UN environment

International Resource Panel

European Commission

THE CLUB OF ROME

SYSTEMIQ

Accelerating the Transition to a Green & Circular Economy

Delivering our Global Sustainability Commitments

The Circular Economy Imperative

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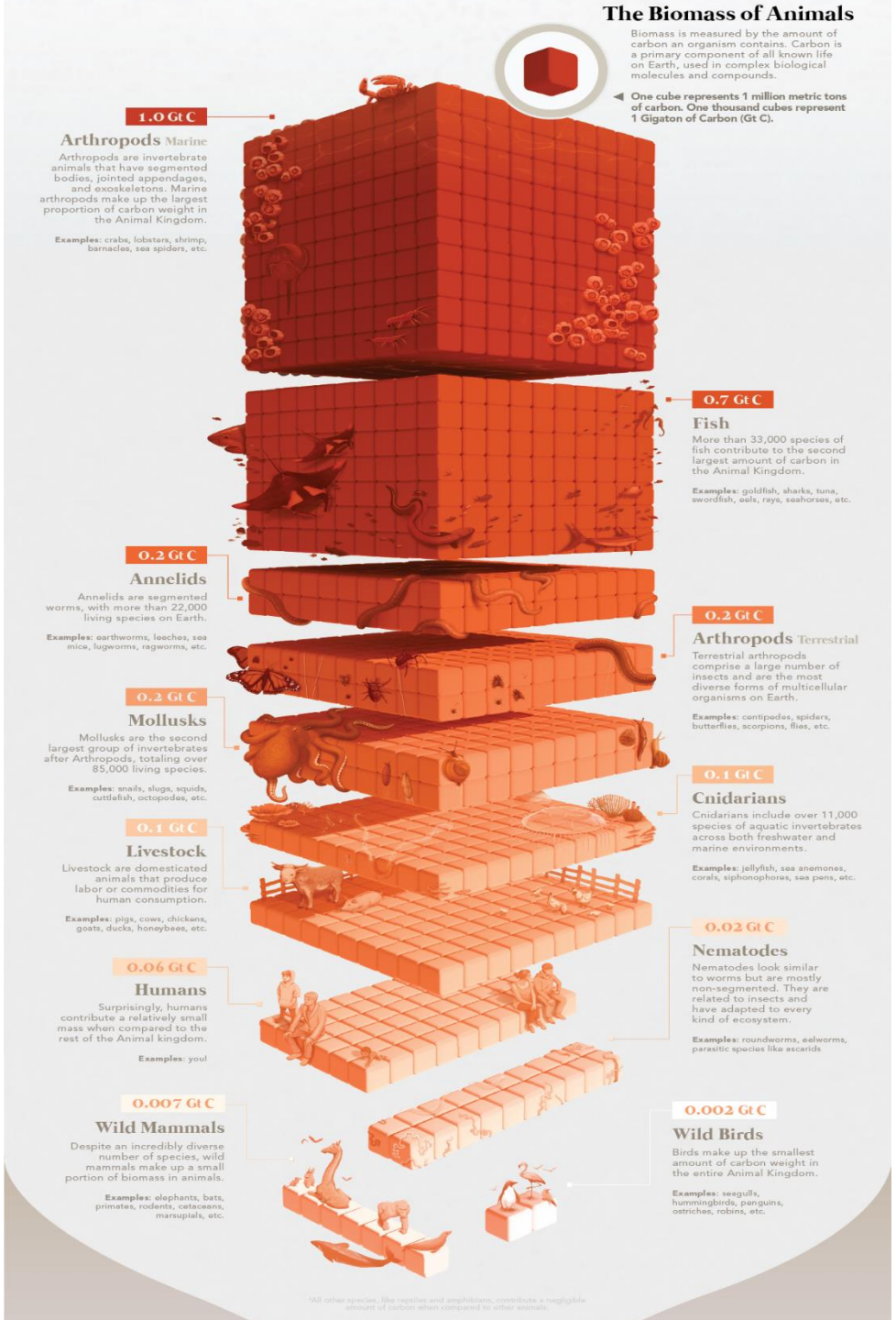
Partner SYSTEMIQ

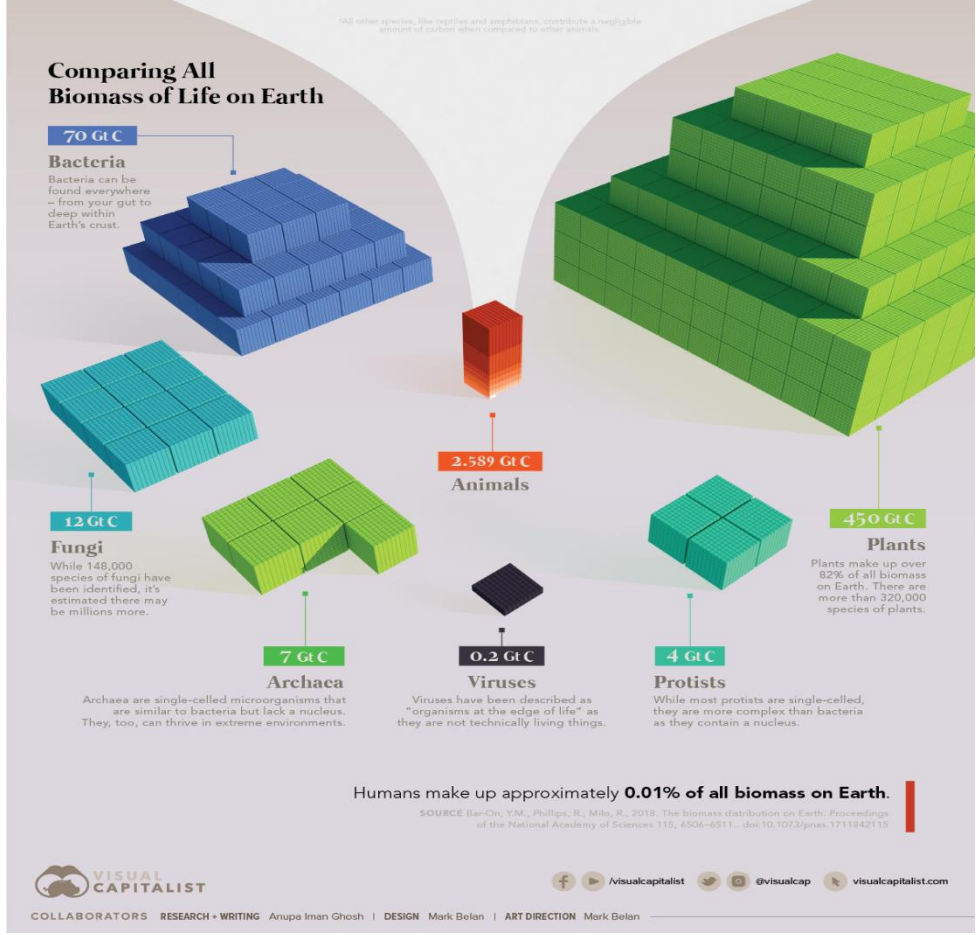
Member Club of Rome

Brussels, 29th March 2023

Main Challenges

The diagnosis of the resource challenge

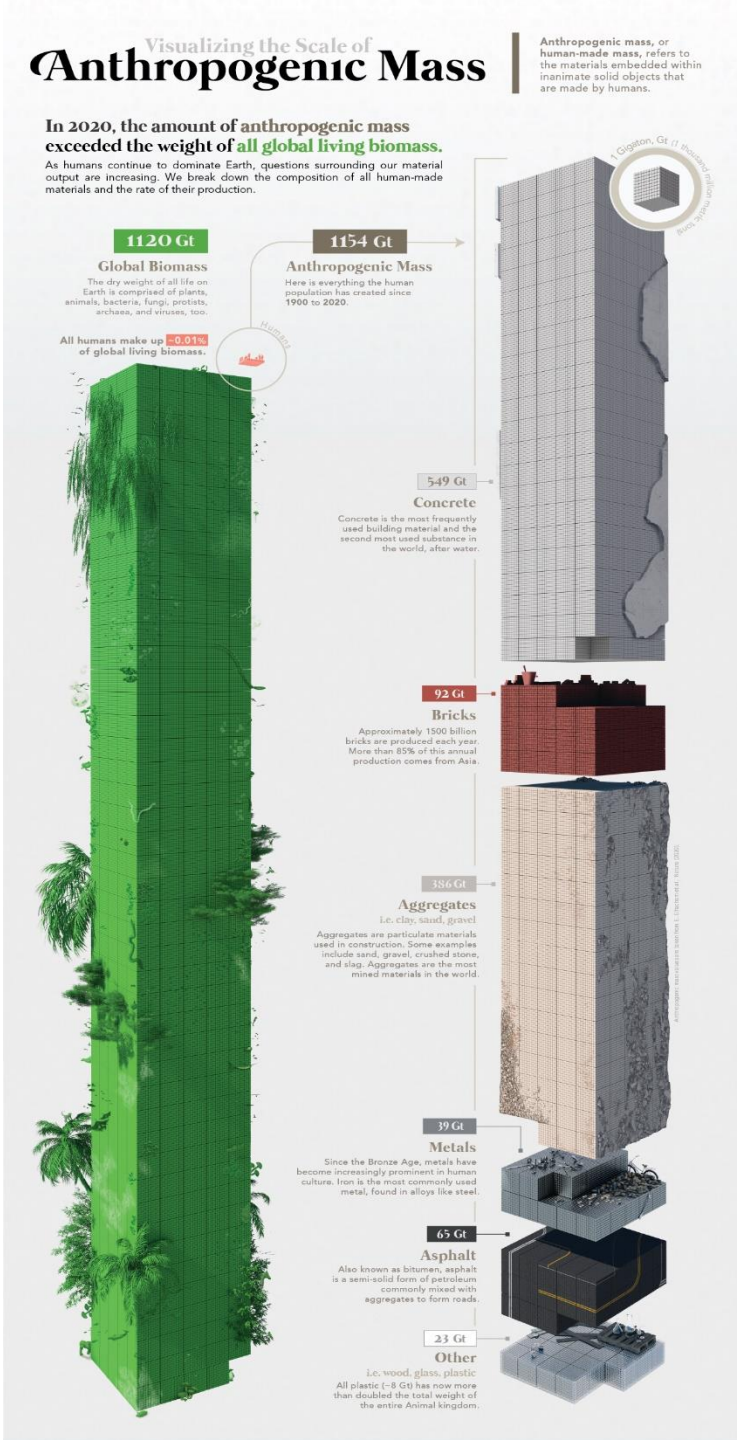


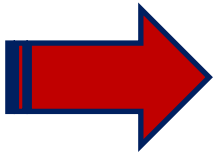


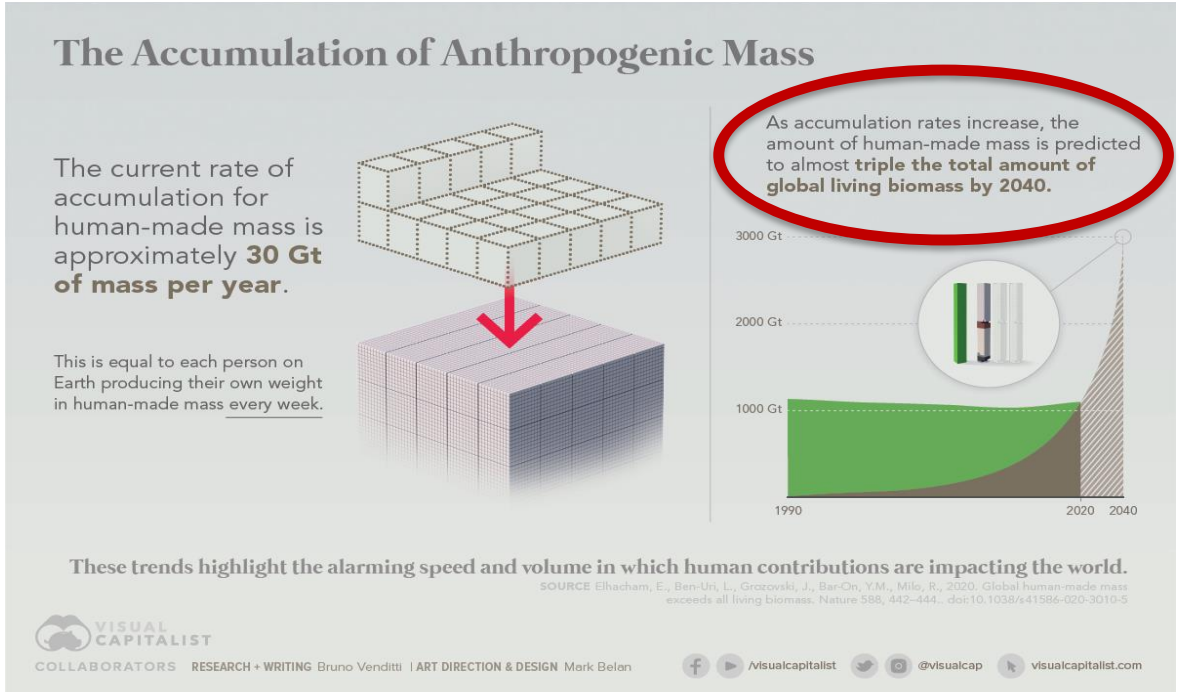
Biomass of Life

Humans in Perspective

Source: Visualcapitalist.com

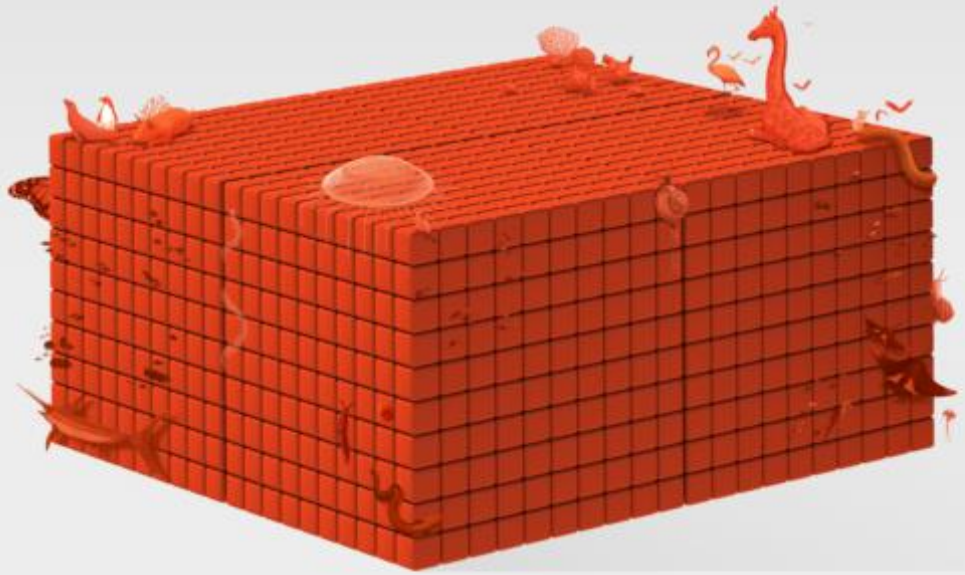




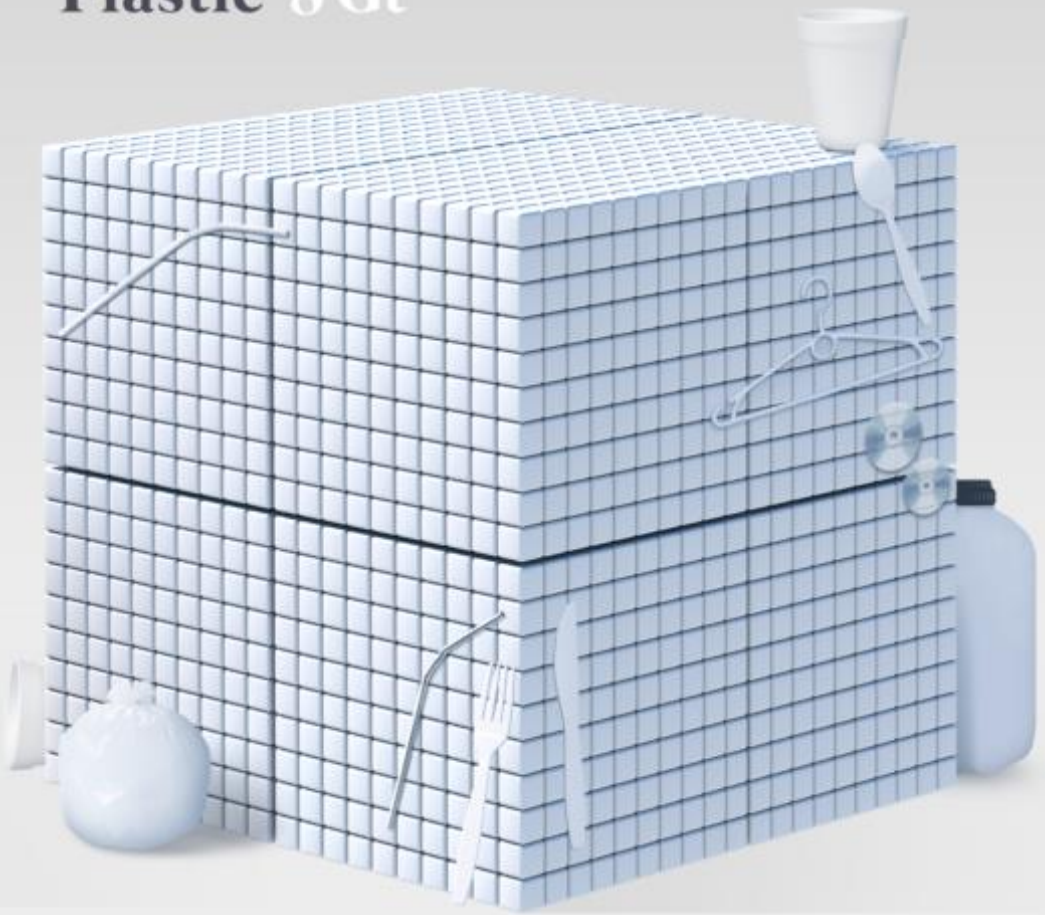


Source: Visualcapitalist.com

Animal Kingdom 4 Gt

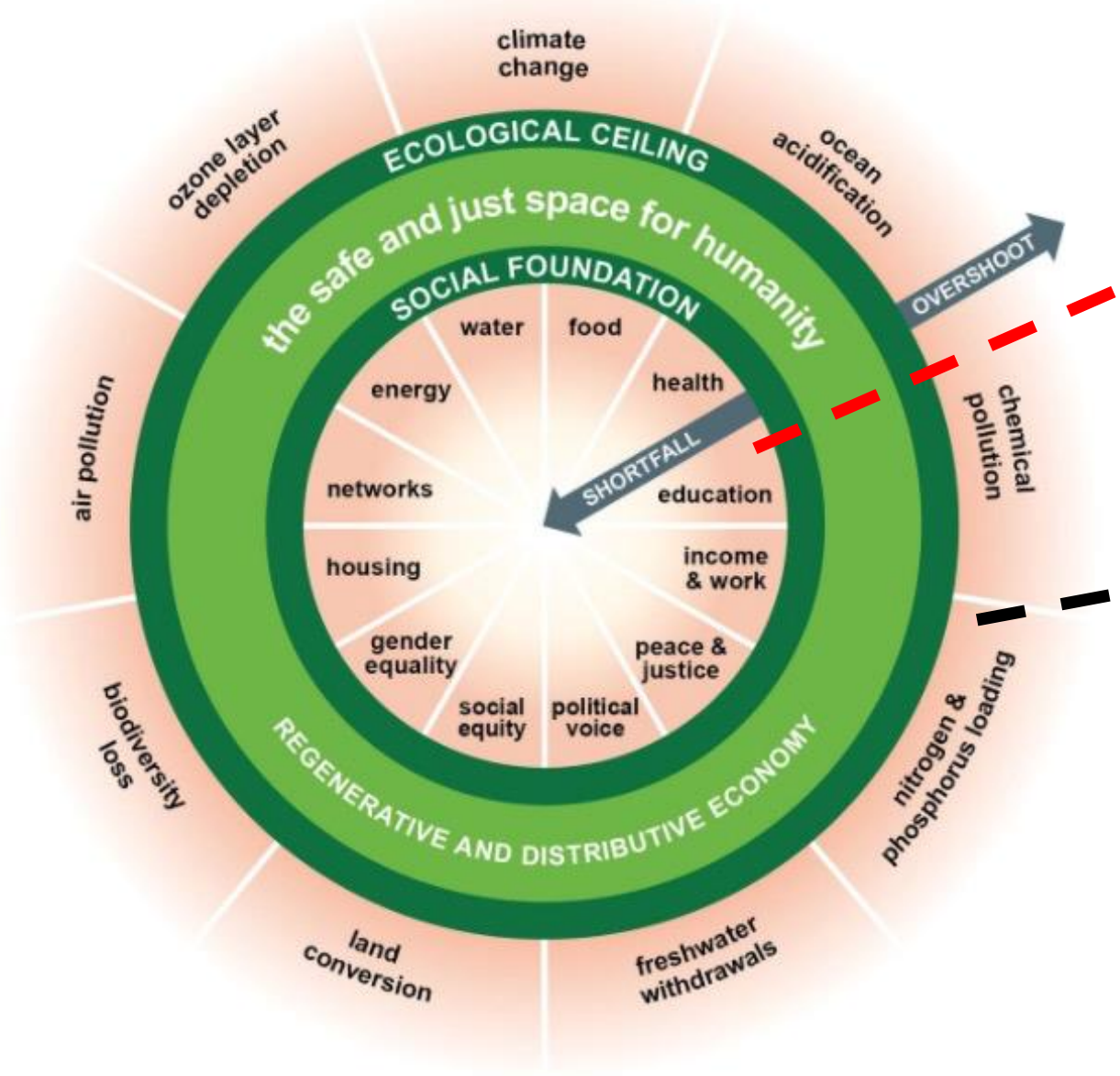


Plastic 8 Gt



Source: Visualcapitalist.com

A "doughnut" compass for human prosperity

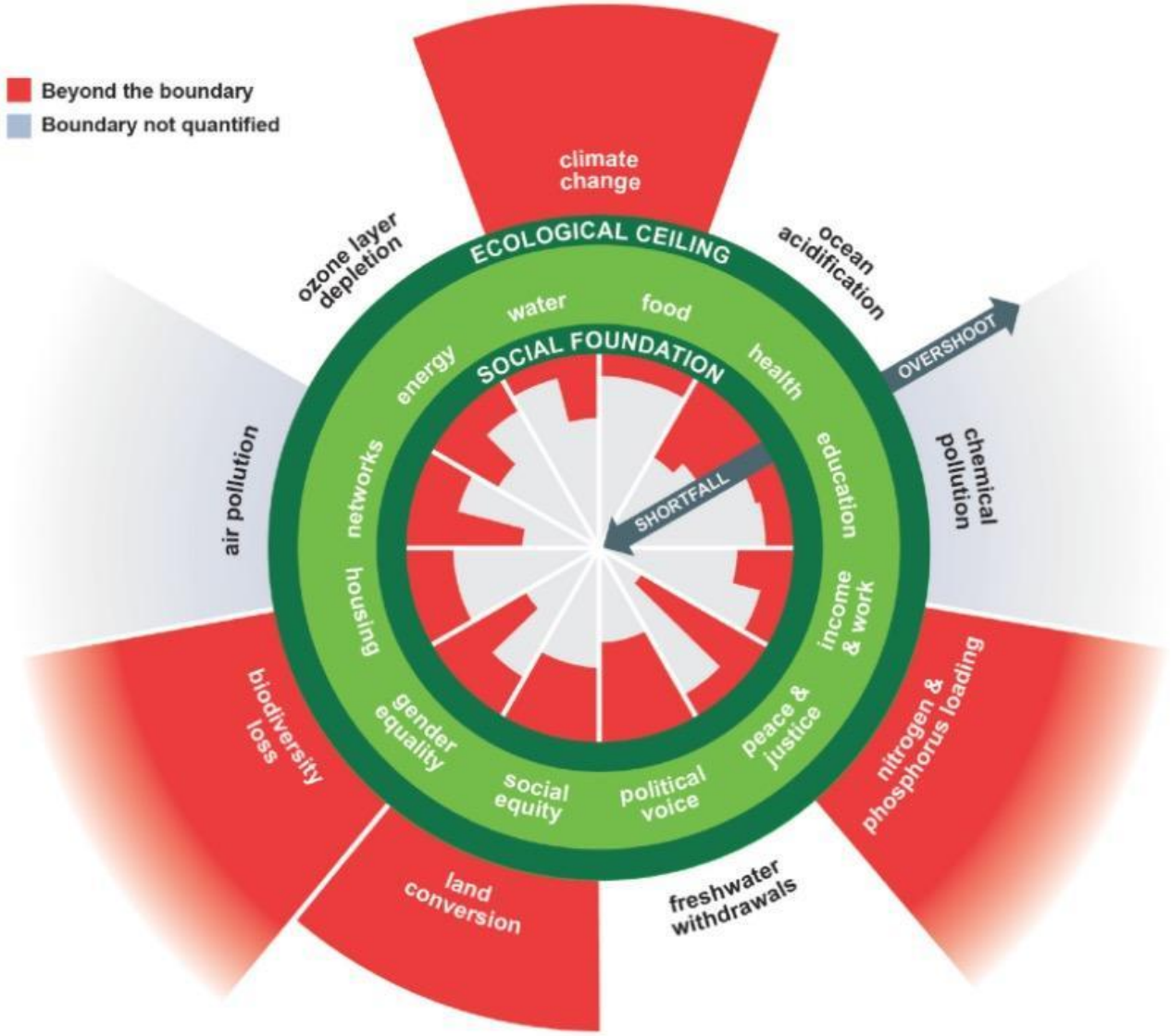


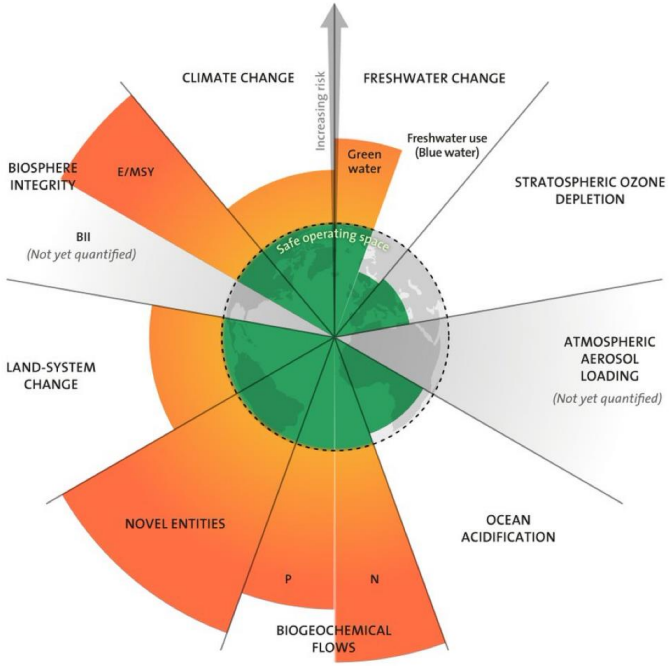
Basis human needs incl. minimum requirements of resource supply

Outer limit by Planetary Boundaries

Adapted from Raworth 2017

Humanity is living far out of balance

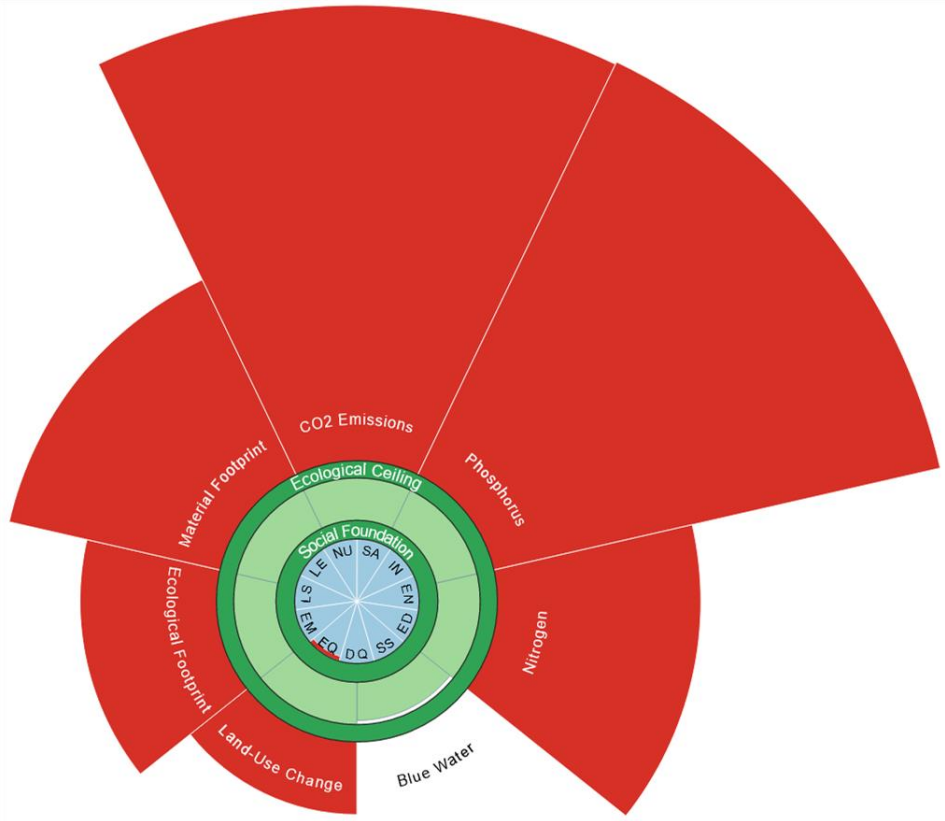




Source: Potsdam Institute for Climate Impact Research, 2022 reassessment

DOUGHNUT ECONOMICS ACTION LAB

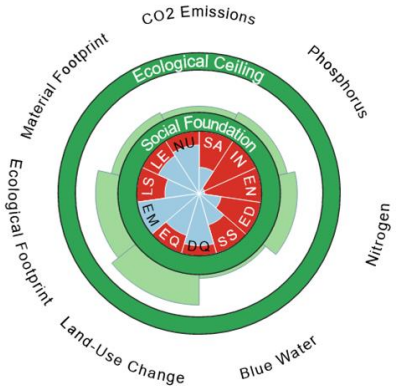
Divergent national contexts



Source: Doughnut Economics Action Lab, University of Leeds (goodlife.leeds.ac.uk)

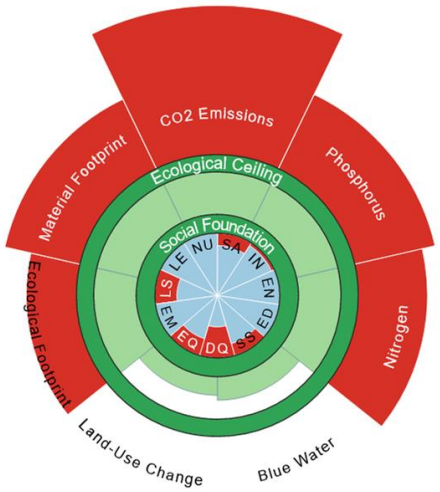
Divergent national contexts

goodlife.leeds.ac.uk



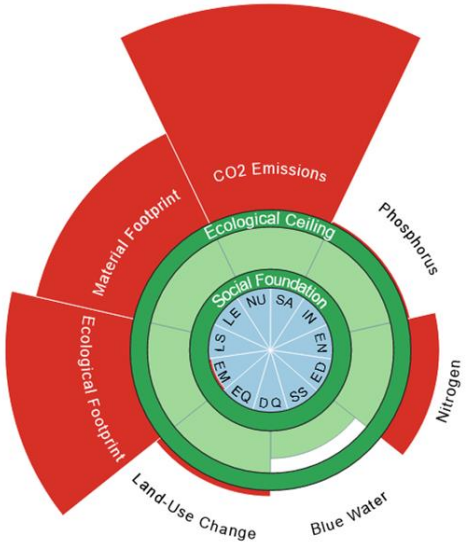
Malawi

$1,000 pc



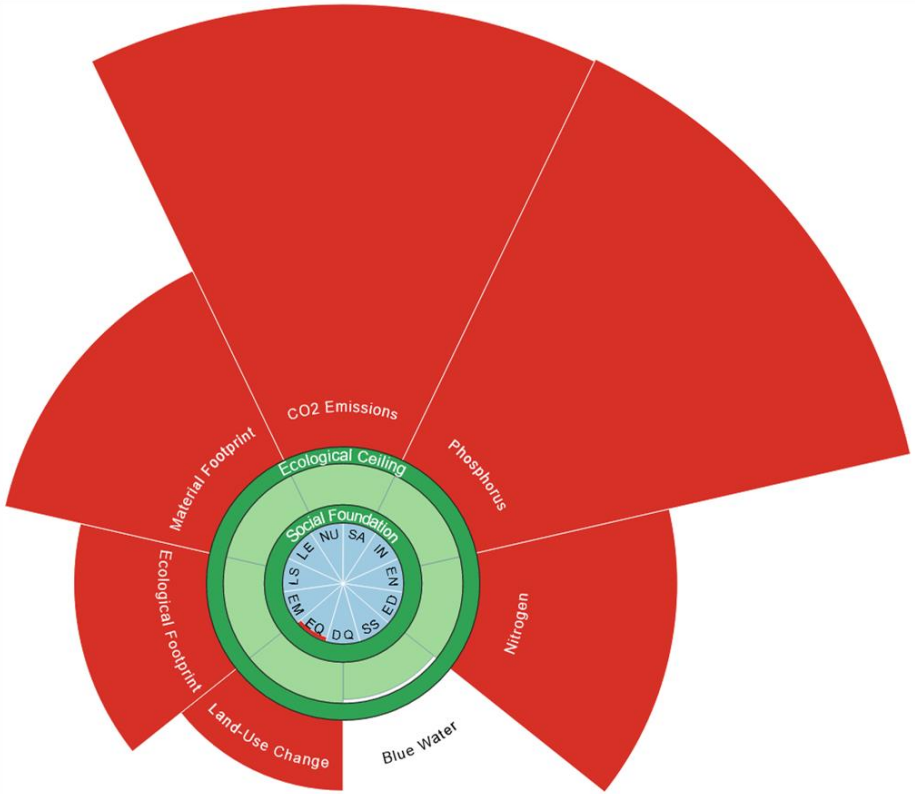
China

$17,200 pc



Belgium

$54,000 pc

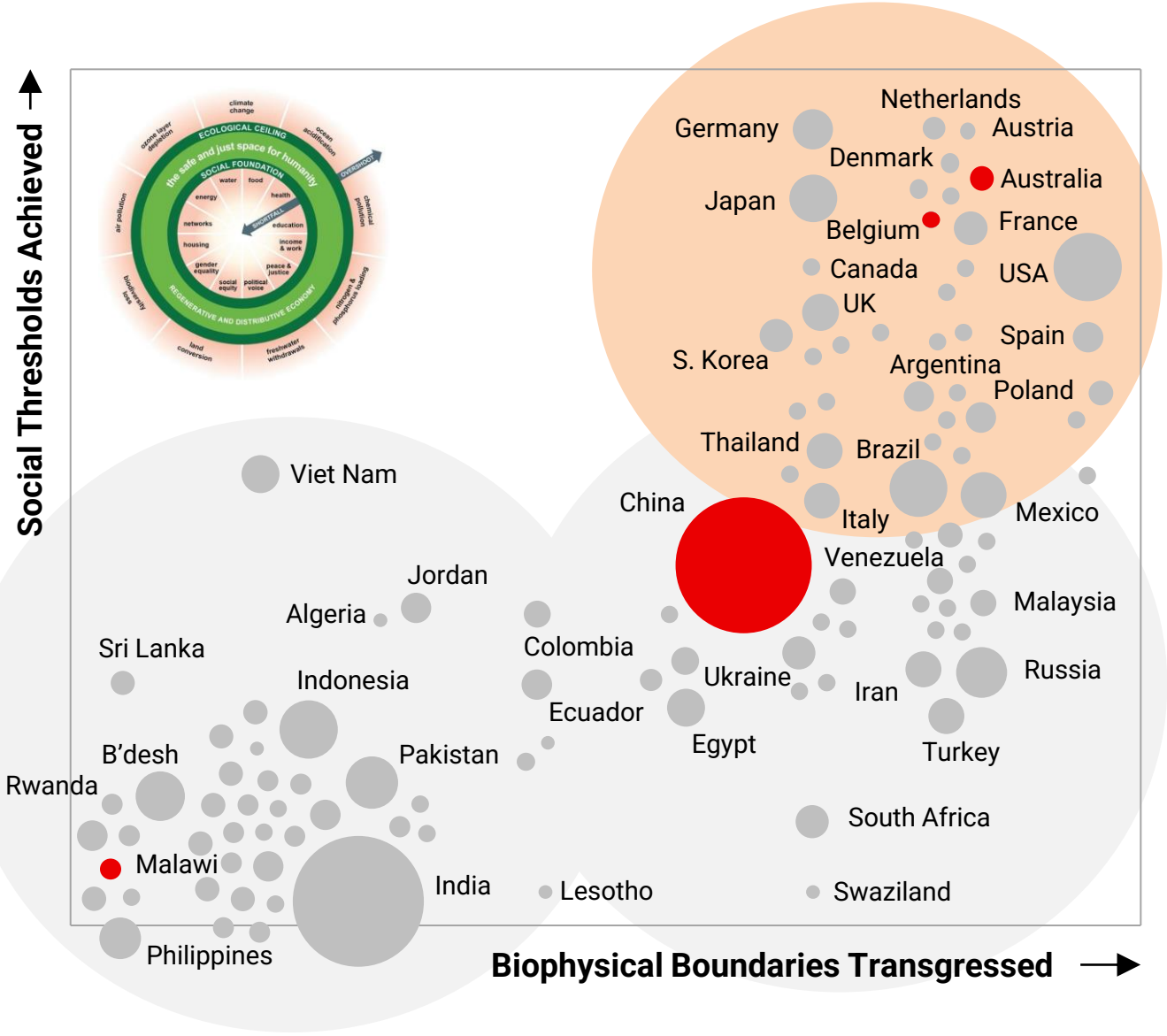


Australia

$54,900 pc

Source: Doughnut Economics Action Lab, University of Leeds (goodlife.leeds.ac.uk)

Humanity's sweetspot



colonialism

military power

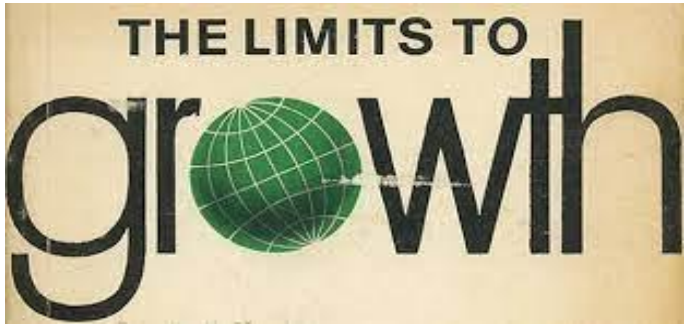
trade & finance rules

resource extraction

climate-change impacts

The World has Changed

1972



Population on the Planet 3.8 billion

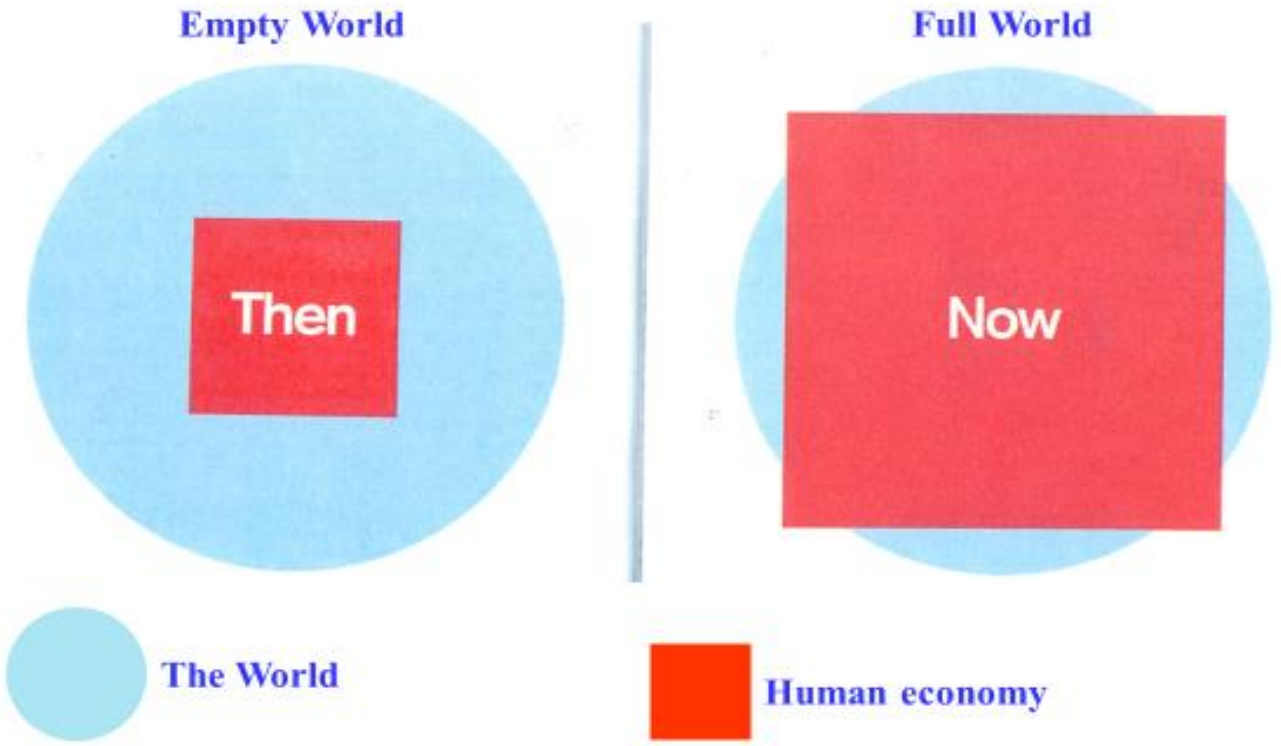
2022

*The **Growth of Limits***

Climate Change,
Pandemics, Biodiversity
Loss, Security Threats …

Population on the Planet 8 billion

From "Empty" World to "Full" World



Source: Club of Rome: Simplified after Herman Daly

Labour and Infrastructure limiting factors of human wellbeing → *Natural resources and Environmental sinks limiting factors of human wellbeing*

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.

Resource Perspective

The Common Roots of the Triple Planetary Crises

Natural Resources:

Provide the foundation for the goods, services and infrastructure that make up our current socio-economic systems

Biomass (wood, crops, including food, fuel, feedstock and plant-based materials)

Fossil fuels (coal, gas and oil)

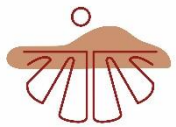
Metals (such as iron, aluminum and cooper…)

Non-metallic minerals (including sand, gravel and limestone)

Materials

Extracted from earth

Water and Land



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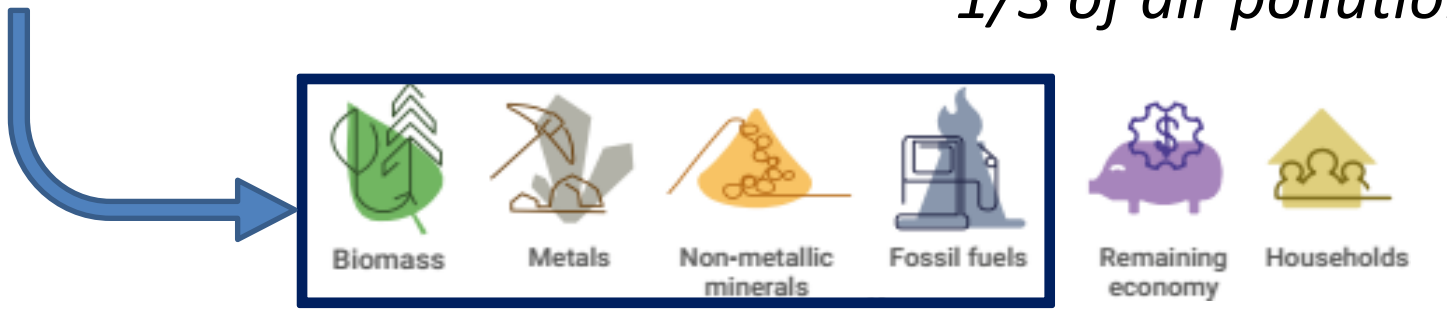
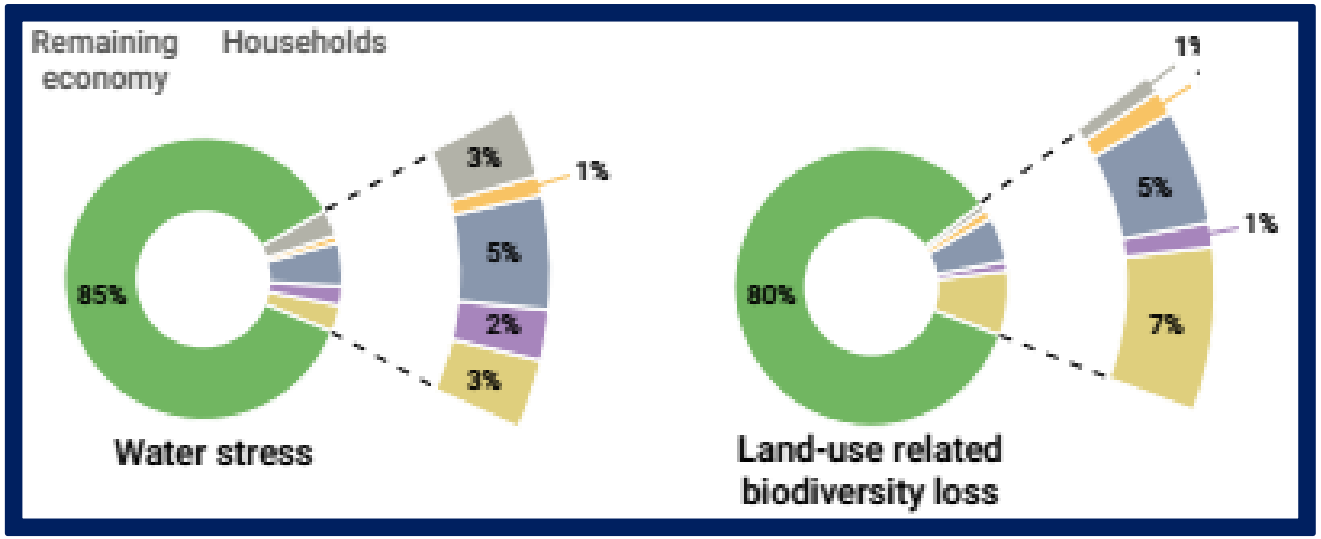
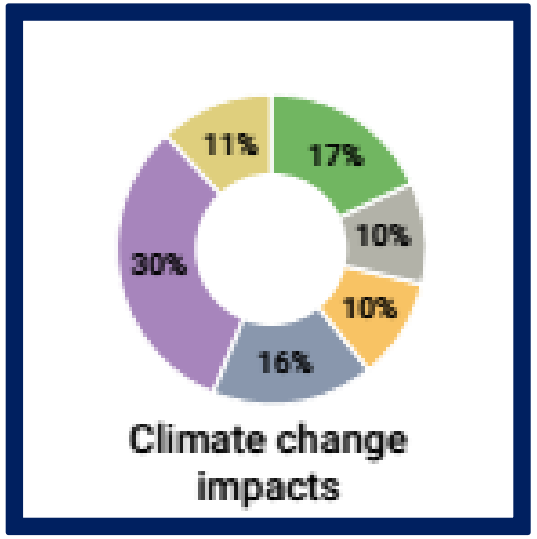
Extraction and Processing of Natural Resources Drives all Aspects of the Triple Planetary Crisis

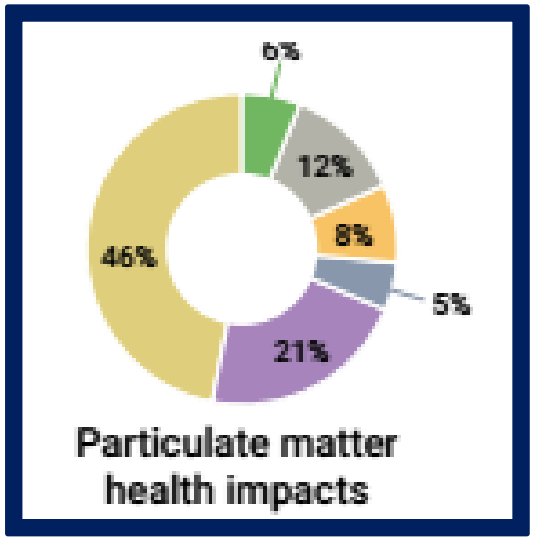
Environmental impacts of materials in the value chain in extraction and processing phase

90% of global land related biodiversity loss and water stress
50% of global climate change impacts
1/3 of air pollution health impacts

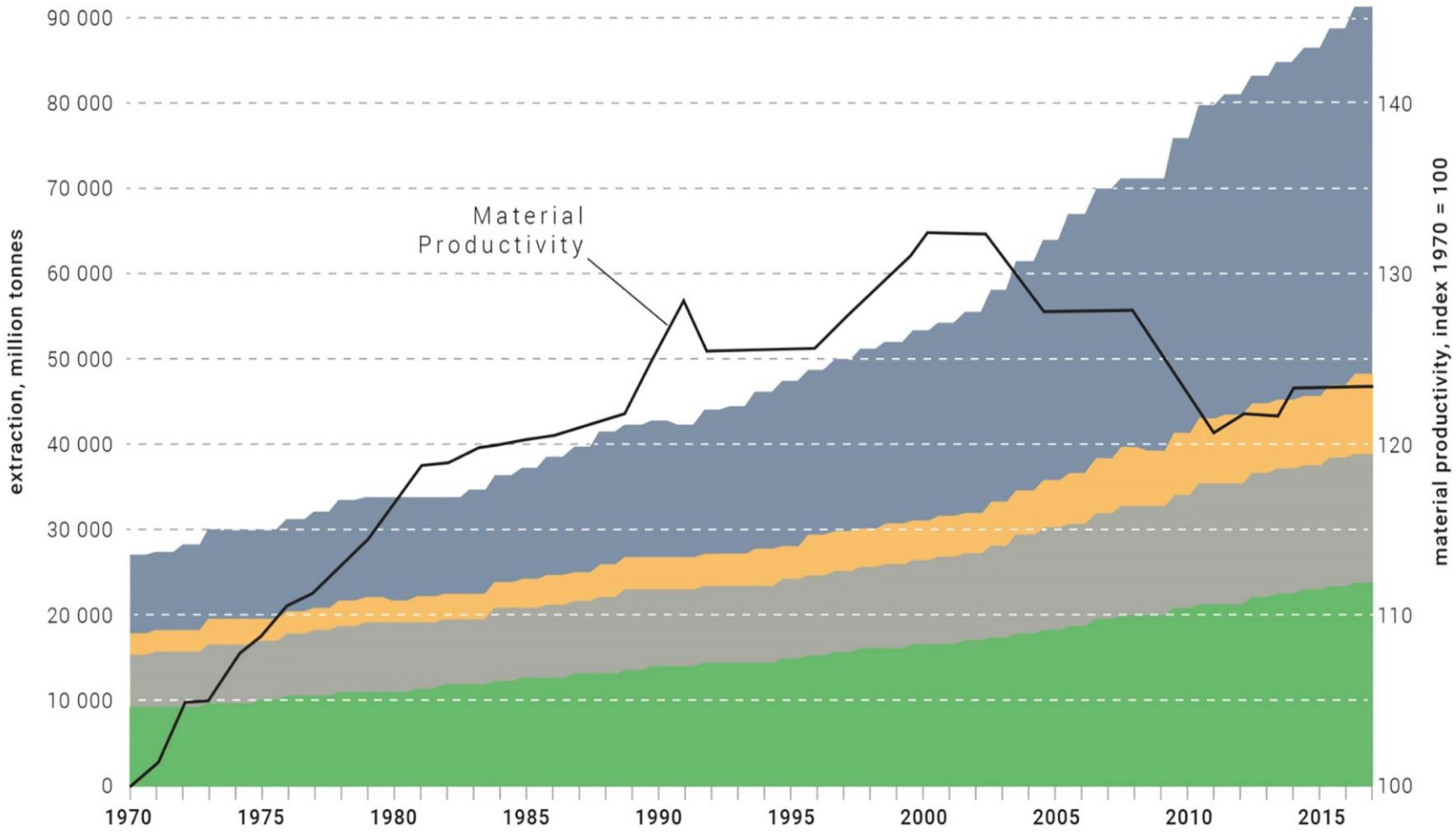








Global Material Use, Demand per capita and Material Productivity in the years 1970-2017



Global material use has more than tripled since 1970

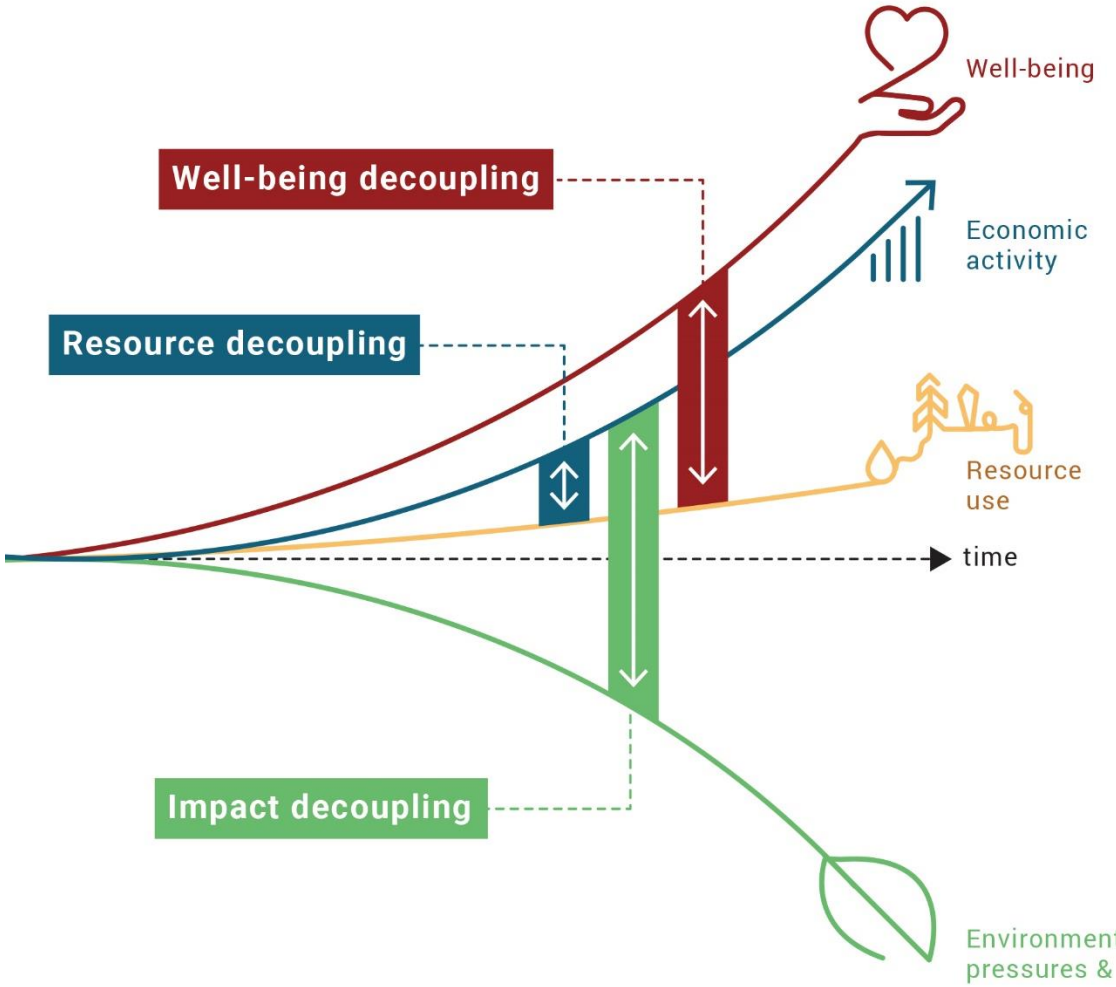
Global material demand per capita grew from 7.4 tons in 1970 to 12.2 tons per capita in 2017

Material productivity started to decline around 2000 and has stagnated in the recent years

- *Non-metallic minerals*
- *Metals*
- *Fossil fuels*
- *Biomass*

If current trends would continue, global material consumption is predicted to double by 2060

Decoupling



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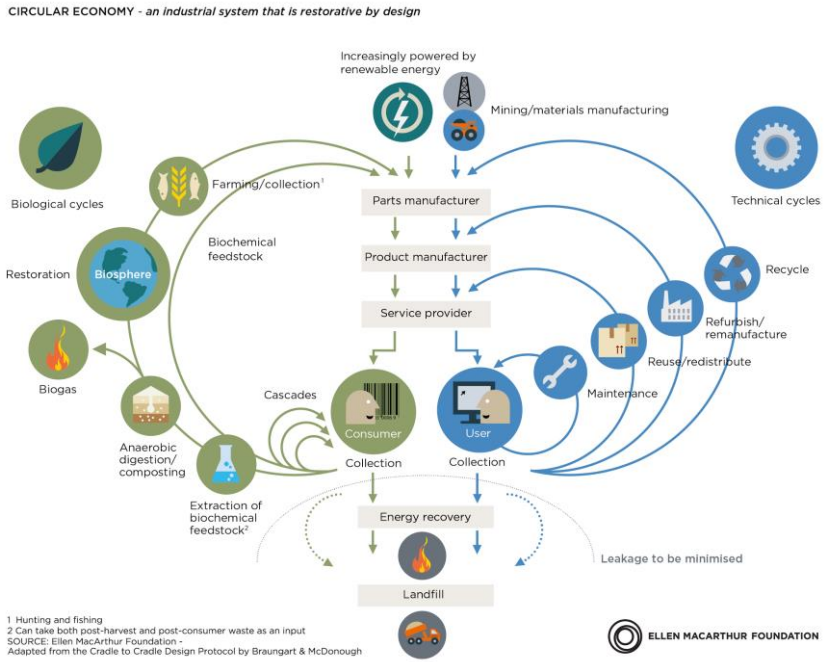
Some basics …



Circular economy should be seen as an instrument for strengthening resilience and strategic autonomy - delivering decoupling of economic growth from resource use and environmental impacts in practice, as well as a part of the bigger picture of economic, societal and cultural transformation needed to deliver the EGD and SDGs

The first dimension is often overlooked…

Resource Efficiency

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***

Often overlooked, but crucial for effectiveness

From Product Maximisation to Providing Human Needs

It is not not about owing it is about using

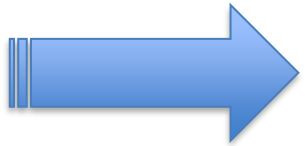
We do not need cars	*…*	*We need mobility*
We do not need light bulbs	*…*	*We need light*
We do not need chairs	*…*	*We need to sit*
We do not need refrigerators	*…*	*We need chilled and healthy food*
We do not need CDs	*…*	*We want to listen to the music*
We do not need pesticides	*…*	*We want healthy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

Dematerialisation, Rethinking Ownership, Efficiency should be Complemented with Sufficiency

From Selling Refrigerator to Selling the Service of Cooling

Dematerialisation and Decoupling

Amazon.com



Wallpapers.vista

Refrigerators sold to the consumer are the basis for producers' profit

Selling food and drink cooling service Refrigerators used are producers' cost

Making EGD Implementable

Internally and Globally

The System Change Compass:
Implementation of the European green Deal vision

- ***Sets zero net emissions*** *of GHG by* ***2050*** *and* ***decoupling of growth and resource use***
- *Acknowledges need for fair and* ***just transition***
- *Aims at* ***strongly interlinked and mutually reinforcing*** *policy recommendations*

- ***Does not sufficiently address drivers and pressures*** *that cause environmental damage*
- ***Does not offer systemic perspective*** *to guide decision-making*
- *Implementation is put at extra risk due to* ***COVID-19 recovery and war in Ukraine***

- ***Maps and envisions*** *the system in service of people and planet*
- ***Derives system level orientations*** *towards desired state*
- *Charts pathway towards prosperity and wellbeing* ***within planetary boundaries***

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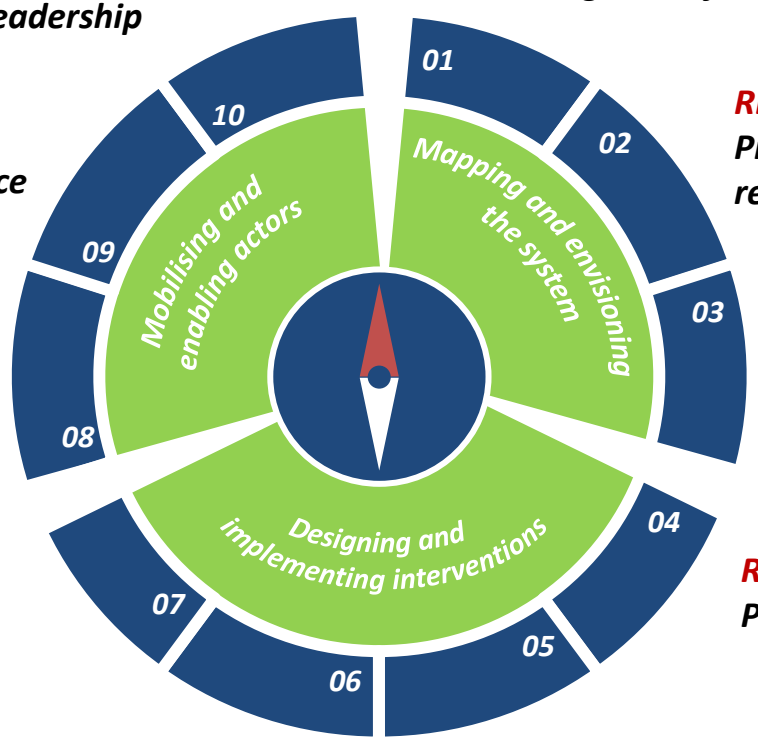
Redefining the Socio-Economic System

REDEFINING LEADERSHIP:
Intergenerational agreement through new forms of leadership

REDEFINING PROSPERITY:
Embracing social fairness for real prosperity

REDEFINING GOVERNANCE:
A systematic approach to governance influenced by science

REDEFINING NATURAL RESOURCE USE:
Prosperity decoupled from natural resource use



REDEFINING FINANCE:
The facilitator of the transition

REDEFINING PROGRESS:
Meeting societal needs as a purpose of a model based on economic ecosystems

REDEFINING METRICS:
Performance measurement updated

REDEFINING CONSUMPTION:
From owning to using

REDEFINING INCENTIVES:
Show the real value of social and natural capital

REDEFINING COMPETITIVENESS:
Digitization and smart prosperity at the heart of European competitiveness

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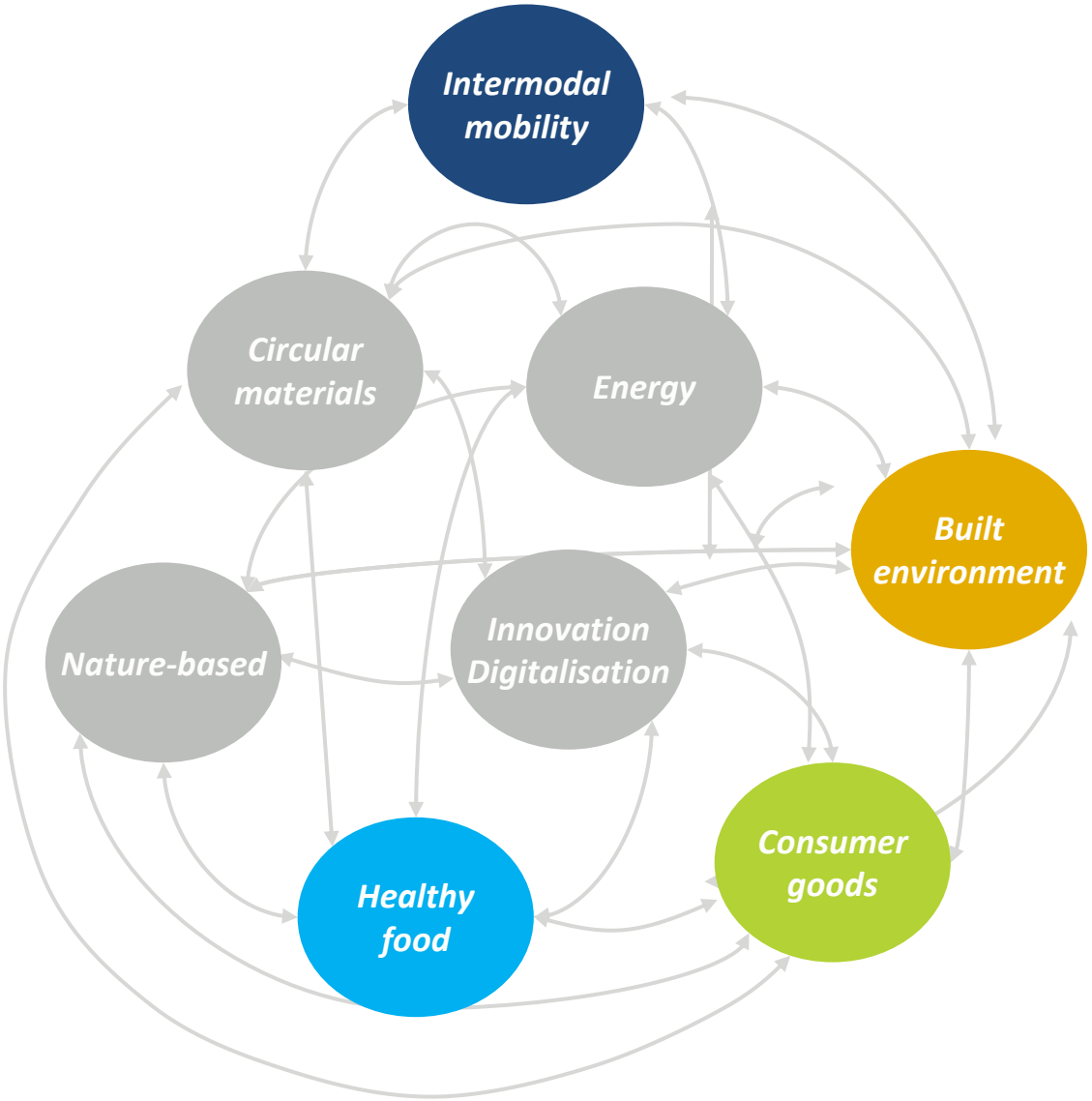
Provisioning Systems



Related to resource intensive human needs

- *Nutrition*
- *Mobility*
- *Housing*
- *Daily functional needs*

- *Resource relevant systems enabling and supporting the provisioning systems delivering societal needs*

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50+ nascent industrial investment opportunities that should be supported to build ecosystems based on compass orientations

Healthy food

- Organic food and beverages
- Regenerative agriculture
- Sustainable aquaculture and fishing
- Reduce and valorise food waste
- Urban agriculture
- Product reformulation for nutritious food
- Alternative proteins

Built Environment

- Smart urban planning
- Rethink built environment ownership
- Repurpose underutilized buildings
- Retrofit existing buildings
- Fluid and sufficiency-oriented space management
- Circular and net-zero housing

Intermodal Mobility

- Fast charging infrastructure
- High-speed railway infrastructure
- Modern and adapted transit infrastructure
- Car- and ride-sharing models
- End-of-life management for cars
- Electric and autonomous vehicles
- Infrastructure to improve traffic flow and AV adoption
- Green aviation
- Green shipping
- Walking/cycling infrastructure

Consumer goods

- Product-as-a-Service models
- Maintenance and value retention in products
- Peer-to-peer product sharing platforms

Nature-based

- Restoration of degraded land and coasts
- Smart forest management
- Urban greening
- Systems for paid ecosystem services
- Seaweed
- Marine and land-based environmental protection areas
- Ecotourism

Energy

- Renewable power generation
- Energy storage
- Hydrogen economy
- Smart metering and (point-of-use) energy management
- Grid integration and technologies
- Production of low-carbon gaseous and liquid fuels (transition technology only)
- Carbon capture infrastructure (transition technology only)

Circular Materials

- Localised and distributed value chain systems
- Asset recovery systems and reverse logistics
- Markets for secondary materials
- High-value material recycling
- Materials-as-a-Service models
- New materials and high-performing substitutes
- Additive manufacturing

Information and processing

- Distributed manufacturing
- High-speed digital infrastructure
- Digital material information and tracking systems
- Data generation, processing, and protection
- Artificial Intelligence for societal challenges

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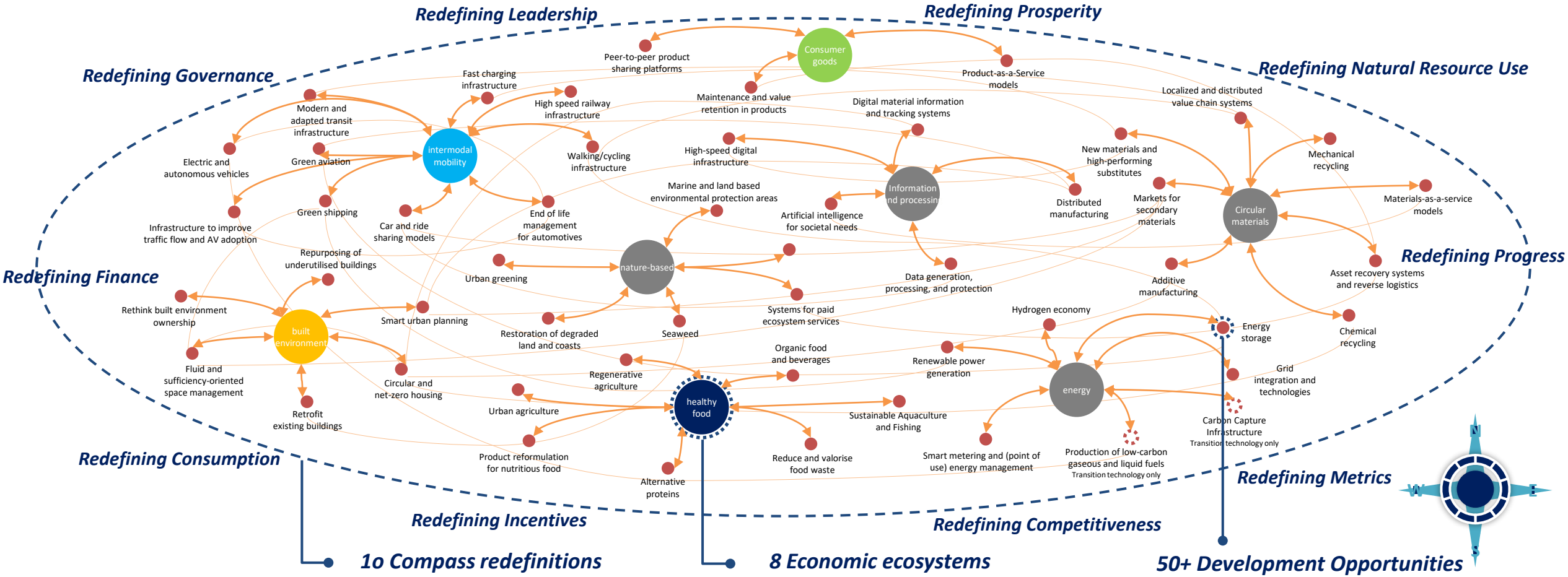
System Change Compass



1o Compass redefinitions | **8 Economic ecosystems** | **50+ Development Opportunities**

New organization of economic activities	*One overarching system that consolidates the European economy in its entirety.*	*Economic ecosystems can meet a specific societal need (e.g. intermodal mobility system) or support the fulfilment of multiple societal needs (e.g. new energy system).*	*"Champions" are economic subsystems which could become the new spearheads of the green, resilient and fair post-COVID economy Europe wants to build*
Application of the compass on each level	***10*3 = 30 system-level policy orientations***	***3-5 specific economic ecosystem policy orientations***	***50+ economic subecosystems orientations***

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Main Blind-Spots

Climate Change in Focus

1

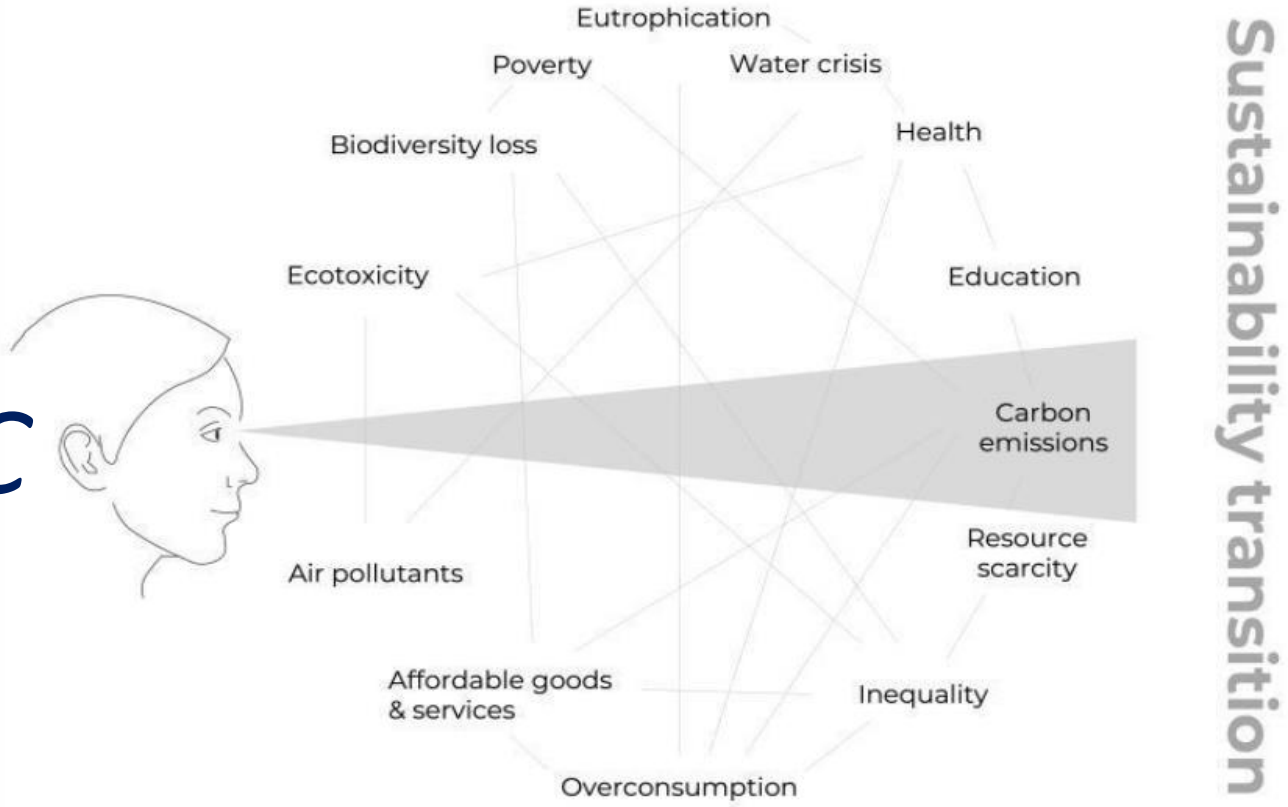
Lack of Holistic System approach

Public leaders 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

Hans … Systems literacy& Systemic Policies

We need to extend the optic and potential policy options beyond the currently prevailing energy supply

UNFCCC



This leads to trade-offs and future lock-ins rather then to synergies and potential multiple-benefits ➢ and resilient economy and society

A 'Glasgow Breakthrough' was announced on road transport aiming for zero emission vehicles to be the new normal, accessible, affordable, and sustainable in all regions by 2030.

UN CLIMATE CHANGE CONFERENCE UK 2021

IN PARTNERSHIP WITH ITALY

System change in road transport means less and more efficient traffic, for more value

Five Levers for Sustainable Car-Based Transport

Reduce demand for car-based transport

- ***Reduce*** *overall* ***mobility need*** *(e.g., through remote work)*
- ***Modal shift*** *from cars to foot, bike, & public transport*
- ***Higher utilization of vehicles*** *through sharing*

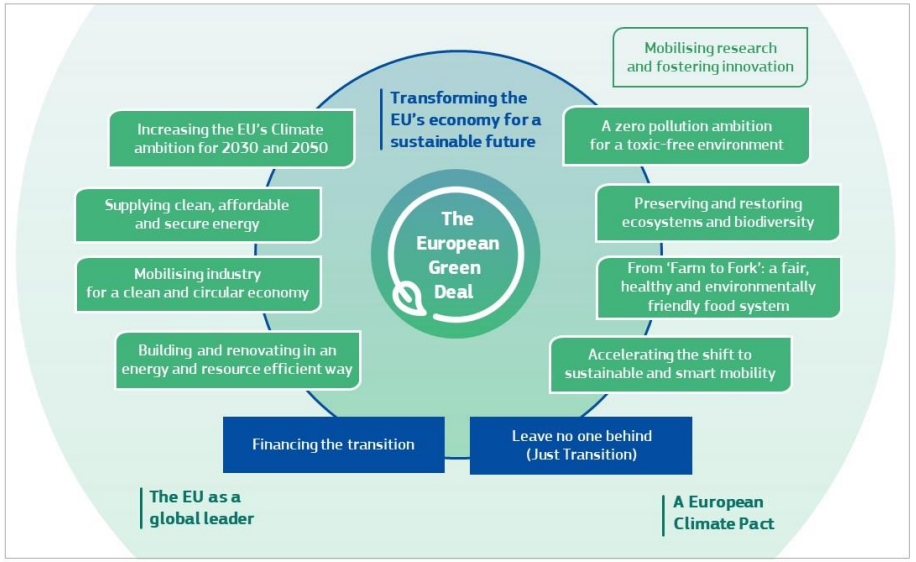
Ensuring remaining vehicles are as sustainable as possible

- ***Electrification*** *based on renewable energy*
- ***Circularity****, maximizing value of used materials*

2

Lack of Drivers and Pressures Perspective

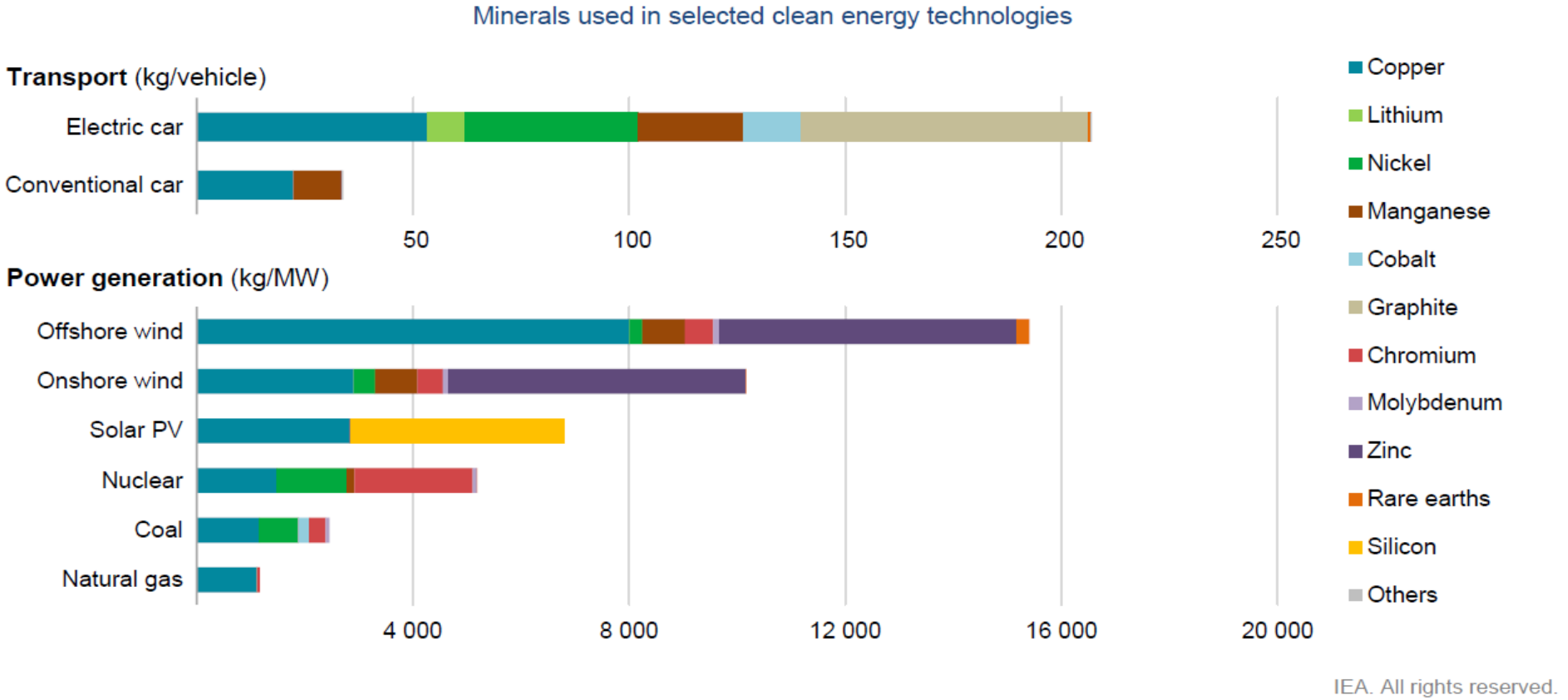
Policy attention does not focus on the roots of the problem and address the drivers and pressures. It lack focus on natural resource use and management, as well as on market signals leading consumers and producers' behaviour.



It is "a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are: no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use … At the same time, this transition must be just and inclusive"

Energy Transition

Choice of minerals



Notes: kg = kilogramme; MW = megawatt. Steel and aluminium not included. See Chapter 1 and Annex for details on the assumptions and methodologies.

We are replacing fossil with mineral energy supply

Source: Financing Minerals Extraction for Sustainable Development – IRP report in development to be released by end 2023

Energy transition is resource demanding on the energy supply side and on the energy demand side

- *Reaching net zero by 2050 will require about six times today's critical mineral use in 2040. And even meeting today's under-ambitious national climate plans would require more than doubling of critical minerals we are using today.*
- *Electric vehicles use close to ten times the material of conventional cars – using at least eight different critical material types, compared to just three for conventional cars.*

Protecting the environment by improving circularity and sustainability of critical raw materials

- *MS to adopt and implement national measures to improve the collection of critical raw materials rich waste and ensure its recycling into secondary critical raw materials.*
- *MS and private operators to investigate the potential for recovery of critical raw materials from extractive waste in current mining activities but also from historical mining waste sites.*
- *Products containing permanent magnets will need to meet circularity requirements and provide information on the recyclability and recycled content.*

Conclusion: CRM Act stays within the supply and recycling logic and does not address the full potential of circular economy opportunities (design, business models …). The need for demand reduction might emerge from benchmarks set due to insufficient renewable energy availability. It will have important, but limited impact on effectively managing EU economic fragility. But focusing on waste is a wasted opportunity!

3

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.

- *To unpack the standstill in our climate efforts and make them effective, to start closing the existing gap among high-income and low-income countries, we must stop ignoring the inherent wastefulness of our production and consumption systems, in particular in high-income countries. For example, it would be in vain to decarbonize the production of steel, as important as this is, if it is used to produce under-used cars and houses, which contribute to traffic and property market bubbles, but not to real social prosperity.*
- *Efficiency policies should be complimented by sufficiency policies. We should start looking how to integrate material and consumption footprints in NDC's structure and logic.*

- *Loss and Damage agreement was considered as the mayor success of the COP27. It is fair and needed. It is not limiting the warming and contributing to the solution of the climate problem, but it is and important acknowledgement from high-income countries about their responsibility for the current situation.*
- *It hopefully creates conditions to collectively move to the real drivers of climate change. To address the problems, linked to current economic system, with benefits favouring minority, favouring us here and now, and dangerous and damaging for our own collective future, even survival.*

- *Standards and behaviour patterns linked to the current economic model were set by high-income countries. We are ethically bound to show the world, that we are willing and able to change a reality we created, and to lead the essential transition – at home and globally. While the responsibility for the past is clear, responsibility for future is joined and common - cooperation is the magic ingredient for success.*
- *But only by leading that transition, only by looking first in the mirror, we would give nobody an excuse to repeat some of the mistakes done in the past and avoid collective failure.*

***To summarise**: For The Future We Want we must enter the untapped territories of the needed deep system transformation*

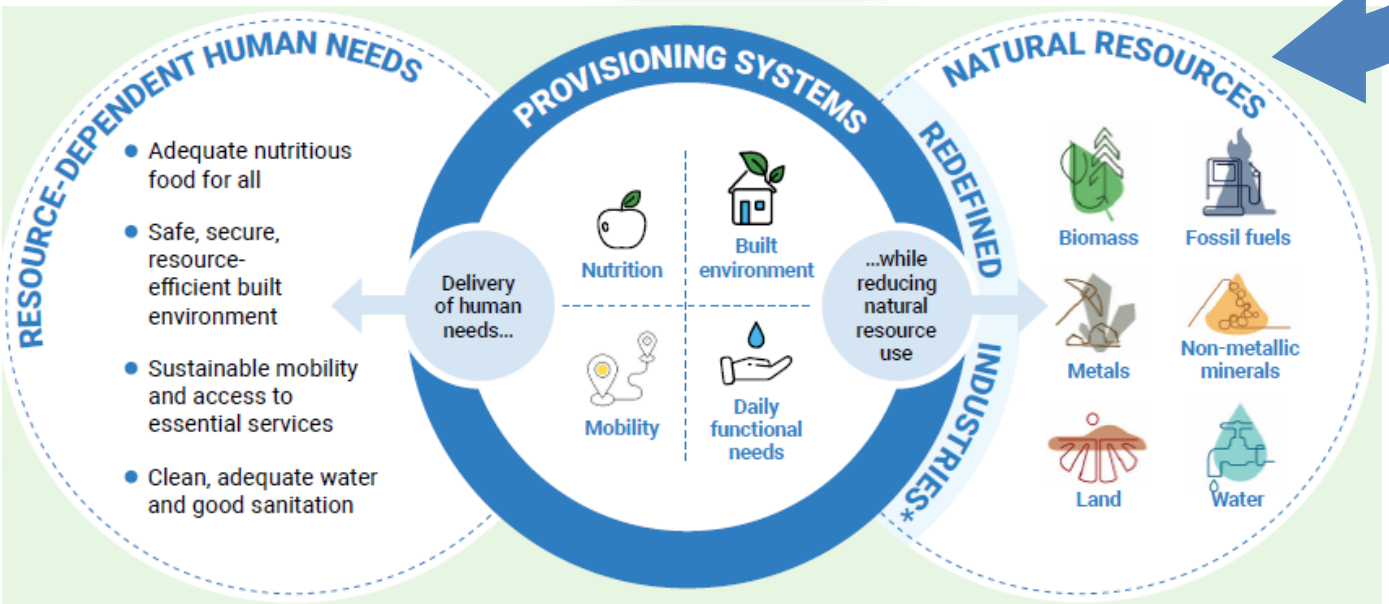
If we want to avoid extinction of elephants in nature, we must extinct elephants in the rooms

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

Next Flagship Report: Global Resources Outlook 2024

GRO24 will…

- ✓ ***Centralize System Change logic**, building directly on GRO19 and System Change Compass*
- ✓ ***Assess past, present, and future resource** use through the lens of **human needs***
- ✓ *Compare the **gap between current plans** and the **transition we need***
- ✓ *Give **time-bound policy recommendations**, aligning **short and long-term interests***



To Conclude

Science is Clear, Change is Unavoidable and so are some Basic Logical Shifts

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

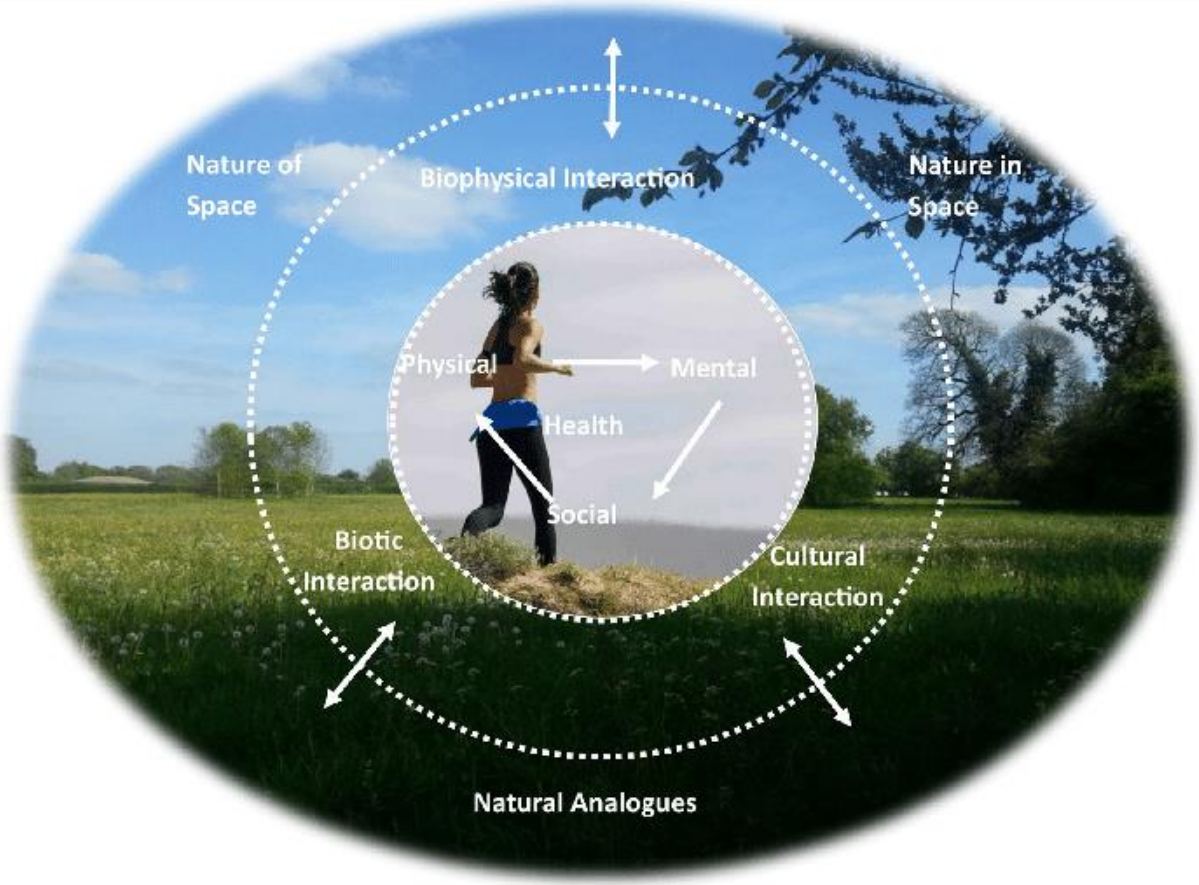
https://edistaffing.com

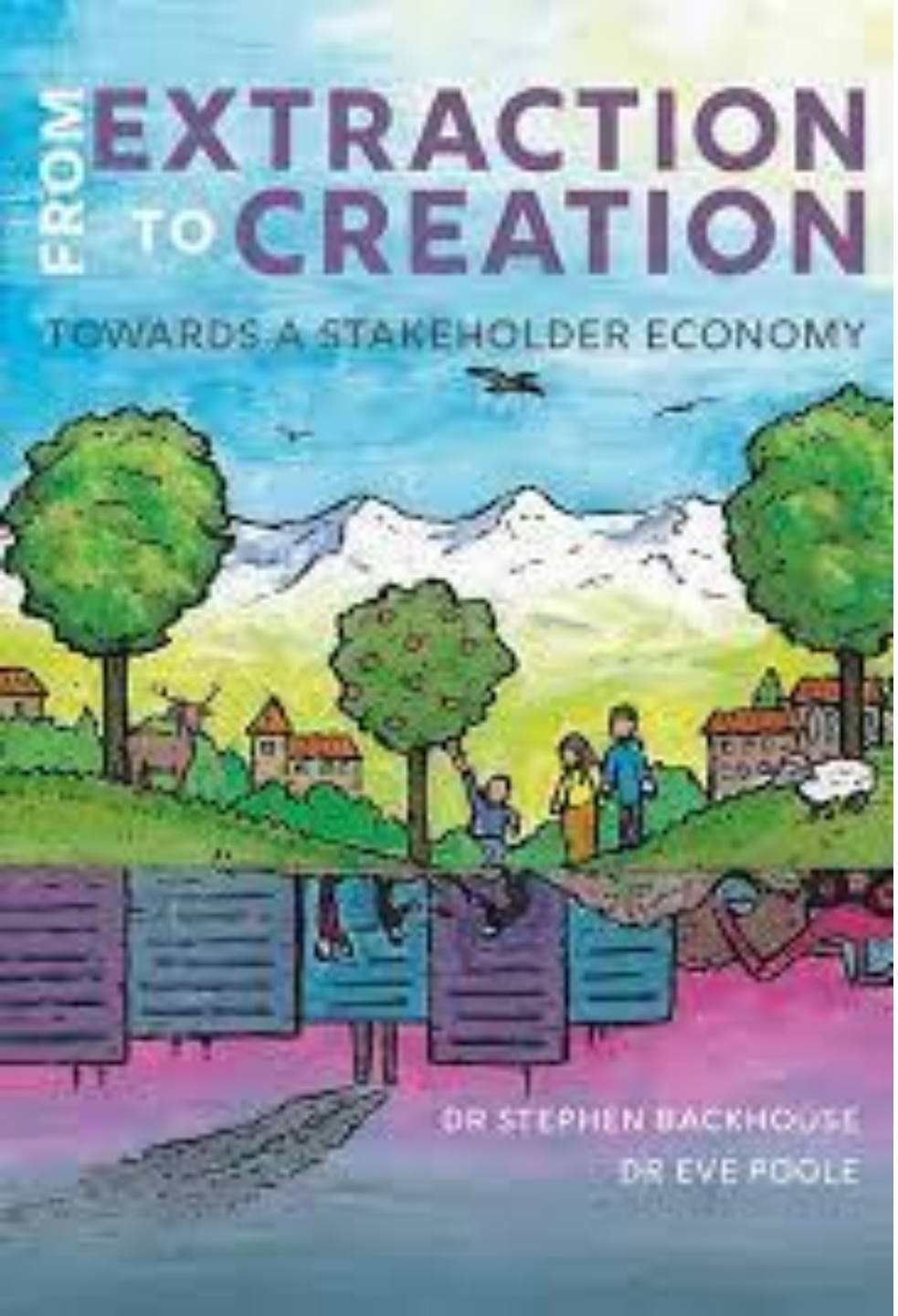
From Humans in function of economic success and development to an economy in function of delivering human needs

We must set the order right!

From economy considering Humans as external/superior to Nature
to an economy acknowledging that we are embedded with Nature

Destroying Nature is destroying ourselves!





From extraction-based production to a creation-based production

We should stop stimulating extraction based economic success and reward responsible, innovative, creative ways of meeting human needs

From an egoistic, short-term based interests' governance structures and logic to cooperation and sharing sovereignty.

We must improve our collective resilience. We need a well-designed intergenerational pact.

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Access to and use of natural resources have been in the human history

closely related to the level of the achieved wellbeing, but also to stability, security, conflicts, wars

Land, Water, Oil and Gas, Minerals, Precious Metals …

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Global Risks Report 2023

Top 10 Risks

WORLD ECONOMIC FORUM

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

Source: World Economic Forum, Global Risks Perception Survey 2022-2023

It is getting green !!!
Taking pain-killers to remove the acute pain
do not heal chronical diseases …
rather hides them and make them worse

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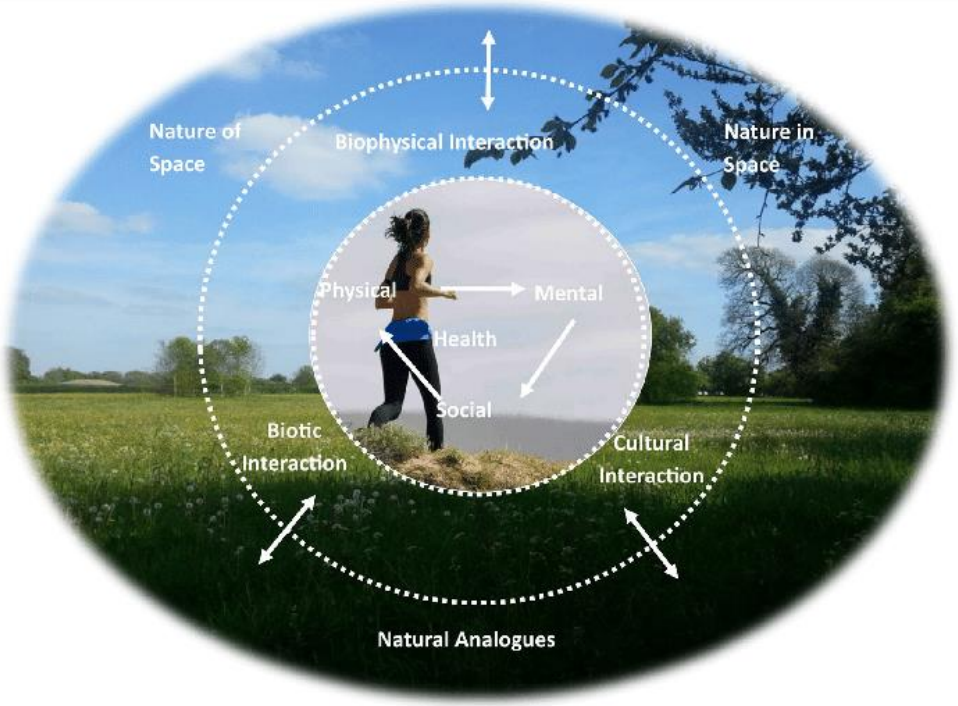
The lessons learned recently are more than convincing to understood that changing our relationship with nature, is ultimately an economic, security and resilience imperative … central also to fairness and equity

This relationship is not stable, nor balanced, and it will be resolved either with collective wisdom and effort, or in a hard and very painful way (conflicts, hunger, pandemics, migration …)

Put the current challenges in the strategic context, broaden and strengthen the front of stakeholders for change!



European Commission should continue to play active role in CE related efforts internally as well as internationally

- *EGD follow up should integrate a system change based circularity vision as an economic, security and equity imperative leading to resilient world*
- *For all EC activities is important to keep consistency among all DGs efforts and funding instruments, including INTPA and NEAR*
- *UNEP International Resource Panel should serve as a scientific decoupling/circular economy backbone and main knowledge provider*
- *We must improve international cooperation and governance. GACERE is a good example of international CE diplomacy with active EC role, which could potentially lead to a broader, even global circularity cooperation efforts.*

Circularity is not a new concept …

It is the oldest concept on the planet Earth.

Nature is a "bio-economy" based on the principles of the circularity. Nothing is lost and everything has its purpose.

So, for the beginning we would need to answer only one question:

Do we agree that we humans are part of the nature too?

To answer this question, we probably do not need the help of the most famous Belgium detective, but his advice is always useful

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!