

INNOVATION FUND

Driving clean innovative technologies towards the market

Circular Economy and Climate Change Mitigation

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Let's start the story in my home country Slovenia

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.”*

THE TASTE OF “UTTER CHAOS”

- *Population* growth (2050 – 9.7 billion)
- Few people own the same as the poorest half of the world and the richest 1% is more *wealthy* than the rest of the world
- We *throw away* one third of the *food* we produce
- *More than 50% of urban fabric* expected to exist by 2050 still needs to be constructed. 2011-13 *China* has used more *cement* than *USA* in 20th century
- *Climate change* experts warned us that emissions need to be about halved by 2030 to limit warming to 1.5°C
- *Biodiversity*: Living Planet Index – 60% fall in just 40 years. Biomass of the mammals living in the nature has been reduced in recent decades for 82%
- A million of *plastic* bottles are bought every minute (9% of plastic recycled, 12% incinerated, 79% landfills or environment). If drinking only *bottled water* one consumes 130,000 *plastic particles* per year from that source alone, compared to 4,000 from tap water
- We are the first generation more likely to die as a result of *lifestyle choices* than infectious disease



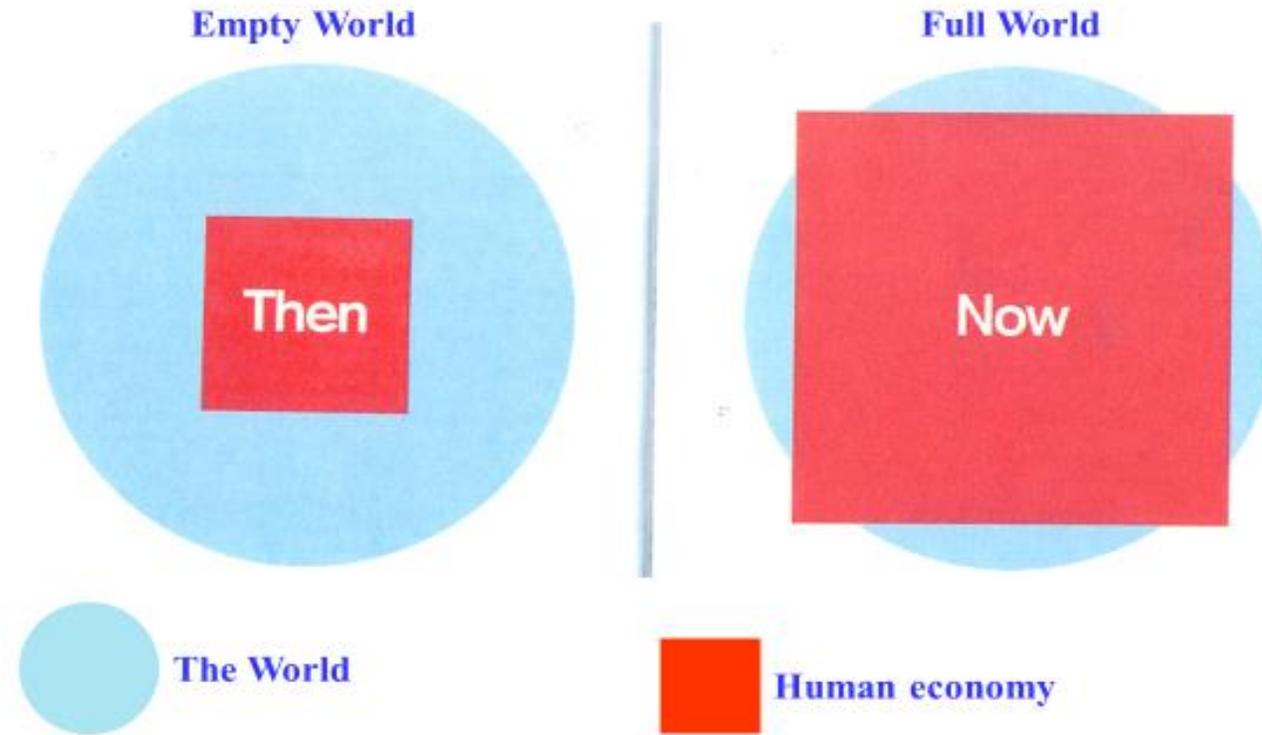


*For the first time in a human history we face the emergence of a single, tightly coupled human **social-ecological system of planetary scope.***

*We are more **interconnected** and **interdependent** than ever.*

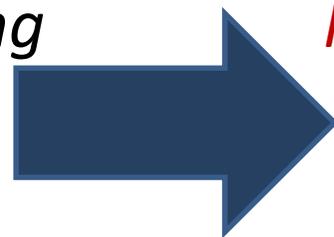
*Our individual and collective **responsibility** has enormously increased.*

Empty World and Full World

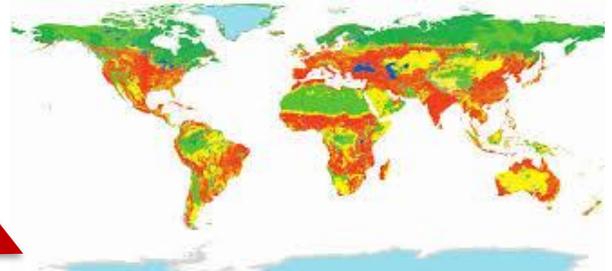
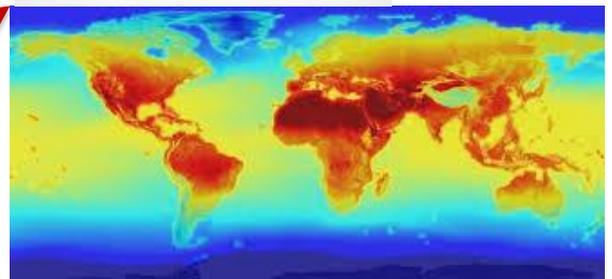
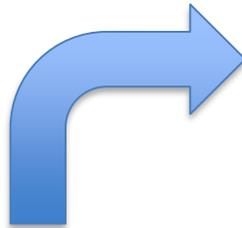


Source: Club of Rome: Simplified after Herman Daly

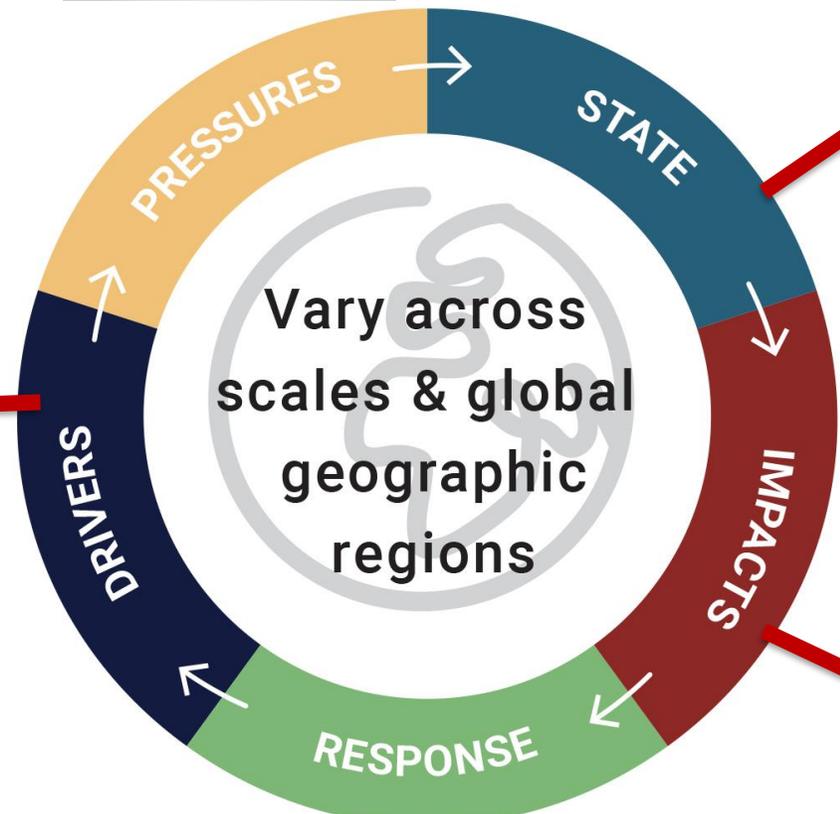
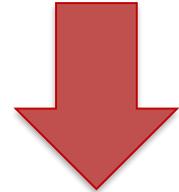
Labour and Infrastructure limiting factors of human wellbeing



Natural resources and Environmental sinks limiting factors of human wellbeing

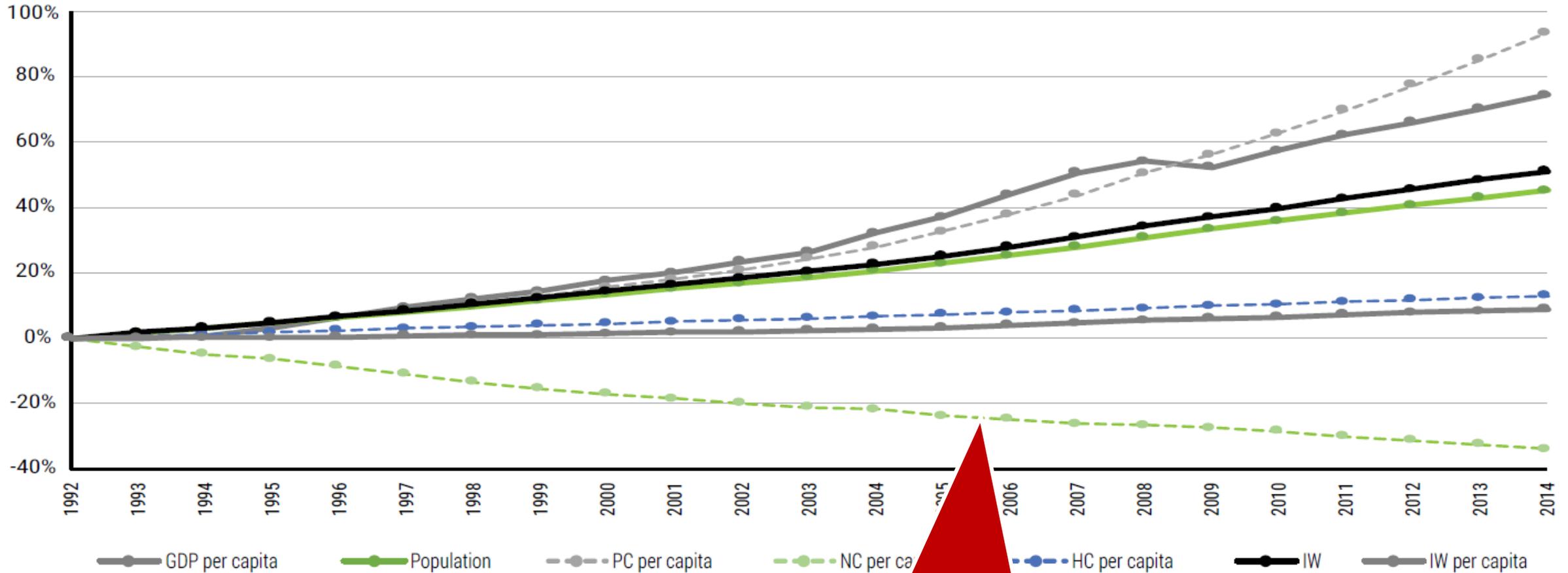


Our Economy



Inclusive Wealth (IW) Index (and its components) evolution - 1992 to 2014

Source: UN, 2018 Inclusive Wealth Report 2018

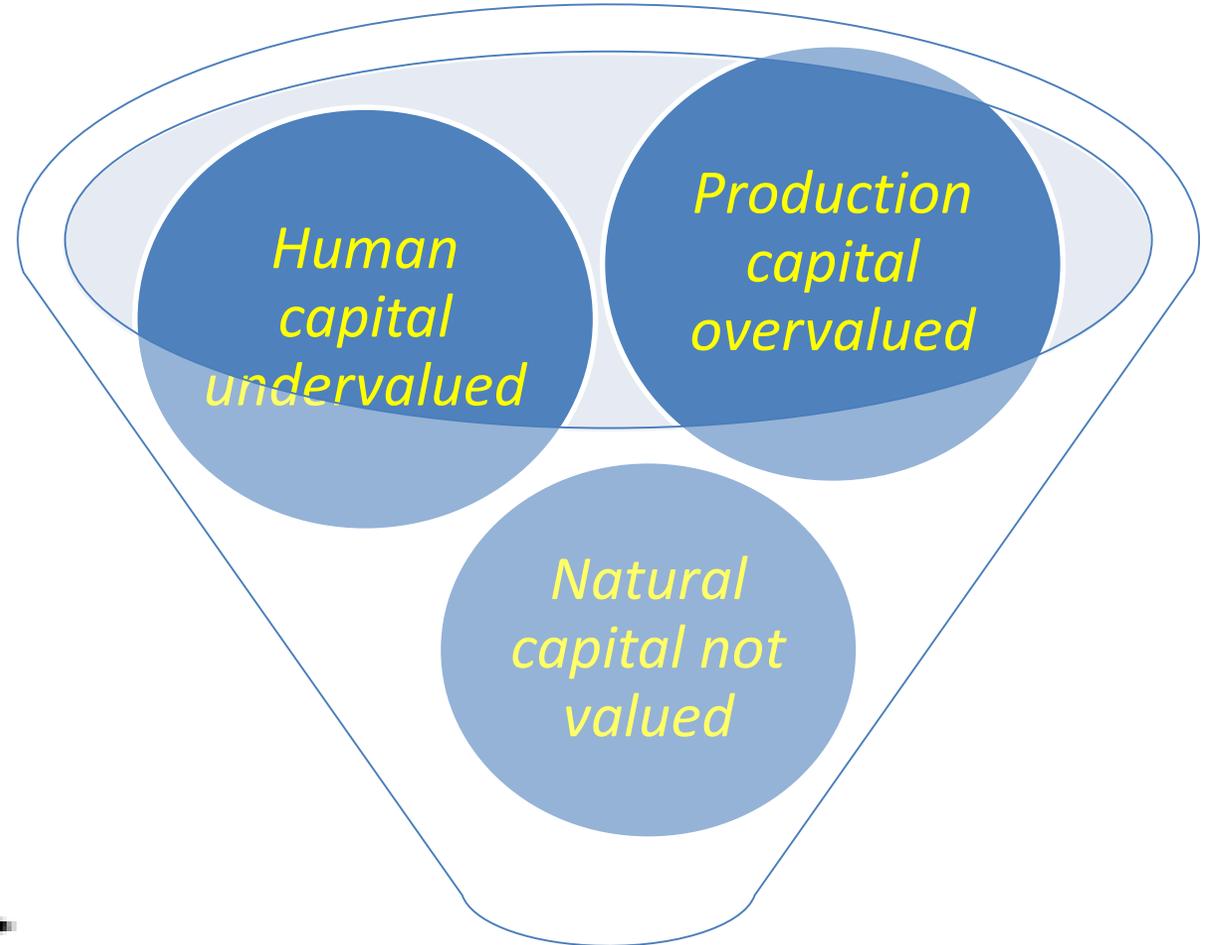
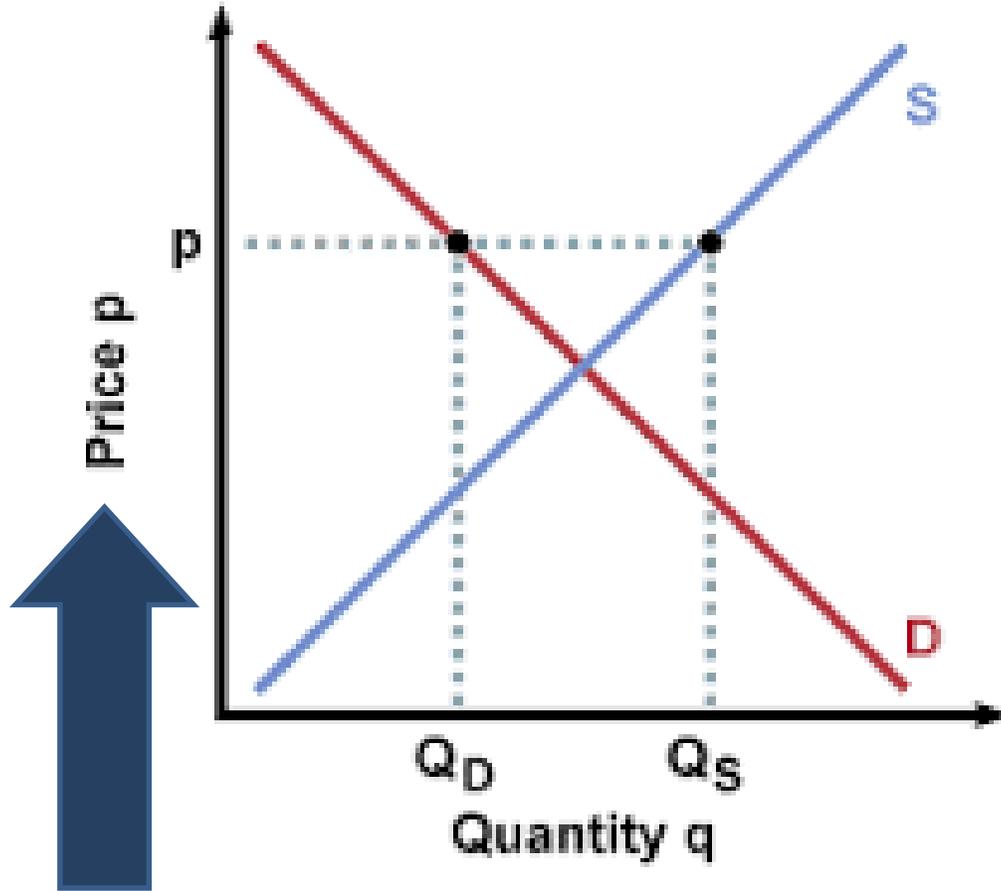


IW – Inclusive Wealth
PC – Production capital
HC – Human capital
NC – Natural capital

Growth of GDP in the past decades has been achieved at the cost of depleting natural capital

*Producers/Consumers
Rational Behaviour*

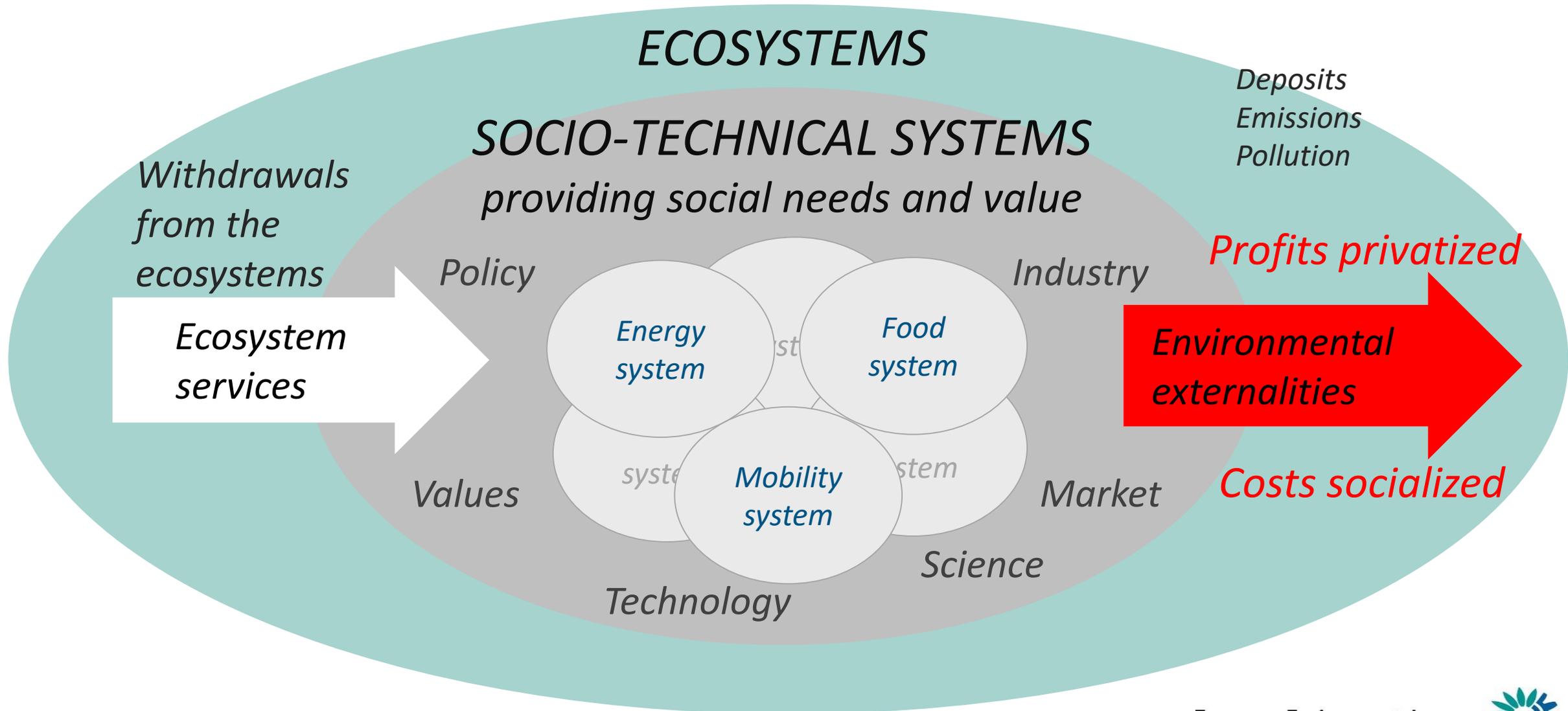
Market Economy



*Economic, social and
environmental (in)balance*

LIVING WELL WITHIN ECOLOGICAL LIMITS

ECONOMIC SYSTEM FUNCTION OF ECOSYSTEM



Resources

The Missing Link

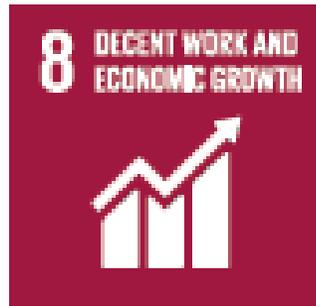


- *Natural Resources have been in the human history **always closely related to stability, conflicts, wars** (land, water, oil, precious minerals ...)*
- *According to the UN IRP, in the mid-term, except in specific cases, resource shortage will not be the core limiting factor of our (economic) development ...*
- ***But the environmental** (climate change, biodiversity loss, pollution ...) **and health consequences caused by excessive and irresponsible use of resources will be!***



International
Resource
Panel

SDGs DIRECTLY DEPENDENT ON NATURAL RESOURCES





International
Resource
Panel



*Trade-offs among various SDGs are unavoidable.
Sustainable Consumption and Production is the most
efficient strategy to mitigate trade-offs and create
synergies to resolve the development and environmental
challenges articulated in the SDGs.*



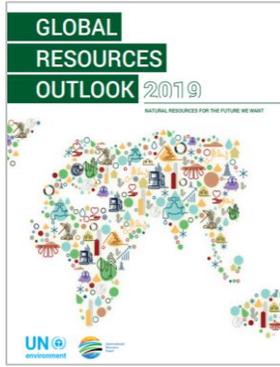
International
Resource
Panel

FOCUS ON SUSTAINABLE PRODUCTION AND CONSUMPTION



Resources:

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



Biomass

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



Fossil fuels

Fossil fuels (coal, gas and oil)



Metals

Metals (such as iron, aluminum and copper...)

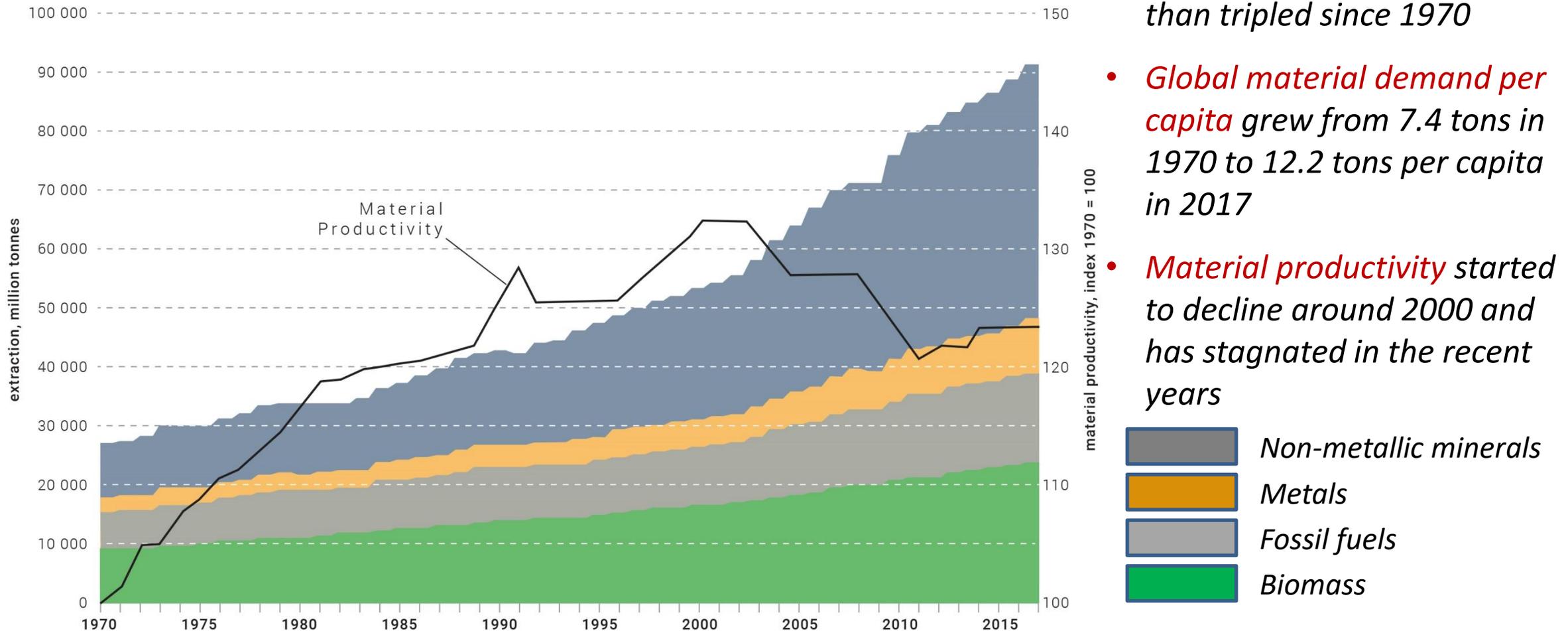


Non-metallic minerals

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

Relentless demand: Global resource use, Material demand per capita and Material productivity

Global material extraction and material productivity, 1970 - 2017



Environmental impacts in the value chain

resource extraction and processing phase

90% of global biodiversity loss and water stress

50% of global climate change impacts

1/3 of air pollution health impacts



Biomass



Metals



Non-metallic minerals



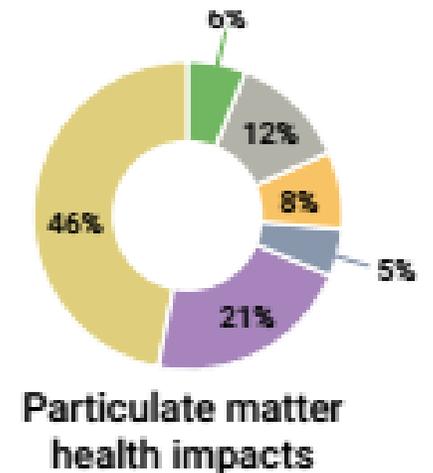
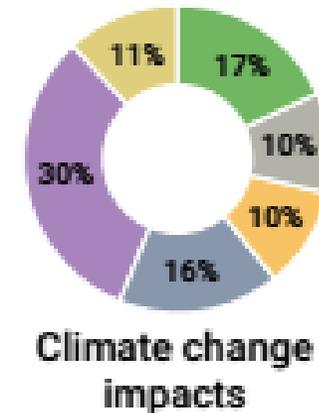
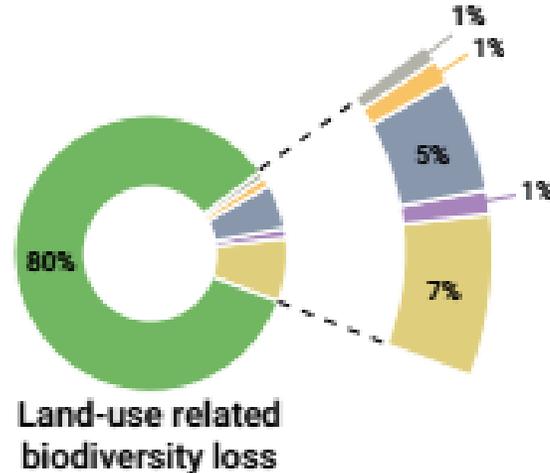
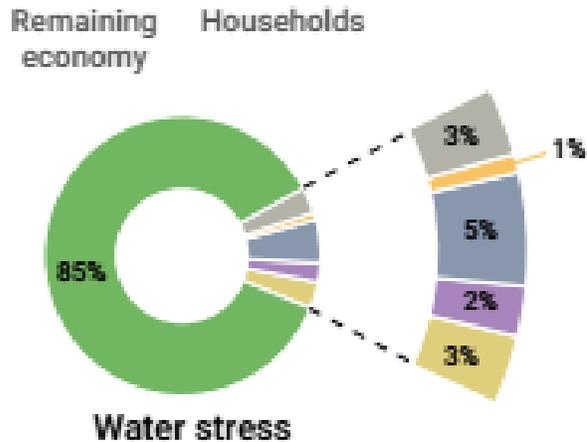
Fossil fuels



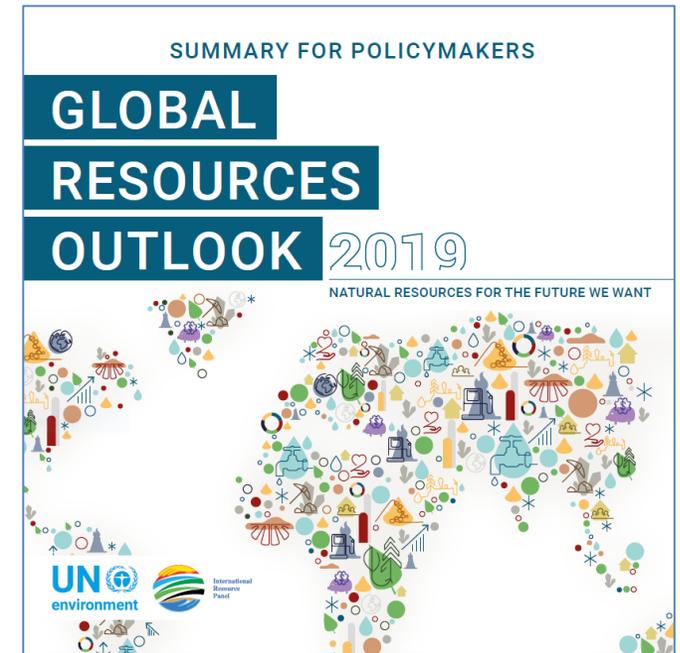
Remaining economy



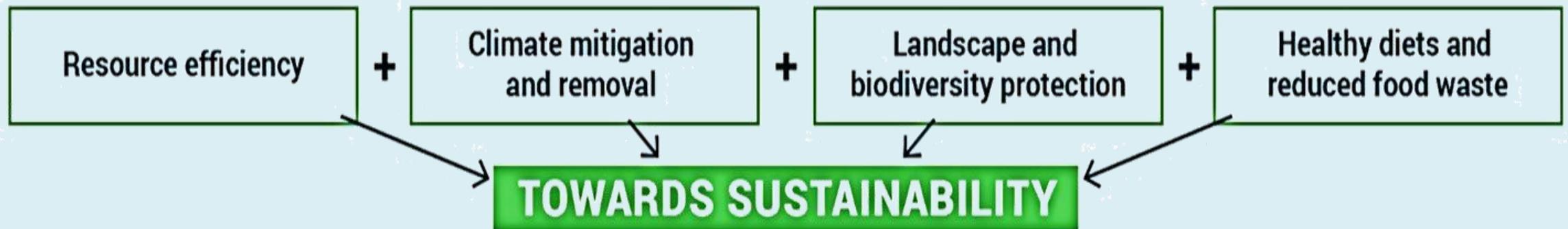
Households



Achieving decoupling is possible and can deliver *substantial social and environmental benefits*, including repair of past environmental damage, while also supporting *economic development and human well-being*

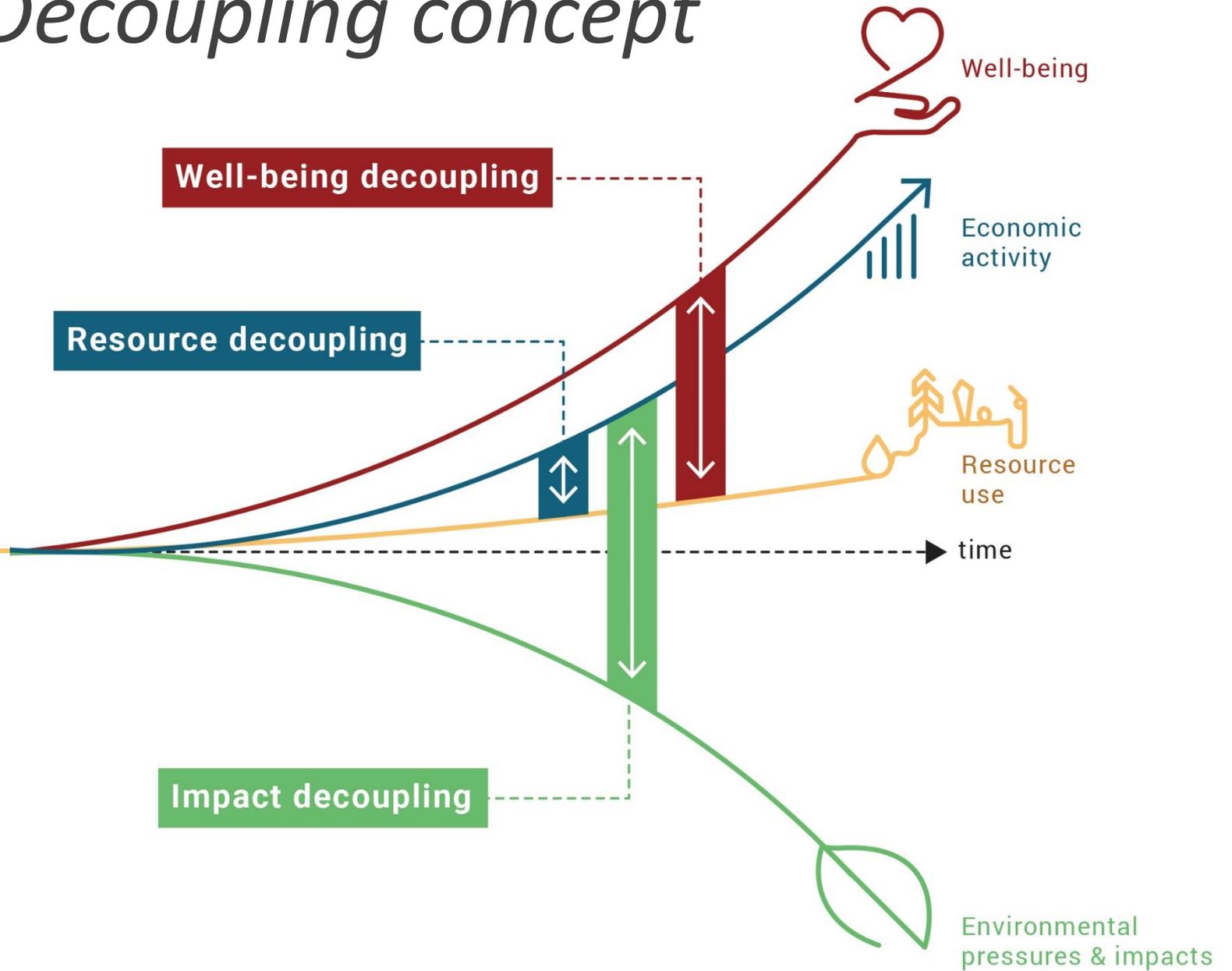


IRP Scenario modelling



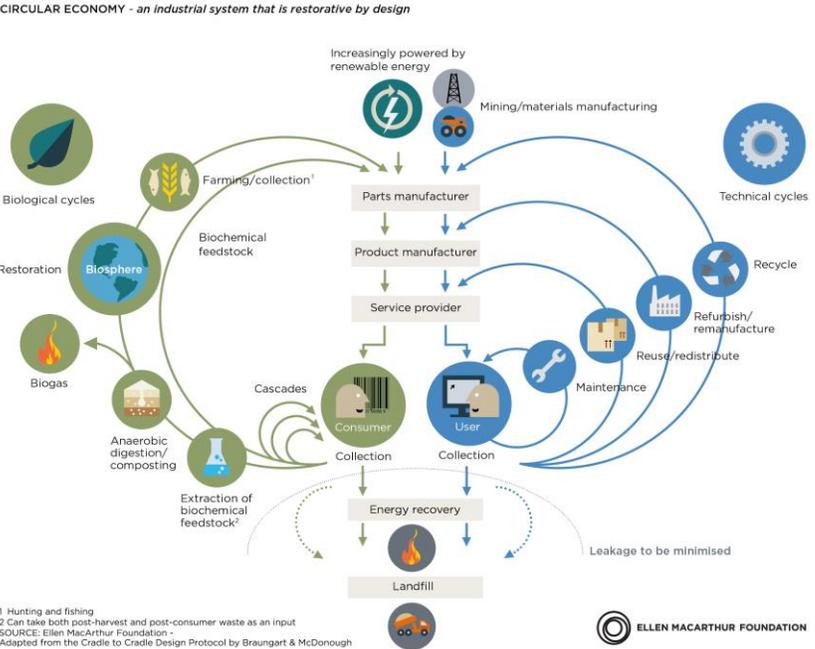
The *Towards Sustainability* scenario shows that changes in policies and behaviors can achieve decoupling of natural resource use and environmental impacts from economic growth and human wellbeing.

Decoupling concept



Green Deal should be built around *Circular Economy*.

Circular Economy should be seen as an *instrument for deliver decoupling* of economic growth from resource use and environmental impacts and as a *part of the bigger picture of economic, societal and cultural transformation* needed to deliver the *SDGs*.



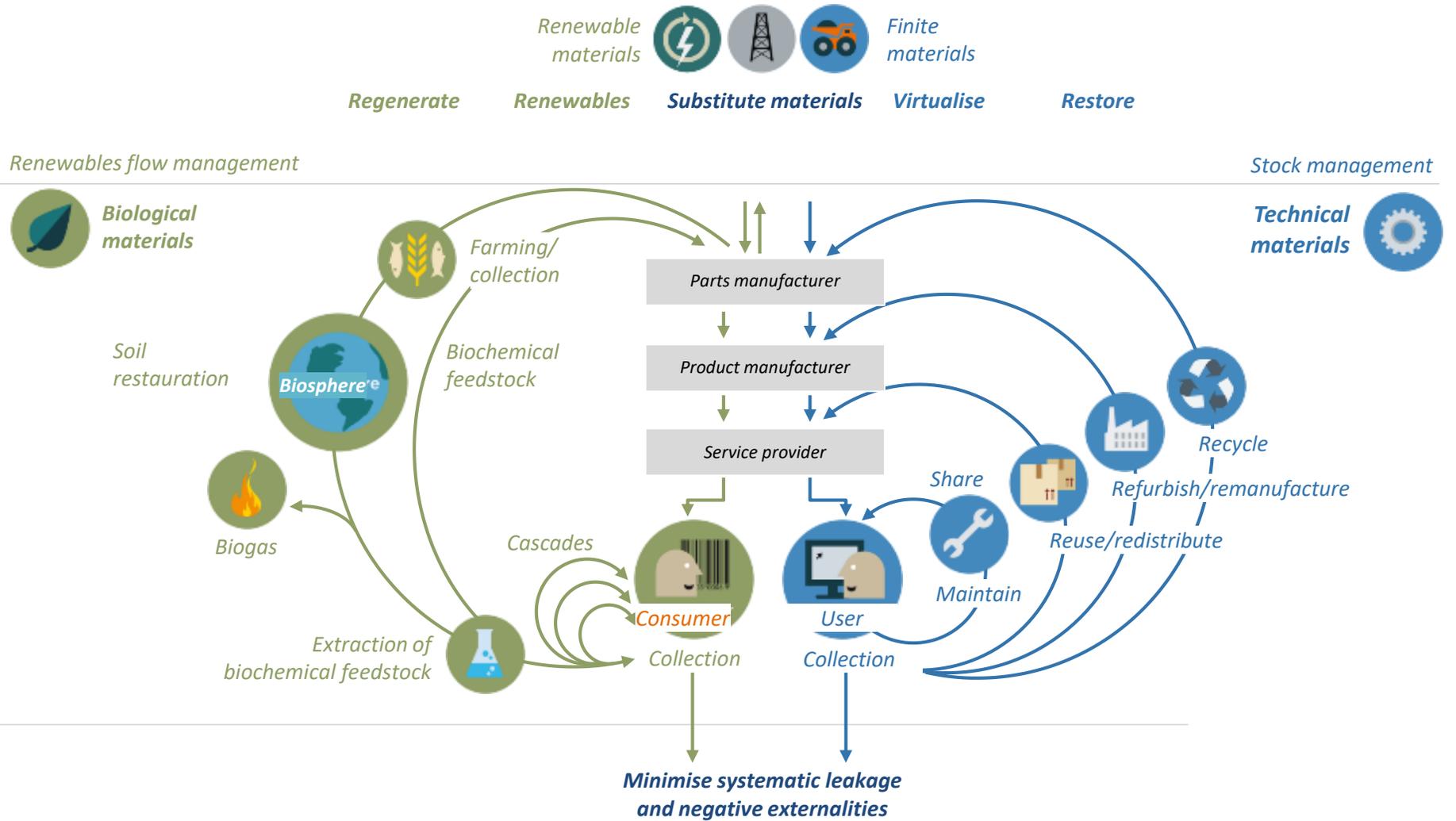
OUTLINE OF A CIRCULAR ECONOMY SYSTEM

Principles

1 Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows

2 Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles

3 Foster system effectiveness by revealing and designing out negative externalities



Source: Ellen MacArthur Foundation; McKinsey Center for Business and Environment; Stiftungsfonds für Umweltökonomie und Nachhaltigkeit;

SUPPLY SIDE SOLUTIONS

CARBON MANAGEMENT

LAND

WATER

ENERGY

MATERIALS

DECOUPLING

DEMAND SIDE SOLUTIONS

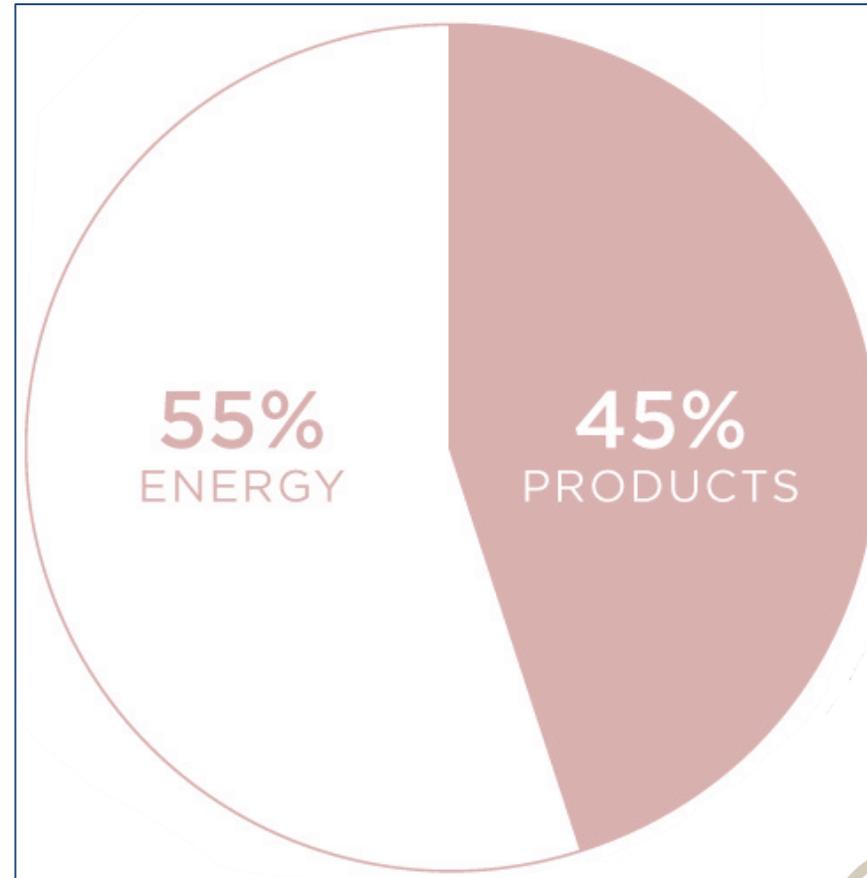
ECO-SYSTEM SERVICES, ENVIRONMENTAL SINKS

NATURE BASED SOLUTIONS

Climate battle: An incomplete picture?

In 2050 a circular scenario for:

- *Passenger cars* could reduce CO2 emissions by **70%**
- The *built environment* could reduce CO2 emissions by **38%**
- *Food* could reduce CO2 emissions by **49%** in 2050



Energy

- *Energy systems*
- *Energy for transportation*
- *Energy for buildings*

Products

- *Agriculture, Forestry, Other Land Use*
- *Industry (material product.)*

TOTAL CURRENT EMISSIONS

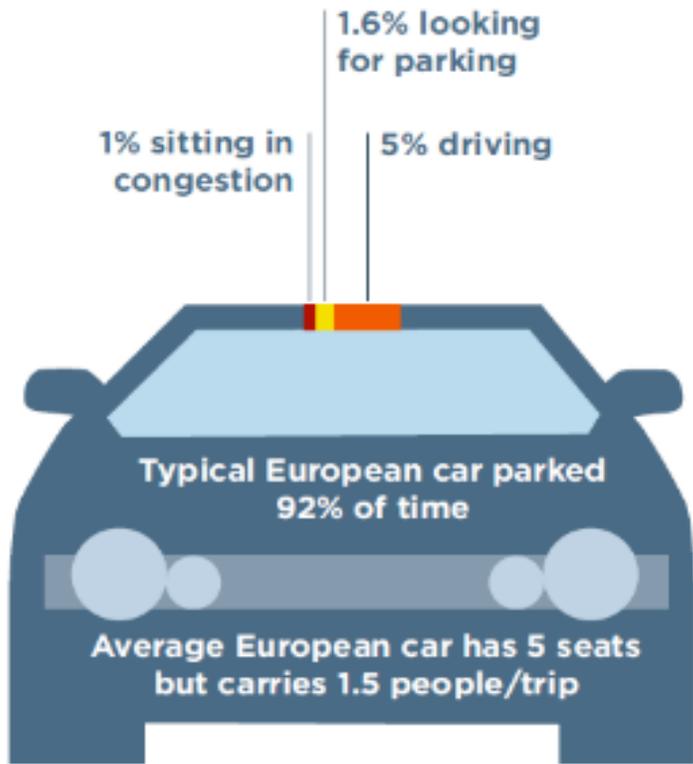


ELLEN
MACARTHUR
FOUNDATION
Rethink the future

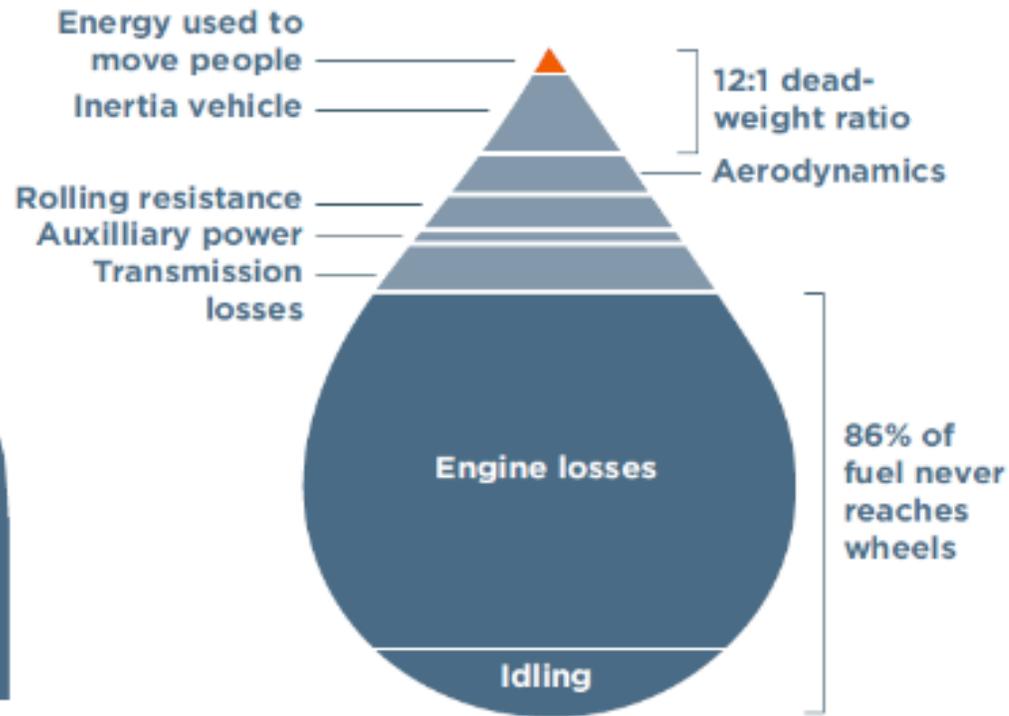
MATERIAL
ECONOMICS

STRUCTURAL WASTE IN A **MOBILITY SYSTEM**

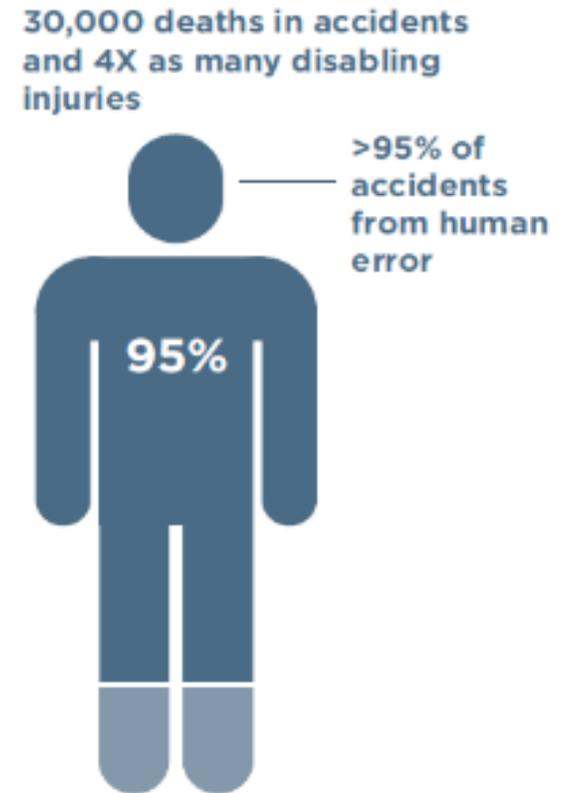
CAR UTILISATION



TANK-TO-WHEEL ENERGY FLOW - PETROL



DEATHS AND INJURIES/ YEAR ON ROAD



LAND UTILISATION:

5%

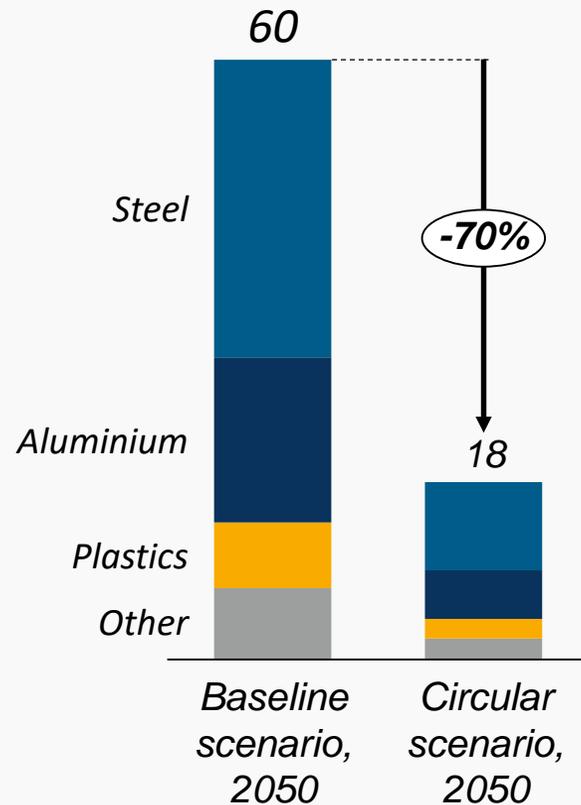
Road reaches peak throughput only 5% of time and only 10% covered with cars then

50%

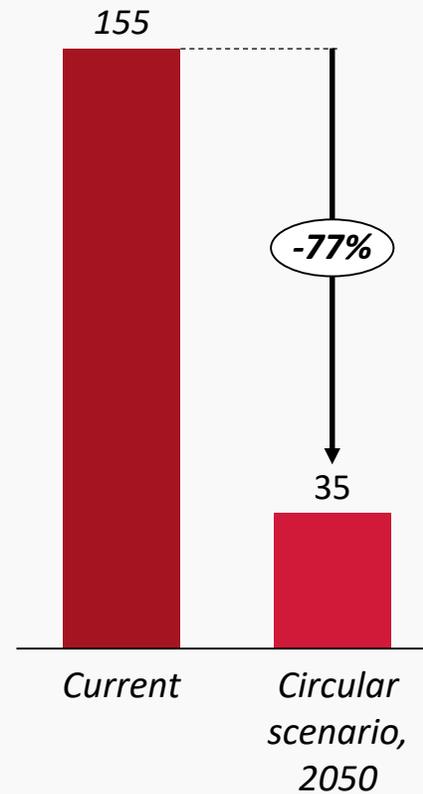
50% of most city land dedicated to streets and roads, parking, service stations, driveways, signals, and traffic signs

A **SHARED MOBILITY** SCENARIO IS A HIGHLY ATTRACTIVE VISION FOR **PASSENGER CARS**

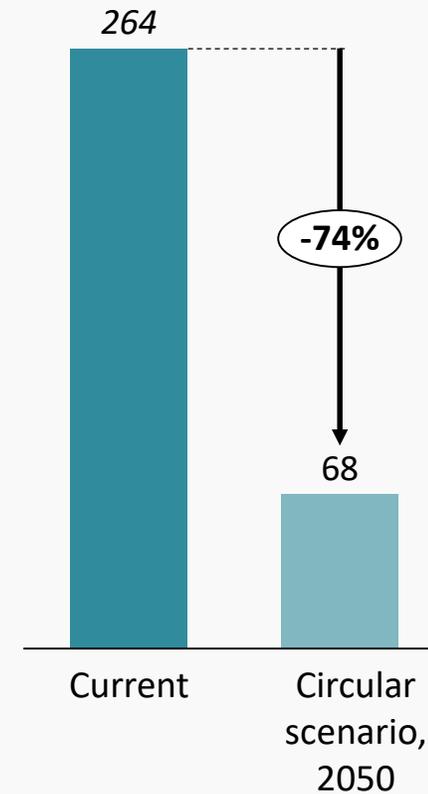
CO₂ impact of materials
Mt CO₂ per year, Europe



Total cost of ownership
EUR per 1000 pkm



Externalities and cost to society
EUR per 1000 pkm



pkm = passenger kilometre

From Quantity Driven Profits to the Consumer's Needs

We do not need cars

We do not need light bulbs

We do not need chairs

We do not need refrigerators

We do not need CDs

We do not need pesticides

...

...

...

...

...

...

We need mobility

We need light

We need to sit

We need chilled and healthy food

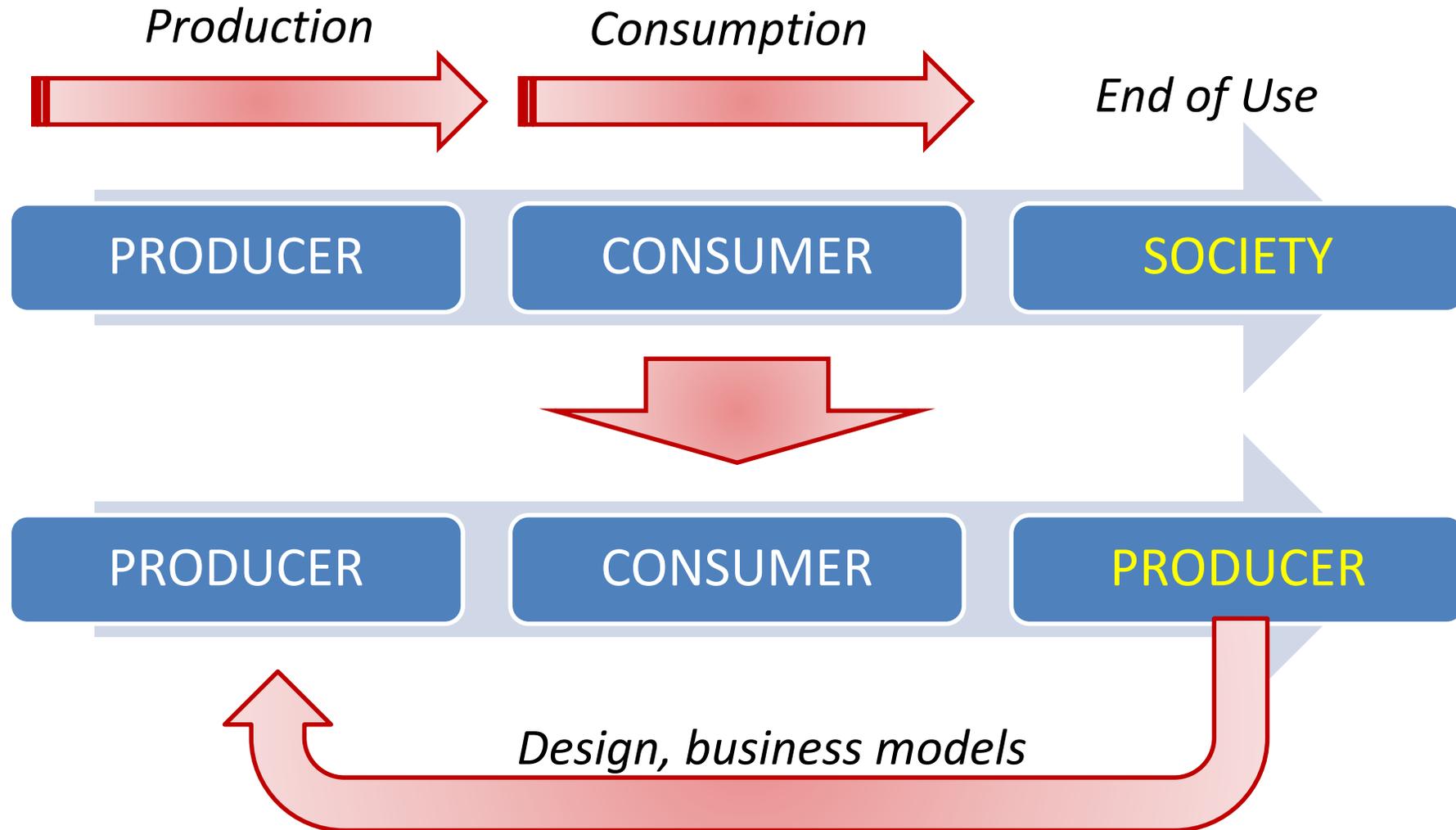
We want to listen to the music

We want healthy plants



Real Extended Producer Responsibility

Better Connecting Producer with his Product



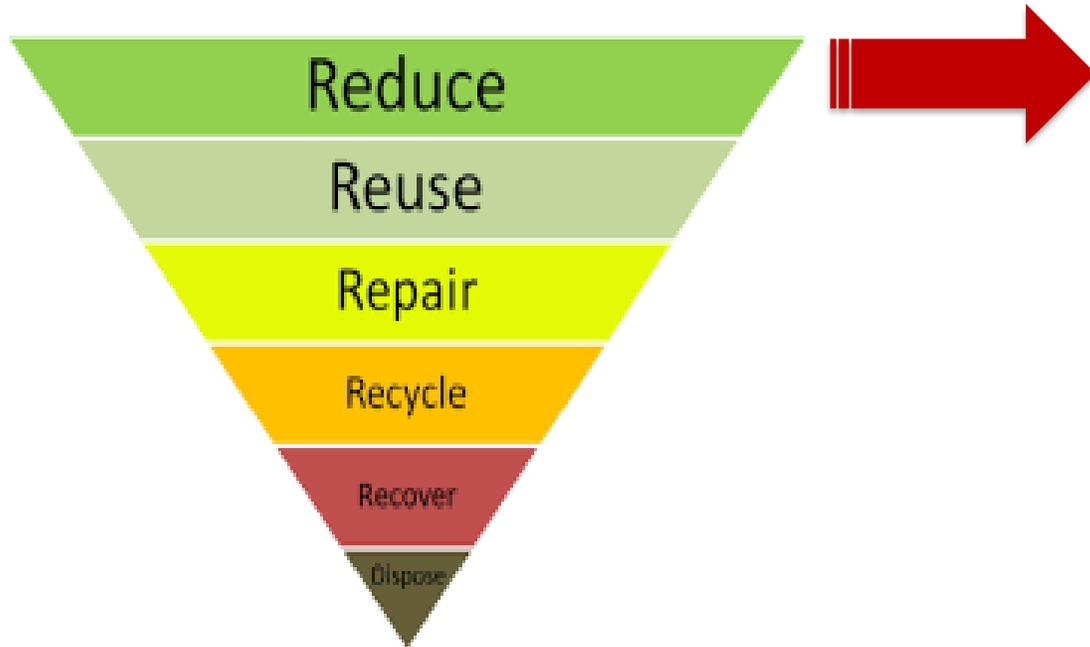
Retaining the Value, Rethinking Ownership, aligning Incentives with Regulation

From Waste Policy to Product Policy

From End of Pipe to Life Cycle Approach

Waste Framework Directive

Waste Hierarchy



Product Framework Legislation

From Waste Hierarchy to Product Hierarchy

Product Value Retention System

End of Product Status

Producer Ownership Concept

Design for Sustainability Requirements

Public Procurement Requirements

Product Passport

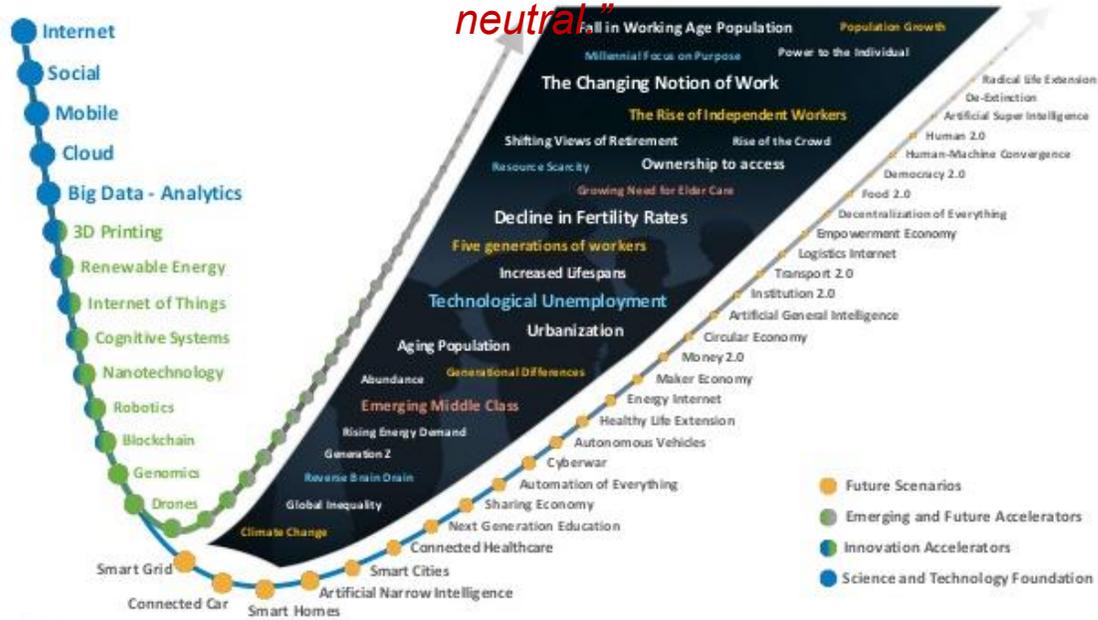
Registration for Market Access

....

And Digitalisation ...

Dr. Melvin Kranzberg - First Law of Technology:

“Technology is neither good nor bad; nor is it neutral.”



- *Digital will lead to massive improvements in efficiency, provision of goods & services etc. This can be either a push to a linear growth and consumption, or to a circular one.*
- *Digital Transformation can and should, be a major part of the solution in a transition to a more sustainable economy and society.*
- *It is our urgent political task to create conditions needed to place digitalization at the service of sustainable development.*
- *ICT sector should target to become carbon neutral as soon as possible.*

Current Developments

EU level

New Commission Priorities

In her speech before the European Parliament in July 2019, Ursula von der Leyen identified six priorities for her new team:



- *A European Green Deal*
- *An economy that works for people*
- *A Europe fit for the digital age*
- *Protecting our European way of life*
- *A stronger Europe in the world*
- *A new push for European democracy*

ALL LEVELS DO MATTER



A lot could be done on that level of **cities and regions** due to **relative autonomy** of the governance and many **concentrated CE related problems and opportunities**

(Sharing Models, Mobility systems, Waste Recycling, Sustainable Buildings, Energy Efficiency ...)



Governments should approach Circular Economy as an agenda for change to the the **SDG compliant economy** and adopt **Circular Economy Roadmaps or/and Action Plans**. They should **broaden the ownership of the CE idea** (Partnering with climate change, bio-economy, health, digital transformation, research and innovation, trade ...)



On an **international and global level** we should exploit the possibilities of **linking CE to already existing international initiatives and conventions**, exploit the need for a **Convention on Natural Resources**, **broaden the coalition of UN bodies** around CE and extend political focus from UN Environment Assembly (**UNEA**) to High Level Political Forum (**HLPF**) and UN General Assembly (**UNGA**)

Some Green Deal related considerations, which could be useful ...



1. Defined *SDGs Strategy* should be *mainstreamed through European Semester*
2. It is essential that all announced actions (Climate Law, new Industrial Strategy, From Farm to Fork Strategy ...) are *consistent with Green Deal* - operationalization of Green Deal
3. It should include an urgent call for bringing the *resource (and also nature-based) perspective in the climate negotiations* and combine energy with Circular Economy efforts
4. It should *broaden the current understanding and ownership of the Circular Economy*. It should advocate for and *integration of the circular economy, competitiveness and SDGs* agendas. MS should be asked to prepare *national CE Road Maps/Action Plans* (Eu Semester)
5. *Green financing* is essential. The *money for public intervention* is limited. It should set a clear commitment to urgently redirect state subsidies and public procurement
6. *External dimension* should be an important part of the Green Deal – European Union should be clear on the need and determination to lead the transition and efforts to create global level playing field, including by greening the trade
7. Particular attention should be given to *all levels of governance*. On a global level potential Convention on Natural Resource Management should be exploited (Council Conclusions)

Integrate Circular Economy, Digitalisation with Competitiveness (and SDGs)

- 1. For most of the critical **resources** Europe is **import dependent** - for 54 scarce and economically important raw materials, Europe depends 90% on raw materials imported from outside Europe (EC 2014);*
- 2. **Prices of resources** in the long term are increasing, in a short term they are volatile (IRP and Dobbs et al.,2013)*
- 3. The **share of the material costs** in the industrial costs is increasing (German manufacturing industry (1993-2011) increase from 37 to 47%, and the cost of labor decrease from 27 to 17% - VDI)*
- 4. **Social considerations** and social security are among core European values and we should protect them and saving the resources and costs connected to them is **politically feasible and attractive concept** - resources will not go on a street and protest.*
- 5. **Digital is a main driver of innovation** to make our European economy competitive, SDGs consistent, climate neutral and resource efficient*



Set and Example ...



European Committee
of the Regions



- *Public procurement for **traveling** should not be based only on the lowest price, but also on environmental footprint, one should for the beginning integrate at least CO2 emissions*
- ***Cooling and heating**, one could easily follow some of the best practices (like Japan), where cooling is only allowed when outside temperatures excess certain level, in summer no ties and short sleeves policy should be introduced*
- *All **food** provided in institutions should follow the healthy and sustainable food criteria and social fair trade sourcing*
- *Banning **plastics**, reducing **paper** ...*

TO CONCLUDE

Soren Kierkegaard



There are two ways to be fooled ...

One is to believe what isn't true.

The other is to refuse to believe what is true.

Using “alternative facts” will unfortunately not solve our problems!



*Special Report on global warming of 1.5°C
October 2018*



*Global Assessment Report on Biodiversity and
Ecosystem Services, May 2019*



*Global Resources Outlook 2019
March 2019*



*Global Environment Outlook 6 (GEO)
March 2019*

Common Conclusions Drawn from IPCC, IPBES, GEO, IRP reports

1. The challenge of *negative environmental change* has not only been increasing but *accelerating in the last decades*. The challenge is unprecedented in human history and bears extreme risks for human wellbeing around the world. Impacts on human safety are already perceivable and will accelerate *to dangerous levels very soon*. *Causes and impacts* of environmental change are highly *unequal around the world*.
2. *Climate change, biodiversity loss, and the unsustainable use of resources* can still be *mitigated* to avoid reaching tipping points of global catastrophe; *the investment need for action is clearly lower than the cost of inaction*.
3. Doing so *requires transformative change*. The solution is not found in remedying current economic systems of production and consumptions, *we need to change the fundamentals*.
4. *Transformative change needs to start immediately, and trends must be turned around before 2030* to avoid irreversible levels of impact.
5. *Innovation and investments needed for the sustainable transition have wide co-benefits that are very likely to lead to better economic progress underpinned by a global innovation wave and close cooperation*.



Common Conclusions Drawn from IPCC, IPBES, GEO, IRP reports

6. To avoid dangers and reap the economic potential of the transition, *global governance and institutions need to improve*. Countries must cooperate more closely, and so need sectors. *“Environmental” action can no longer be a silo, but must become a priority across health, economic, financial, industrial and technological decision makers.*
7. Better governance has to solve, among others, *central tasks highlighted across all reports*:
 - *Economic governance must modernize their calculation and use of ‘prices’ and ‘costs’. Prices of products and services must move to incorporate environmental and health costs, and other so called “externalities” across value chains.*
 - *The world needs to agree a common understanding of practicable targets and indicators for sustainable production and consumption. The 1.5oC target for limiting global warming is an important start and similarly clear targets must be set for all those areas that crucial for humanity’s safe operating space. Ideally, these targets would cover all fundamental impacts, such as air pollution or water stress, as well as link to their causes, such as material use.*
 - *International and national governance must reform harmful policies and subsidies that are currently causing high adverse impacts.*





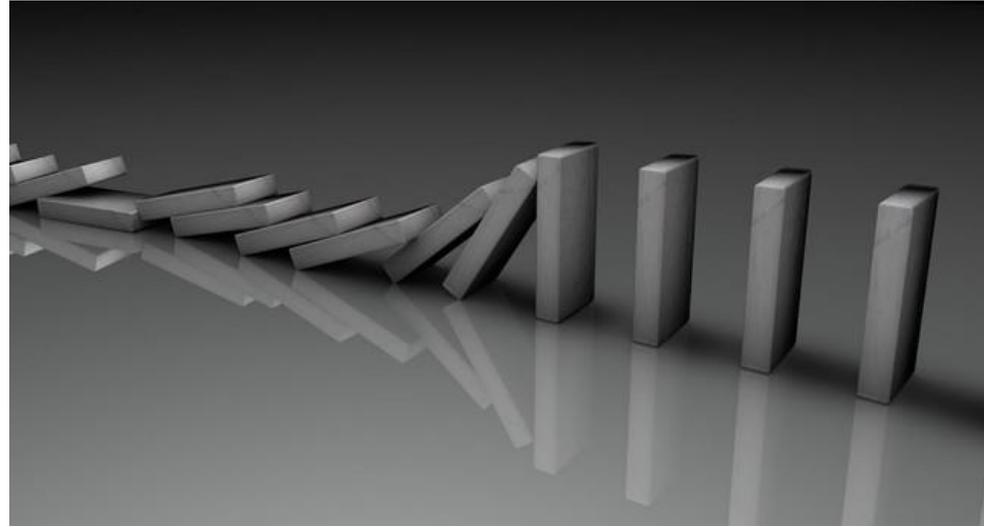
- *The challenge seems to not be one of not inadequate scientific evidence anymore; rather it is one of **cooperation and implementation**.*
- ***Complexity and scale of these challenges requires** a space that allows actors with responsibility for those environmental governance mechanisms to be able to consider and experiment with both **new forms of collaboration and more „systemic“ approaches** ... through promoting multi stakeholder cooperation, more agile governance (including sub-state actors, such as cities, states and provinces), the use of new technologies, and enhanced accountability and transparency.*

We need more “Circularity” even in the
GLOBAL GOVERNANCE



Sharing sovereignty instead of owning sovereignty

Transition to a more sustainable economy and society

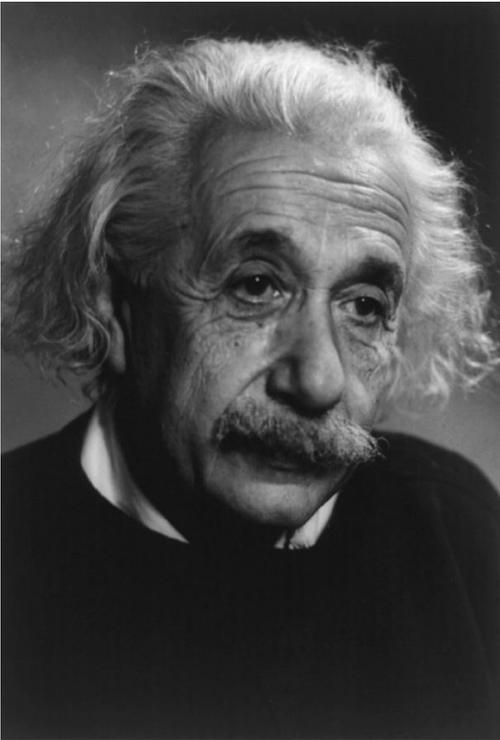


IS UNAVOIDABLE!

*Humans are supposed to be **intelligent**. It is high time to prove it.
We have to fix a broken **compass!***

WILL IT BE EASY?

ALBERT EINSTEIN



When asked why it is that mankind has stretched so far as to discover the structure of the atom, but we have not been able to devise the political means to keep the atom from destroying us he replied:

“That is simple, my friend. It is because politics is more difficult than physics”

Why the changes are so difficult in practice?

- While the challenges we face require a deep systemic change and long-term rethinking of the way how we govern our societies, political cycles, public and financial institutions, to a large extent also private companies, have inbuilt **short-term focus and logic**. This inconsistency limits our ability for efficient and strategic action.*
- Production and consumption systems are based on the **logic of consumerism fuelled by quantity-driven profits and growth measured by GDP**. GDP could be best explained by saying, that one will not reach the goal by walking faster, if walking in the wrong direction! We have to fix a broken compass!*
- **The existing lock in, and vested interests** – companies are thinking strategically, they know where they would like to be in the future, but they also know where they are now. They struggle how to make a transition and stay profitable in the short term.*
- A transition to a more sustainable economy and society will only be possible if it is **just, fair and inclusive**. We have to make our societies more equitable and do more in the fight against poverty. Social unrest is growing even in high-income countries and it is high time to hear the echo of the streets and the voice of a frustrated young generation.*



“North Star” guiding our policies and behaviour

GREEN DEAL: INTER-GENERATIONAL AGREEMENT

A Program for the Future Generations

“Sustainability First”

Circular Economy is not a new concept



*It is the oldest concept on the earth. All **nature is organized based on the principles of the circular economy.** Nothing is lost and everything has its purpose.*

*That is why it would make common sense to **embrace it** and finally start to **behave accordingly.***

*In essence there is only question we have to answer:
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 advise 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 myself, it is very important to establish a healthy distance to himself.



International
Resource
Panel

S Y S T E M I Q

UN 
environment



THANK YOU

For more information

Contact IRP Secretariat at resourcepanel@un.org

Visit our website at <http://resourcepanel.org/>