments
			Justice in sustainability transitions
			Financing the transition towards sustainable activities



Source: Medium, Vecteezy,

Improving trends dominate | Trends show mixed picture | Deteriorating trends dominate

From down-stream to up-stream policies and targets



Circularity rate is not the best target. It is a down-stream target, and it measures the "measurable things", mainly recycling. There is a clear understanding in the scientific community that additional efforts are needed to improve the quality of circular economy indicators to better capture also the up-stream systemic efforts. Target, as it stands, is also unachievable.

Many excellent examples of circular economy practice are encouraging, but to make circular economy a norm, we need a system change. As advised by Brazilian author Quintana: "Don't waste your time chasing butterflies. Mend your garden and the butterflies will come."

Call to Action – Based on GRO24 Recommendations

International organisations need to become proactive stewards of sustainable material use and the circular economy by pursuing four key missions:

Create, consolidate, and make accessible insights

Mission 1

BETTER ORIENTATION

National material use targets and scientific guidance, including a global orientation value

Mission 2

BETTER MEASUREMENT

Indicators measuring the ability of provisioning systems to meet people's needs in material-efficient ways

Mission 3

BETTER ECONOMIC INCENTIVES

Policy and fiscal reforms to reflect environmental and social costs in material prices and shift subsidies

Facilitates and enables

Mission 4

BETTER TRANSPARENCY AND COORDINATION

Access to consolidated material flow and impact data - provided by an International Materials Agency

Mission 1

Better Orientation: From down-stream to up-stream policies and targets

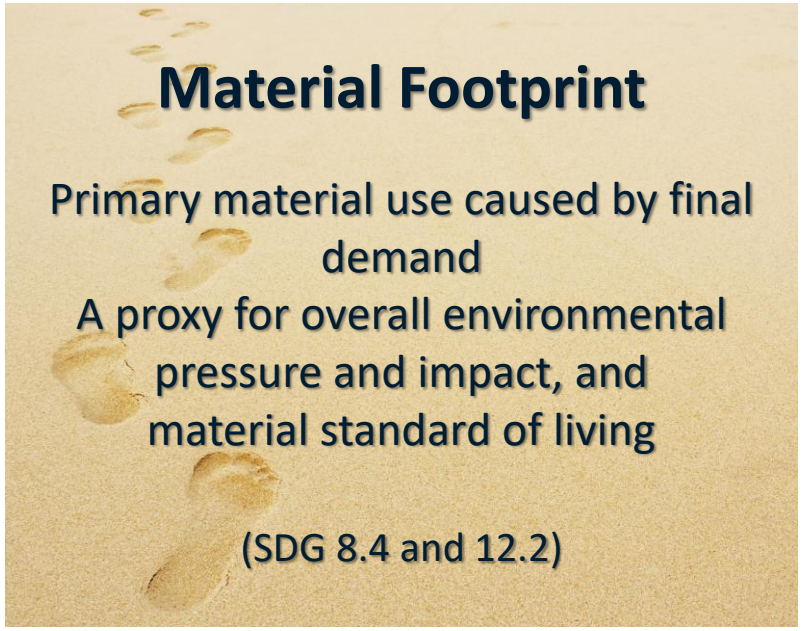
Definition: Material footprint

Primary materials associated with final demand, independently of where they are sourced (domestically or abroad)

Material Footprint = Domestic Extraction + Raw Material Trade Balance

Domestic Extraction = Material harvested (agriculture, forestry and fisheries) or extracted (mining and quarrying) domestically
Raw Material Trade Balance = Import minus exports of raw materials required to produce materials and consumer goods

Mission 1: The materials we take from nature connect the health of the planet with the wellbeing of people - relation stocks : flows



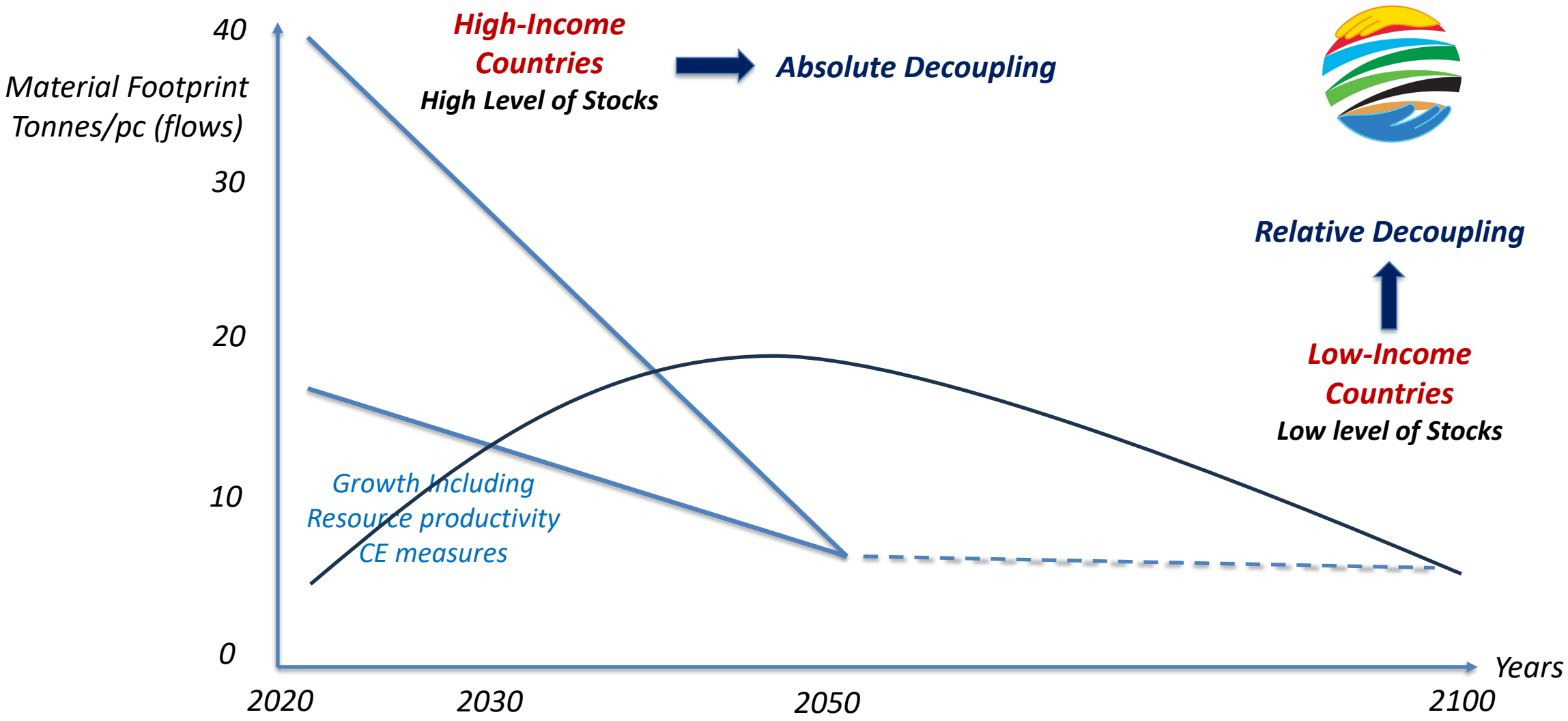


Higher materials stocks/pc result in higher level of wellbeing. Relationship among material stocks and flows is not straightforward. But potential for reducing the material footprint clearly exists.

Material footprint is in high-income wellbeing countries an important indicator of the wastefulness of material use, as well as an important indicator of the circular economy potential in using sufficiency related measures.

Mission 1: Defining Resource Use Paths - Better Orientation

Setting the North Star for material use/decoupling based on Material Footprint

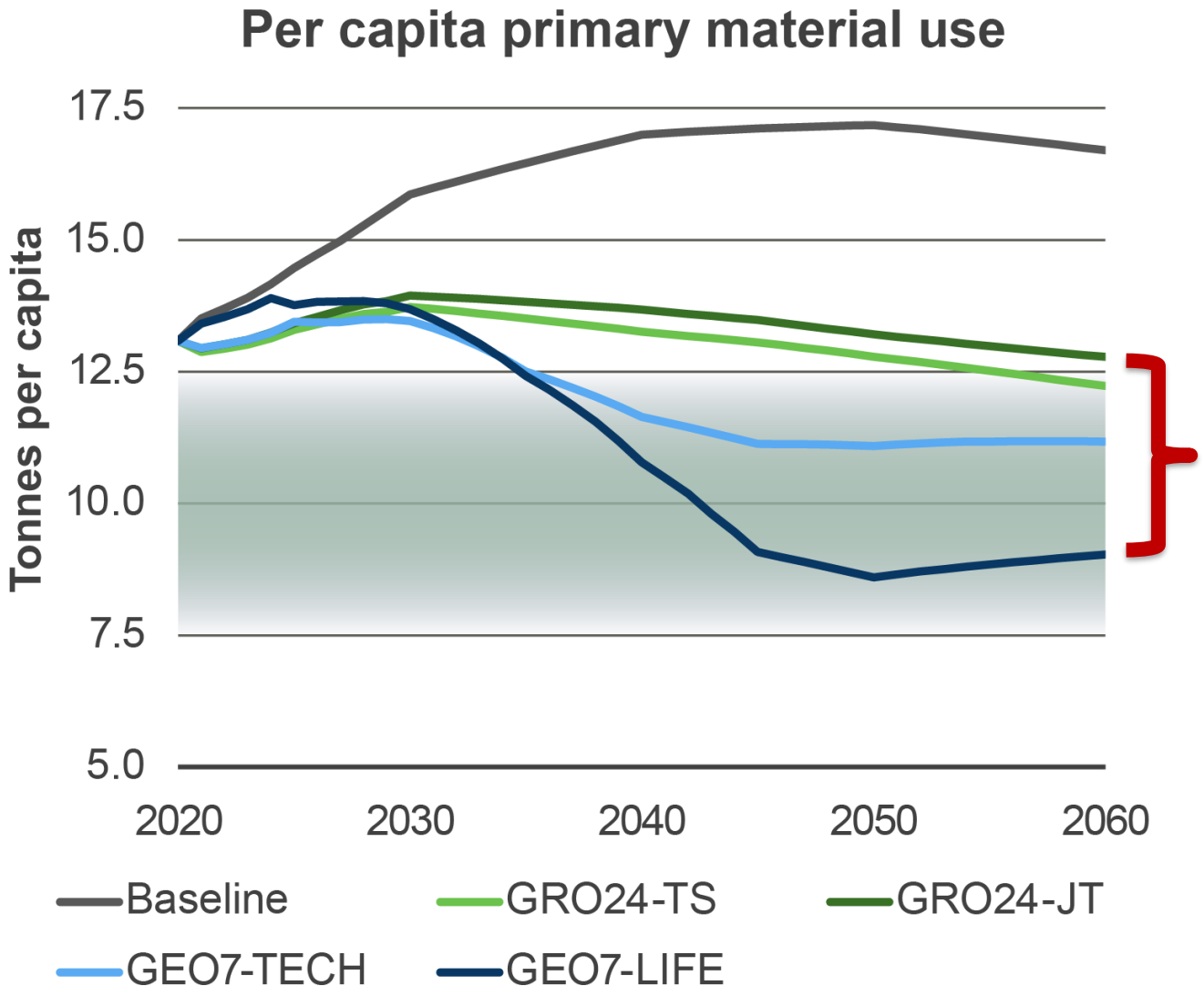


Mission 1: Developing a Corridor for a Material Use Target

by different scenario modelling, 2020-2060

Per-capita material Footprint by income groups in 2020

***HIC** 22.9 t/cap*
***HMIC** 18.5 t/cap*
***LMIC** 6.2 t/cap*
***LIC** 4.9 t/cap*



Global Material Use Baseline in 2060
160.5 billion tonnes

GRO24-JT
122.8 billion tonnes
GRO24-TS
117.5 billion tonnes
GEO7-TECH
107.3 billion tonnes
GEO7-LIFE
86.8 billion tonnes

CSIRO

Mission 4

Better Transparency and Coordination
Improving the material governance

Mission 4: A "one-stop shop" public data infrastructure for insights on material flows and their environmental impacts

GLOBAL MATERIALS DATA HUB
International Materials Agency

1. Market information system *(initial focus)*

1. *Sourcing and consolidation of publicly available (and where feasible proprietary) data*
2. *Analytics that addresses the most urgent needs of decision-makers in policy, finance, business*
3. *Collaboration with all relevant actors and initiatives in the existing "transparency ecosystem"*

2. Coordination facilitator *(potential development)*

1. *Primary data collection and standards development / harmonisation*
2. *Scientific analyses, scenario developments, policy recommendations and coordination*
3. *Global commodity price observatory (incl. promotion of price transparency)*

Call to Action Co-creators and supporters *(currently 40+ organisations and 70+ individuals)*
Interested government related: *UNEP, Germany, Netherlands, Belgium, Brazil, South Africa …*
Interested business associations: *ICC, ICMM, IGF …*
Interested financial organisations: *Global Investor Commission on Mining 2030*

Mission 4: Emerging GMDH coalition for material governance ***project***

Steering Committee

Provides oversight of the project, makes strategic decisions

ICC — *(Co-lead, business)*

UN environment programme — *(Co-lead, intergovernmental)*

Mining 2030 — *(Co-lead, finance)*

International Resource Panel / SYSTEMIQ — *(Co-lead, science and development)*

Advisory Group

Provides expert guidance to the project

ICMM — *Business*

IGF — *Intergovernmental*

Governments

NRGI — *Civil society*

Others ...

To be confirmed

Feedback Group

Provides user perspectives and technical feedback

Users (policy, finance, business)

Analytics

CHATHAM HOUSE, IEA, CSIRO, CLIMATE TRACE, trase, UN environment programme, WORLD RESOURCES INSTITUTE

Standards / Frameworks

TNFD, UNTP, IRMA, EITI, WBCSD, Consolidated Mining Standard Initiative

Databases

Global Tailings Portal, UN environment programme, GTAP, exiobase, USGS, OPEN SUPPLY HUB, PACT, The Eora Global Supply Chain Database

To be confirmed

The aim of the project:

- *Scanning the existing landscape*
- *Analysing the needs of governments, business and financial community*
- *Analysing and proposing the governance options, IMA being one of the options*
- *Developing a proof-of-concept on one selected material*
- *In short: preparing a convincing argumentation for all stakeholders to consider the establishment and proposing also potential solutions for the GMDH / IMA*

Circular Economy Act

Opportunity to Mend our Garden

Quo-Vadis European Union



2025 State of Union Address by President von der Leyen

I am convinced: the future of clean tech will continue to be made in Europe. But for that, we also need to make sure that our industry has the materials here in Europe. And the only answer here is creating a truly circular economy.

So, we need to move faster on the Circular Economy Act.

Circular Economy Act: Opportunity to Mend our Garden

Opportunity and need to define circular economy as a quality driven concept beyond technical, quantitative optic, to define resource use path, and propose improving resource governance

Dimensions	
1 ***BETTER: Minimise product need through better system design***	***Refuse and Rethink strategies***
2 ***LEANER: Optimise product design***	***Reduce strategies in manufacture and use***
3 ***LONGER: Maximise lifespan of products and its parts***	***Reuse, Repair, Refurbish, Remanufacture, Repurpose and Recycle strategies***
4 ***CLEANER: Minimise waste and pollution***	***Recovery strategies***

Resource Efficiency

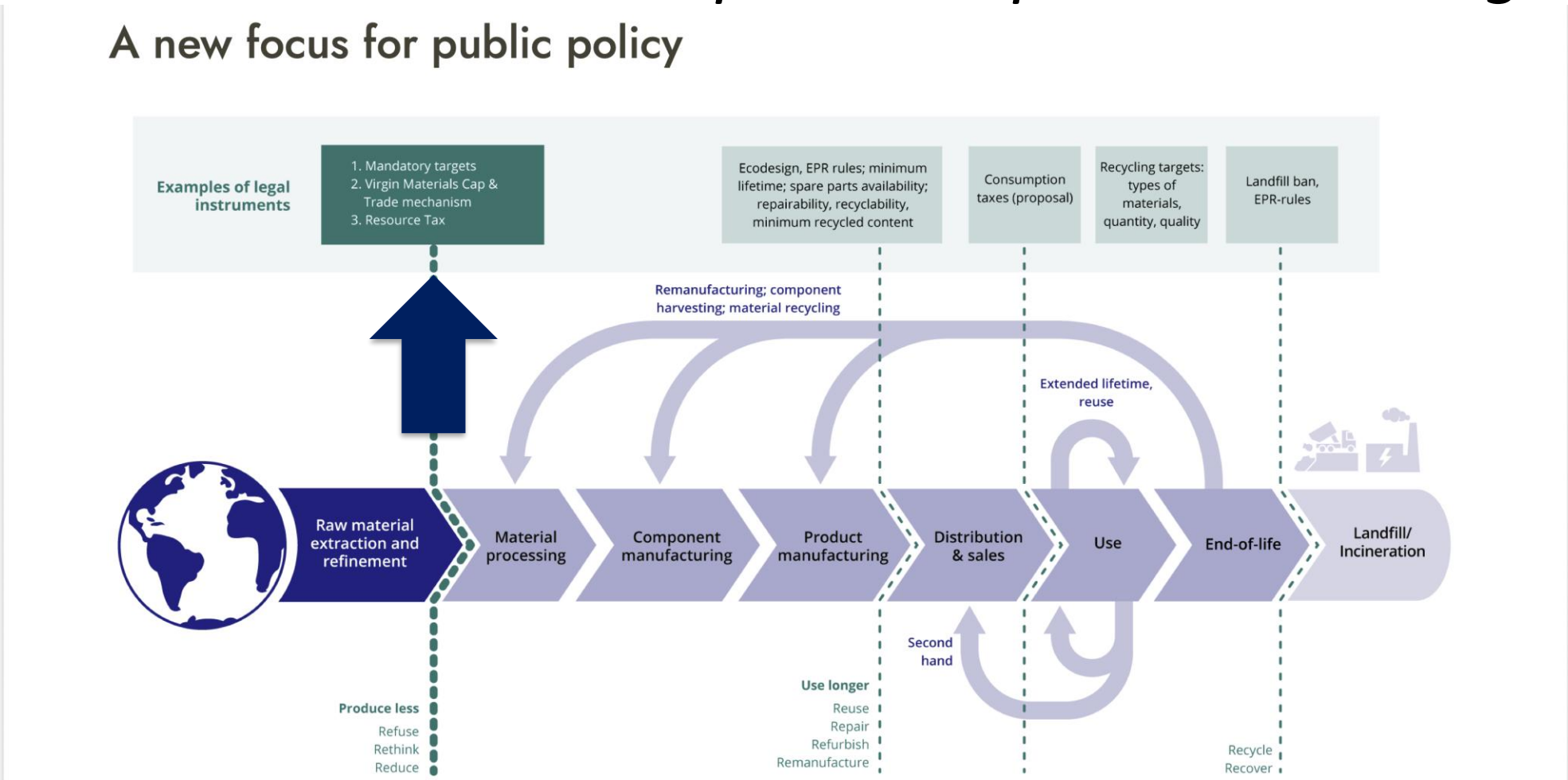
Still not much present, but critical for effectiveness



From down-stream to up-stream policies and targets
Council of the European Union, June 2024

"ACKNOWLEDGES that the EU's material and consumption footprints are still far beyond what is sustainable within the planetary boundaries and that progress on circular material use is too slow to achieve the objectives of the 8th EAP [Environmental Action Programme]*; therefore UNDERLINES the need to decouple growth from resource use and its impacts by stimulating technologies and business models that make it possible to reduce resource demand at production and consumption levels and* ***RECALLS the commitment in the 8th EAP to significantly decrease the Union's material and consumption footprints so as to bring them into planetary boundaries as soon as possible, including through the introduction of EU reduction targets,*** *as appropriate, while tackling underlying systemic factors supporting the linear economy; UNDERLINES the need to promote a sustainable and circular bio-economy and nature-based solutions";*

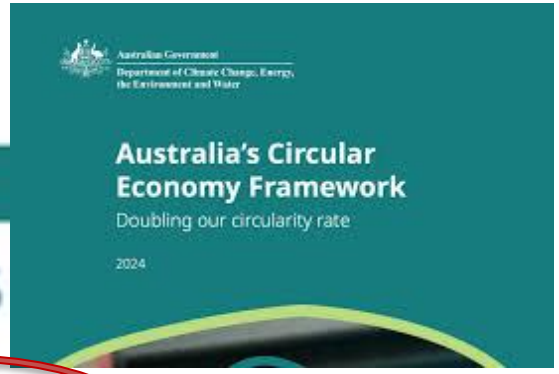
From down-stream to up-stream policies and targets



Source: RISE - Leading Research Institute in Sweden, a government-owned company that performs industry research and innovation, testing and certification in various fields: Karel Edsjö, Ann-Charlotte Mellquist, Emanuela vanacore: Why upstream policy is the missing link in the circular economy, and what to do about it – How to stimulate industrial innovation within planetary boundaries, May 2026

From down-stream to up-stream policies and targets

Targets Example Australia 2024



Goal

Double the circularity of the economy by 2035

Shrink our per capita Material footprint by 10%
Front-end target

Lift our material productivity by 30%
Middle target

Safely recover 80% of our resources
End target

Industry
- Circular packaging
- Durable, re-usable and sustainable goods

Built environment
- Refurbishing and adaptive re-use
- Circular, low carbon construction material fit-outs

Food and Agriculture
- Reducing food waste
- Valorising agri-waste

Resources
- Minerals beneficia
- Co-extraction and resource sharing through precincts
- Second-use of mi containing produ

From down-stream to up-stream policies and targets

Replace current target increasing circularity rate from 12% 2020 to 24% 2030. Instead introduce a more appropriate and more ambitious target aligned with EU priorities of security, resilience, competitiveness and strategic autonomy. Propose decreasing material footprint by x % by 2030 (and 2050). Potentially introduce differention among countries in EU with higher and lower material footprint.

Activelly advocate similar approach for developed countries at the global level, while for developing countries, which still need more resources for their development needs, propose a target of y % increase of yearly resource productivity following circularity logic.

Better Transparency and Coordination through Improving the material governance

Circular Economy Act should address also the question how to improve the missing governance in the area of materials.

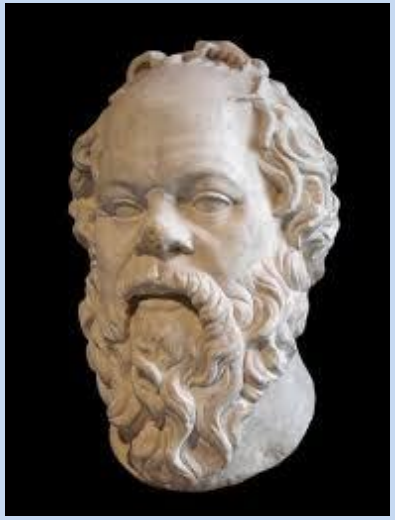
There is a real need, and many are already calling, for more transparency and order in materials management. Calls for establishing something like Global materials Data Hub or International Materials Agency, are coming from business and financial community, as well as from the governmental side.

And companies, financial institutions …

They (obviously) understands the need for sustainability and are not against the direction which they also see as unavoidable.

What they need is in the first-place predictability, as good as it gets level playing field, financial support easing the transition and simplified rules, not deregulation. Changing strategic direction and conflicting messages from policymakers are not useful, nor helpful.

In short: Do not kill industry with kindness! We have tried that for quite some years and almost succeeded.



Attributed to Socrates

Strong minds discuss ideas, average minds discuss events, weak minds discuss people.



Søren Kierkegaard

Take a chance and you may lose. Take not a chance and you have lost already.

Source: Wikipedia

To Conclude



Source: Disney.com

It is not easy being green

Quo-Vadis European Union



We must move from discussing how to de-commission, deregulate Europe, to how continue building it, make it stronger. From constant adaptation to an active creation.

Showing that Europe can function under resource constraints, implementing circular economy concept in a holistic way, is our chance to lead … not just to follow.

This is the ultimate question implicitly addressed by the initiative to improve materials governance

Rule Based or Power-Based World?

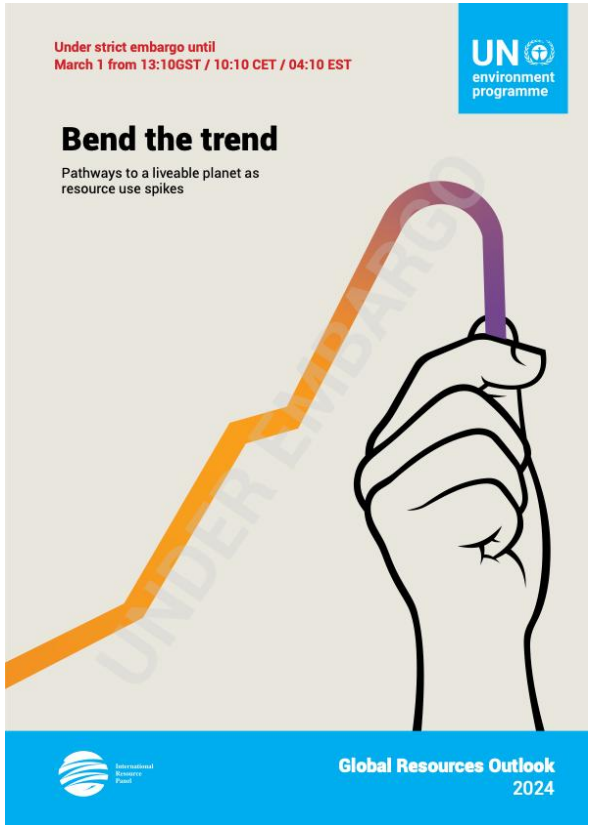


Source: grounded architecture

We need hope and compass.

We should not allow hope to be replaced by fear …

and compass set by values, rule of law, science and cooperation, to be replaced by the turbulent future designed, and kidnaped, by the storm of power.



We are indebting future generations, financially and by depleting the Nature. This is simply wrong.

Apparently, we humans are the most intelligent species on this planet. It is high time to prove it.

More than an economic or a technological choice, this is an ethical choice.

And it is simply not good enough to constantly hear the same answer

Yes, you are right, but …

And finally, with the most important advice from the famous Belgian, country hosting me last two decades

HERCULE POIROT



When asked why he is speaking about himself always in a third person he replied something like that:

If one is such a genius like me, it is very important to establish a healthy distance to himself.



THANK YOU

for helping us delivering the future we want!