



e a s t

*Sustainable Economy
and Society*

Circular Bio-Economy



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Partner SYSTEMIQ*

Brussels, 20th February 2020

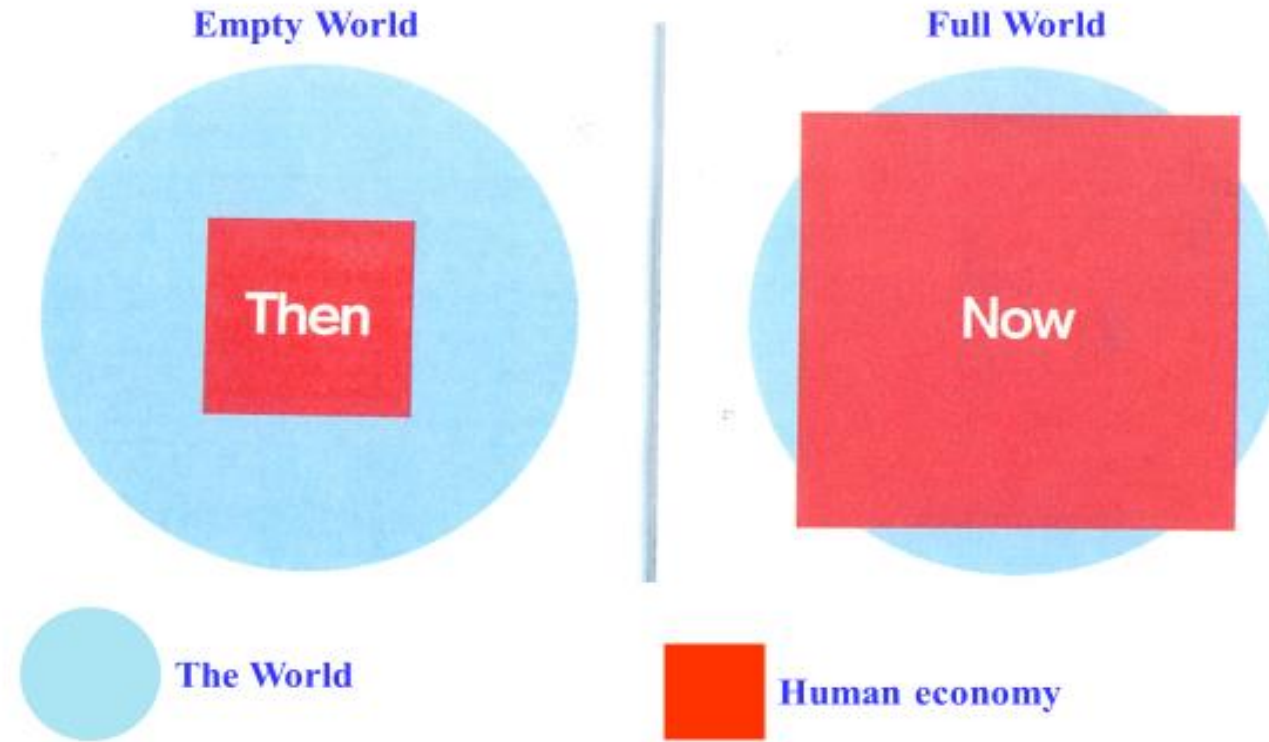


*For the first time in a human history we face the emergence of a single, tightly coupled human **social-ecological system of planetary scope.***

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

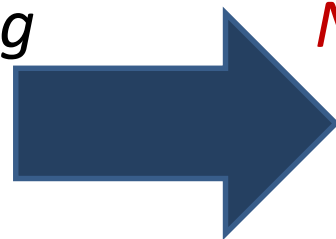
*Our individual and collective **responsibility** has enormously increased.*

Empty World and Full World

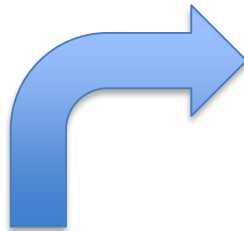


Source: Club of Rome: Simplified after Herman Daly

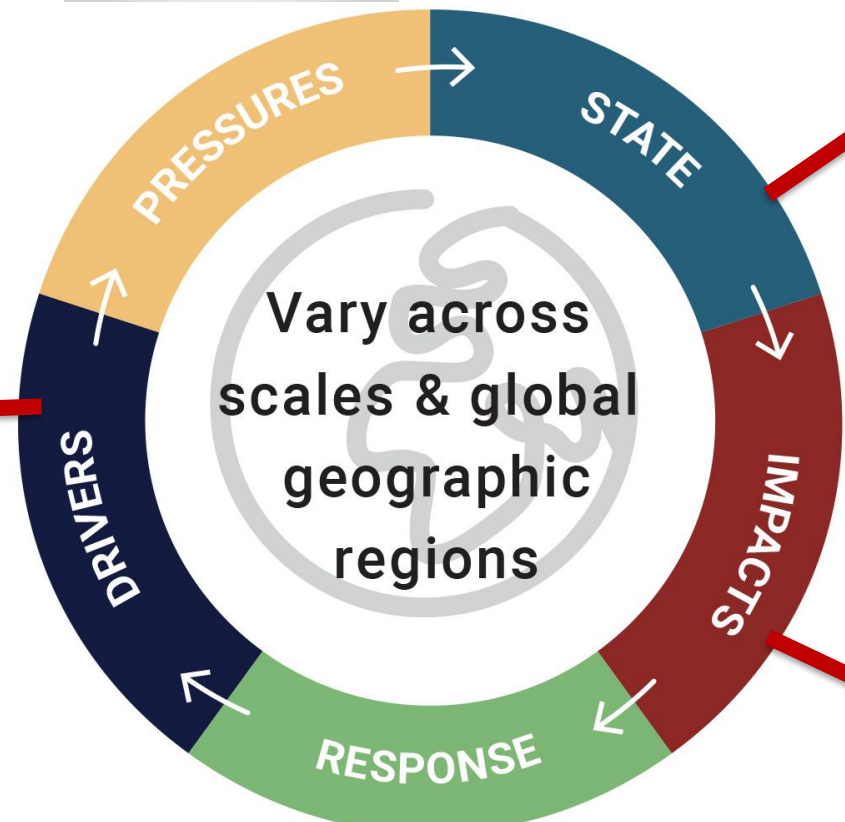
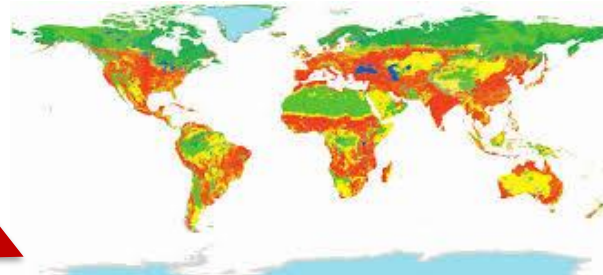
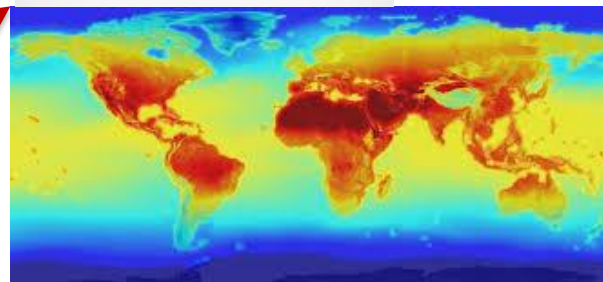
Labour and Infrastructure limiting factors of human wellbeing



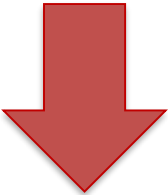
Natural resources and Environmental sinks limiting factors of human wellbeing



ipcc
INTERGOVERNMENTAL PANEL ON
climate change

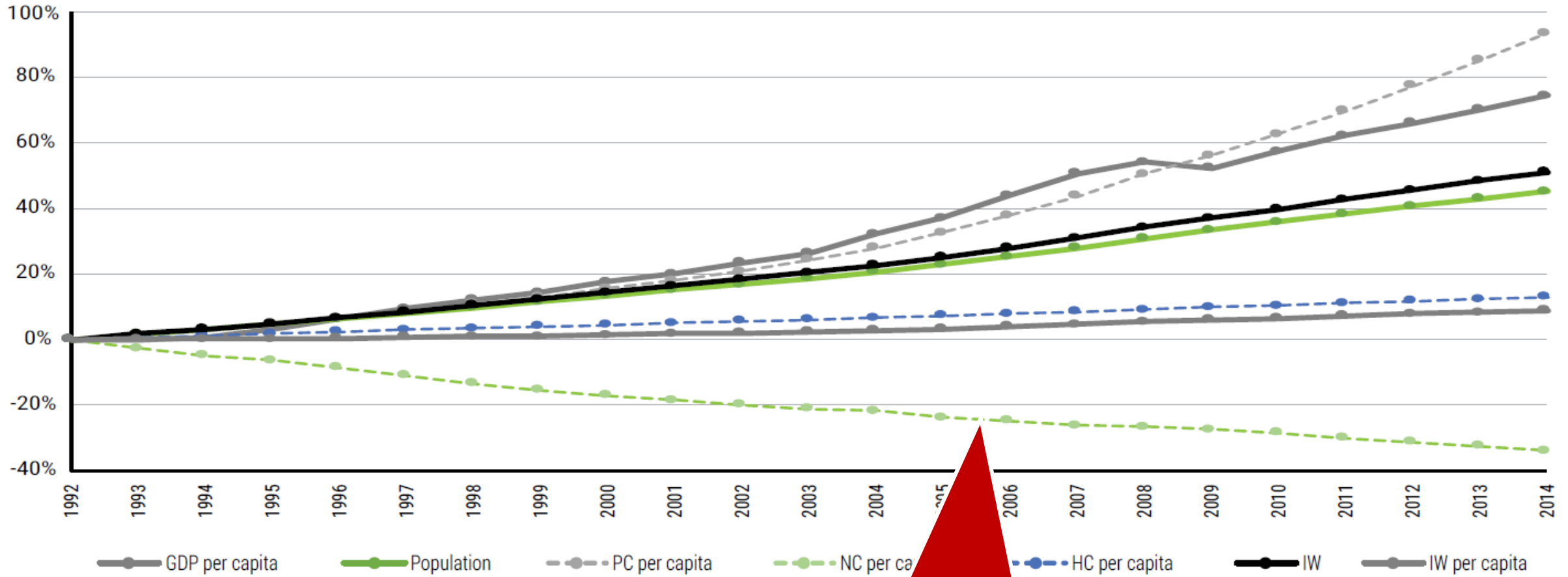


Our Economy



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

Source: UN, 2018 Inclusive Wealth Report 2018

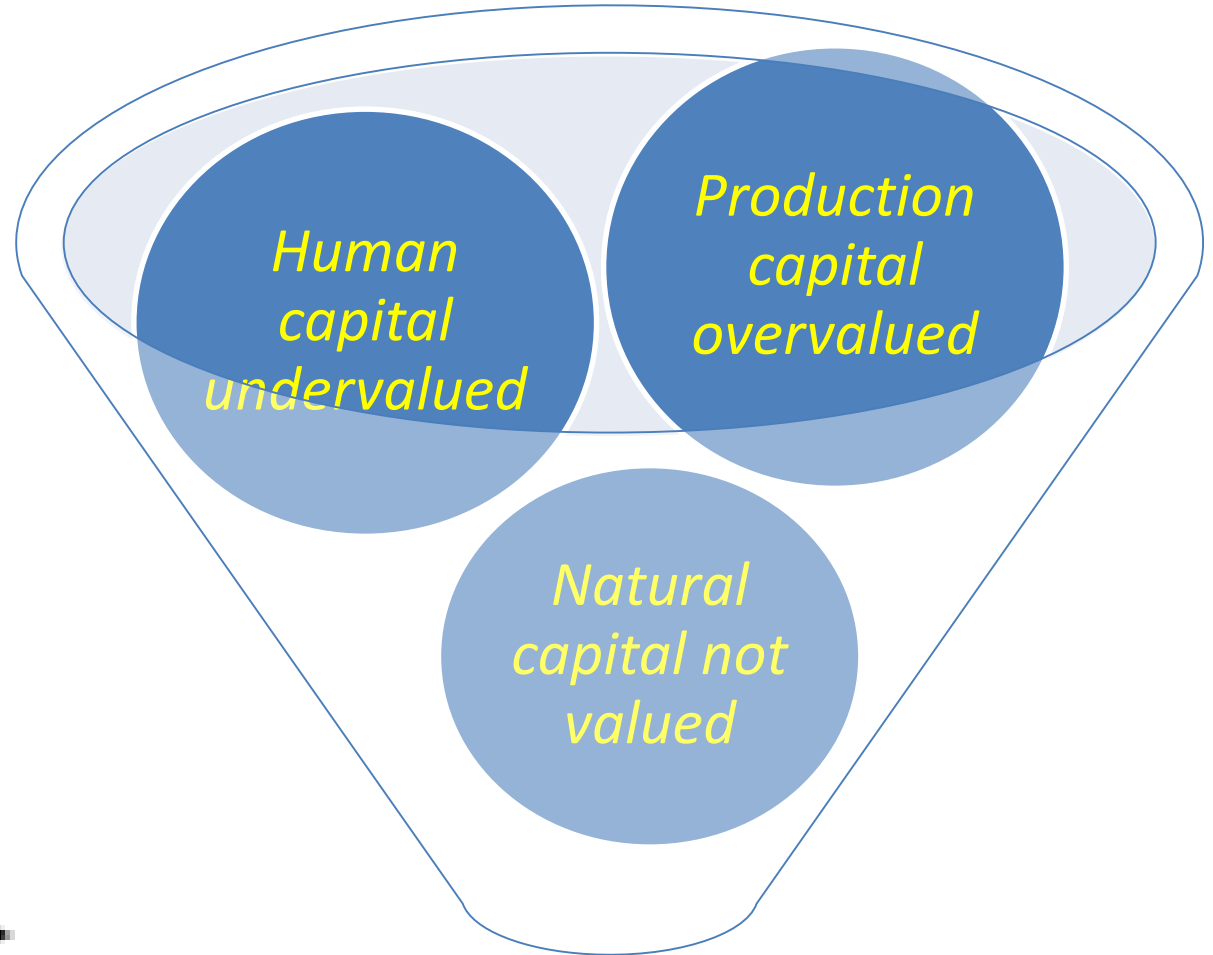
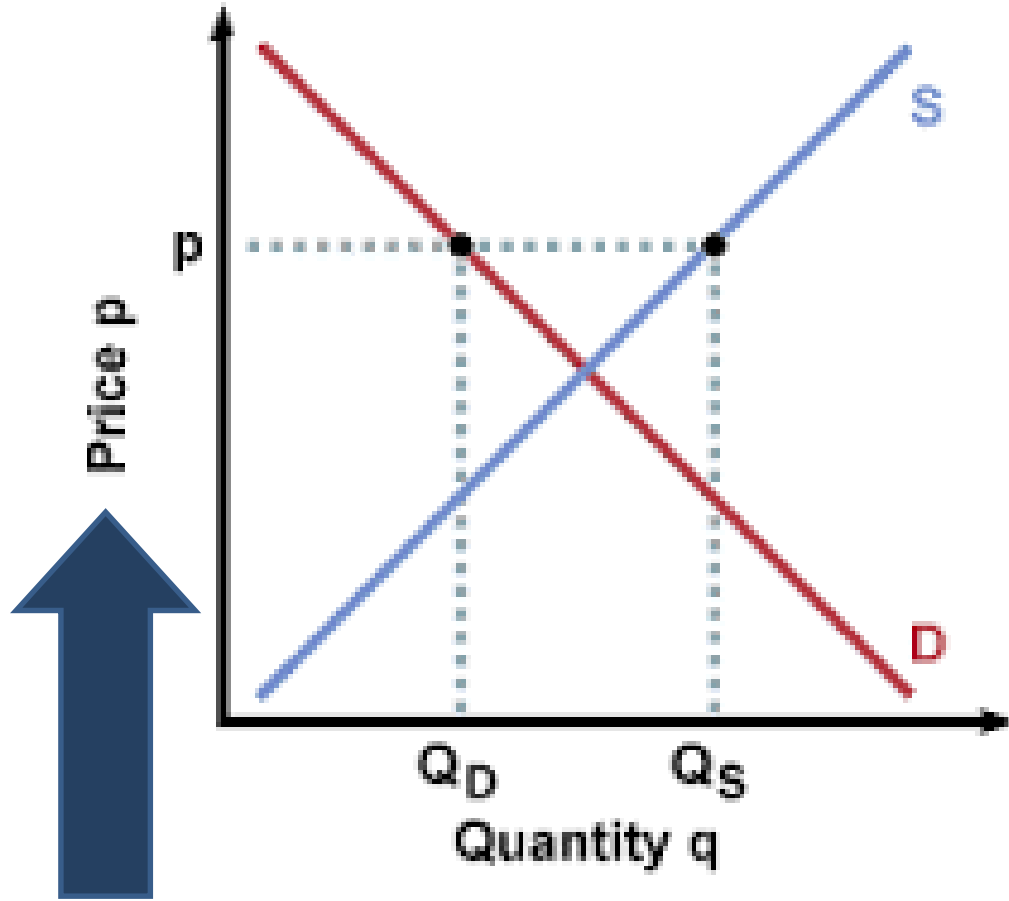


IW – Inclusive Wealth
PC – Production capital
HC – Human capital
NC – Natural capital

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

*Producers/Consumers
Rational Behaviour*

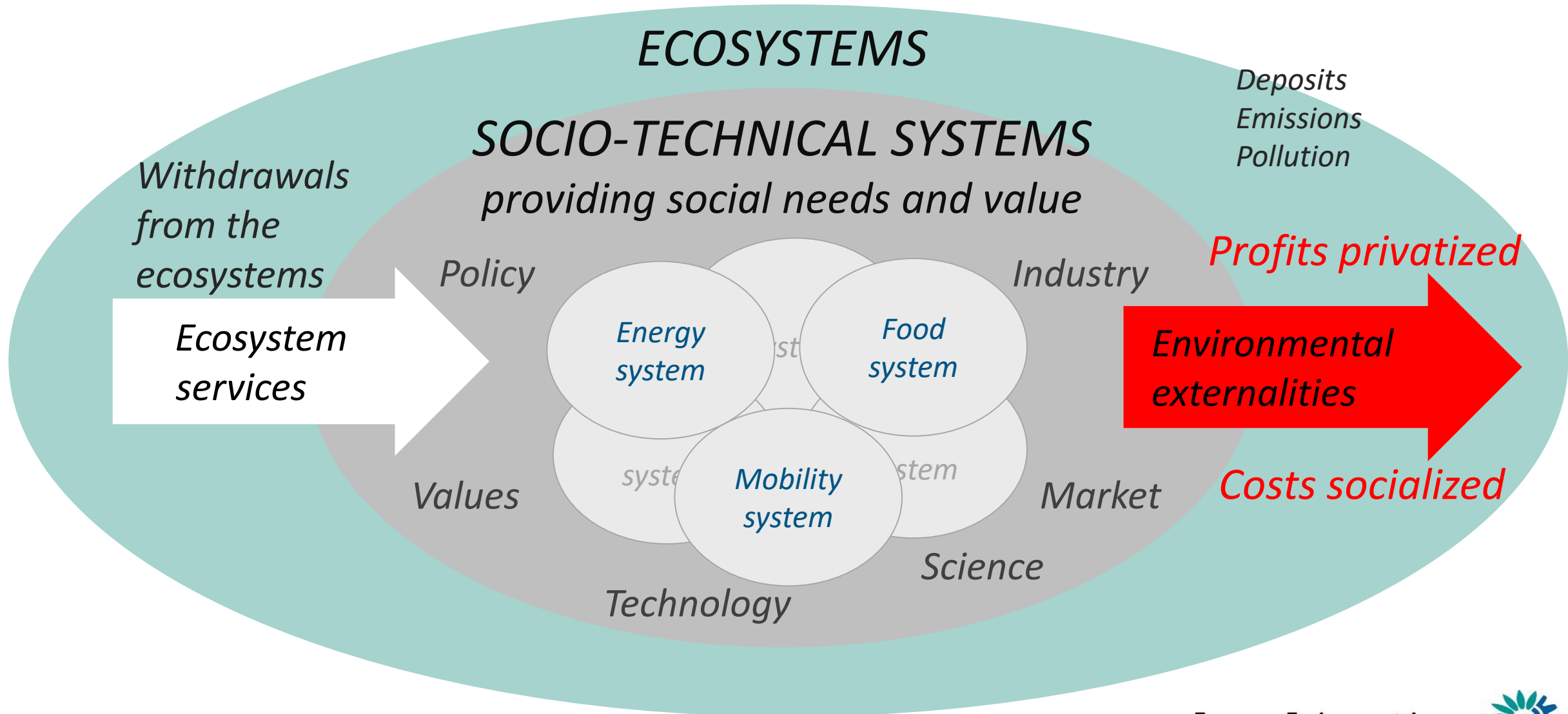
Market Economy



*Economic, social and
environmental (in)balance*

LIVING WELL WITHIN ECOLOGICAL LIMITS

ECONOMIC SYSTEM FUNCTION OF ECOSYSTEM





International
Resource
Panel

SDGs DIRECTLY DEPENDENT ON NATURAL RESOURCES



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...)

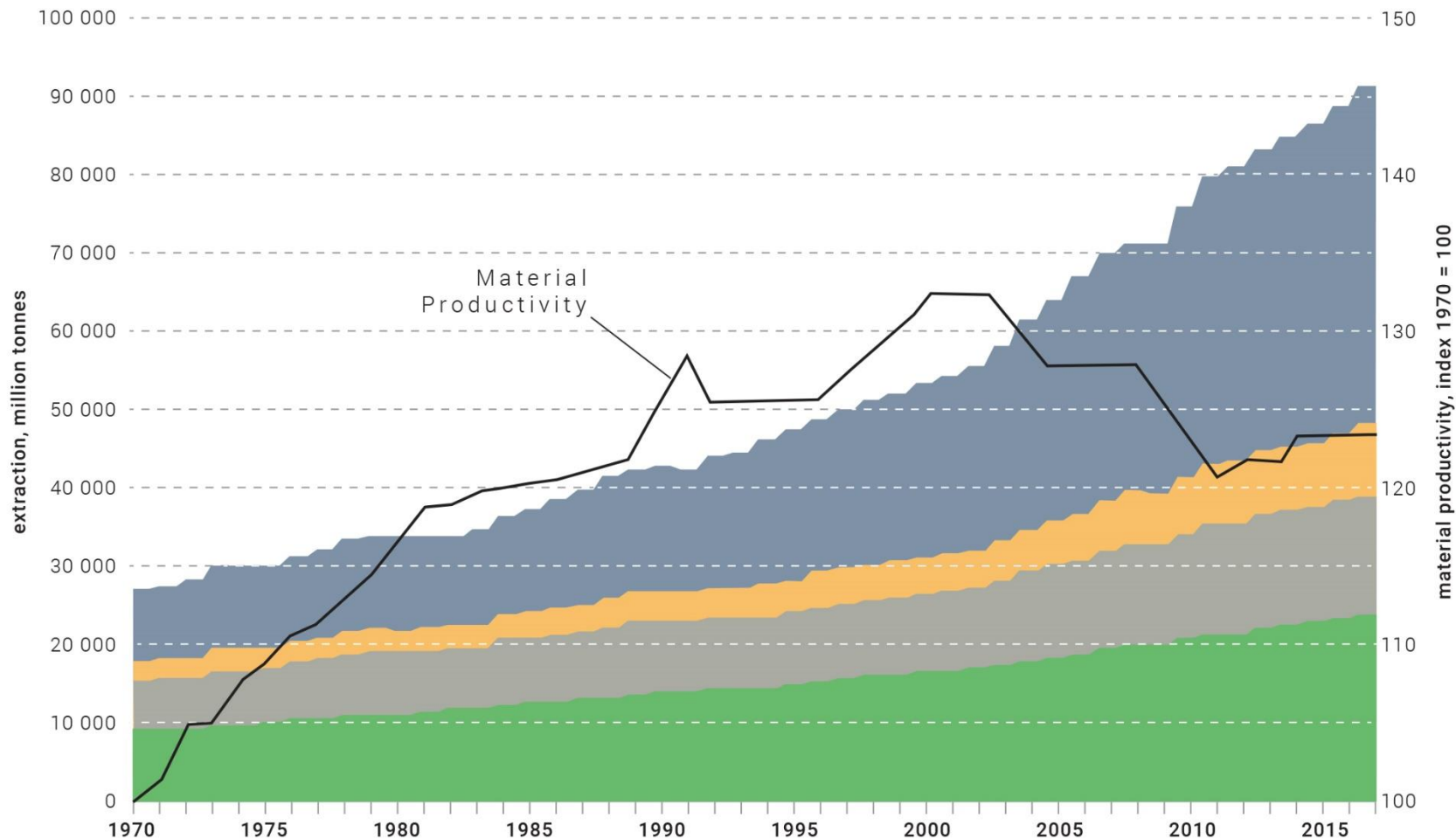


Non-metallic minerals

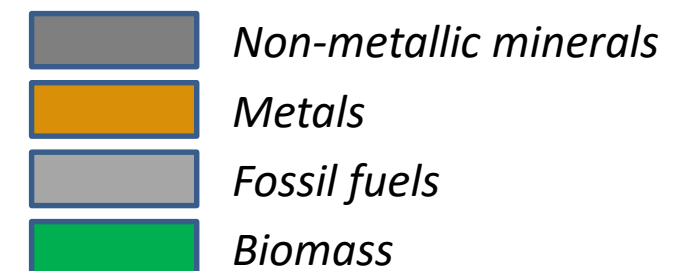
Non-metallic minerals (including sand, gravel and limestone)

Relentless demand: Global resource use, Material demand per capita and Material productivity 1970-2017

Global material extraction and material productivity, 1970 - 2017



- *Global resource 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*



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



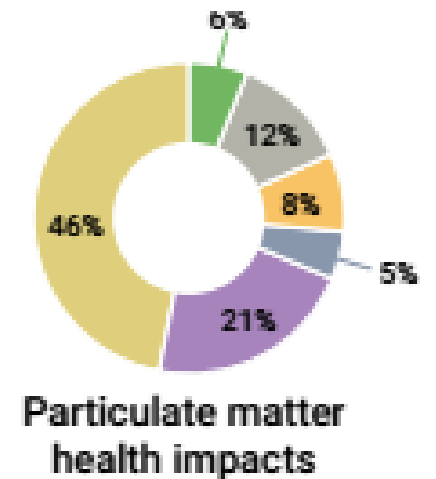
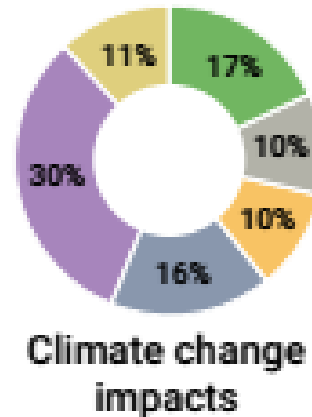
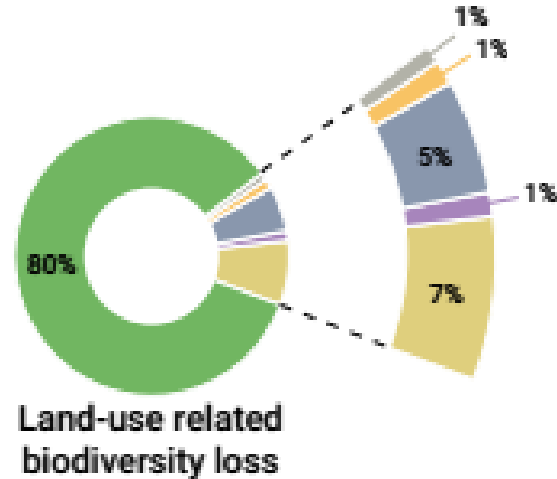
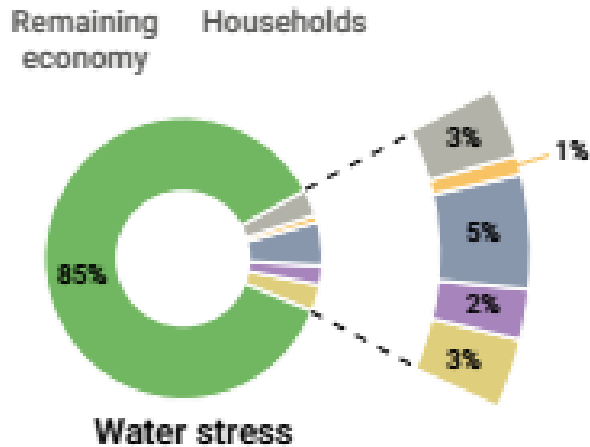
Fossil fuels



Remaining economy



Households



Resources use and impacts magnified: Biomass responsible for over 80% of water stress and land-use related biodiversity loss and 17% of climate impacts



Biomass

**Use of biomass
1970 and today (2017)**
(see also figure 2)

Extracted 1970 **9 billion tonnes**

Extracted 2017 **24 billion tonnes**

Biomass extraction has **increased 2.7-fold between 1970-2017**

**Impacts of extraction
and primary processing
today (2017) - in shares
of total global impact**
(see also figure 4)

17%

of global
**climate change
impacts**

07%

of global
**particulate matter
health impacts**

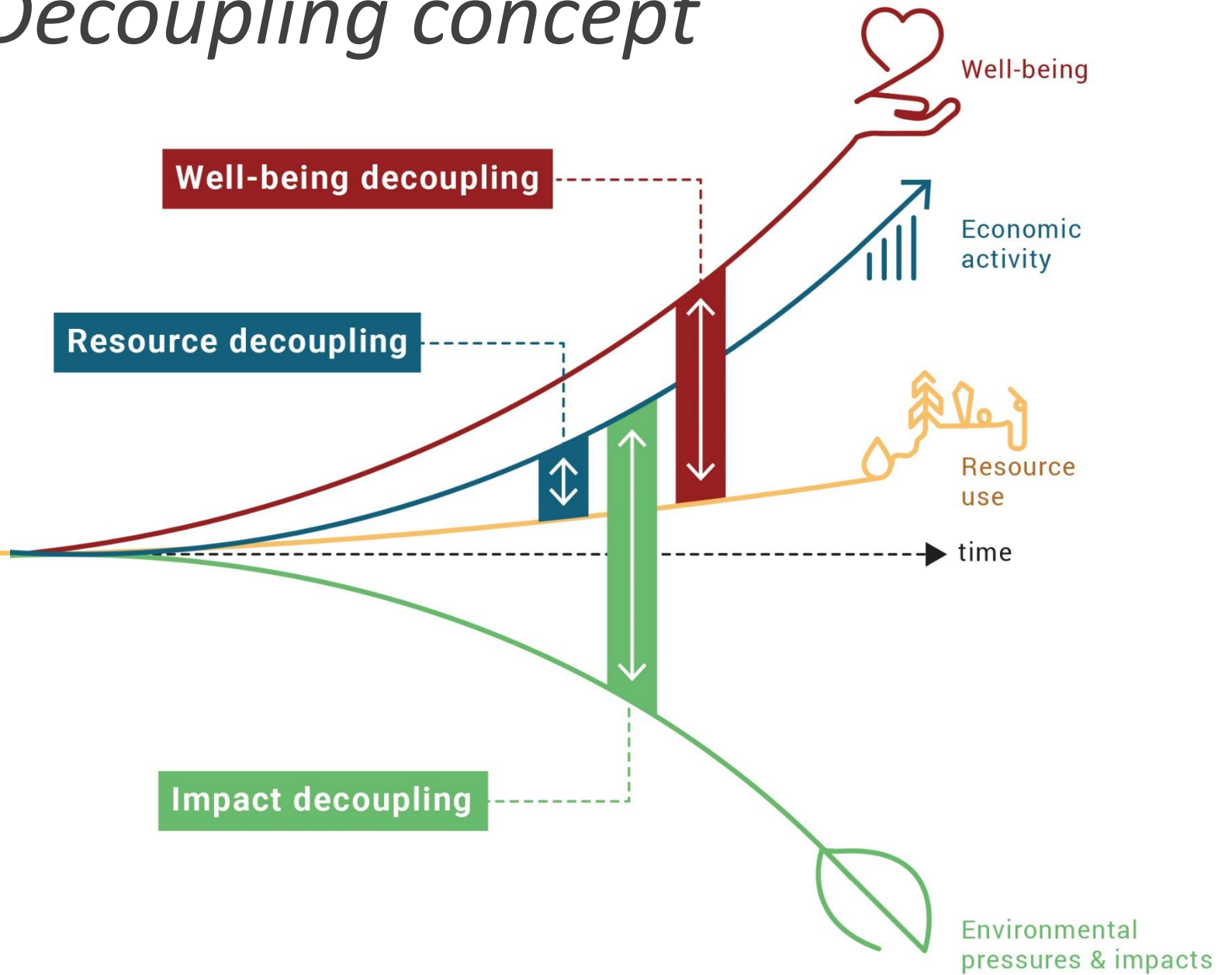
Over
85%

of global
water stress

Over
80%

of global
**land-use related
biodiversity loss**

Decoupling concept



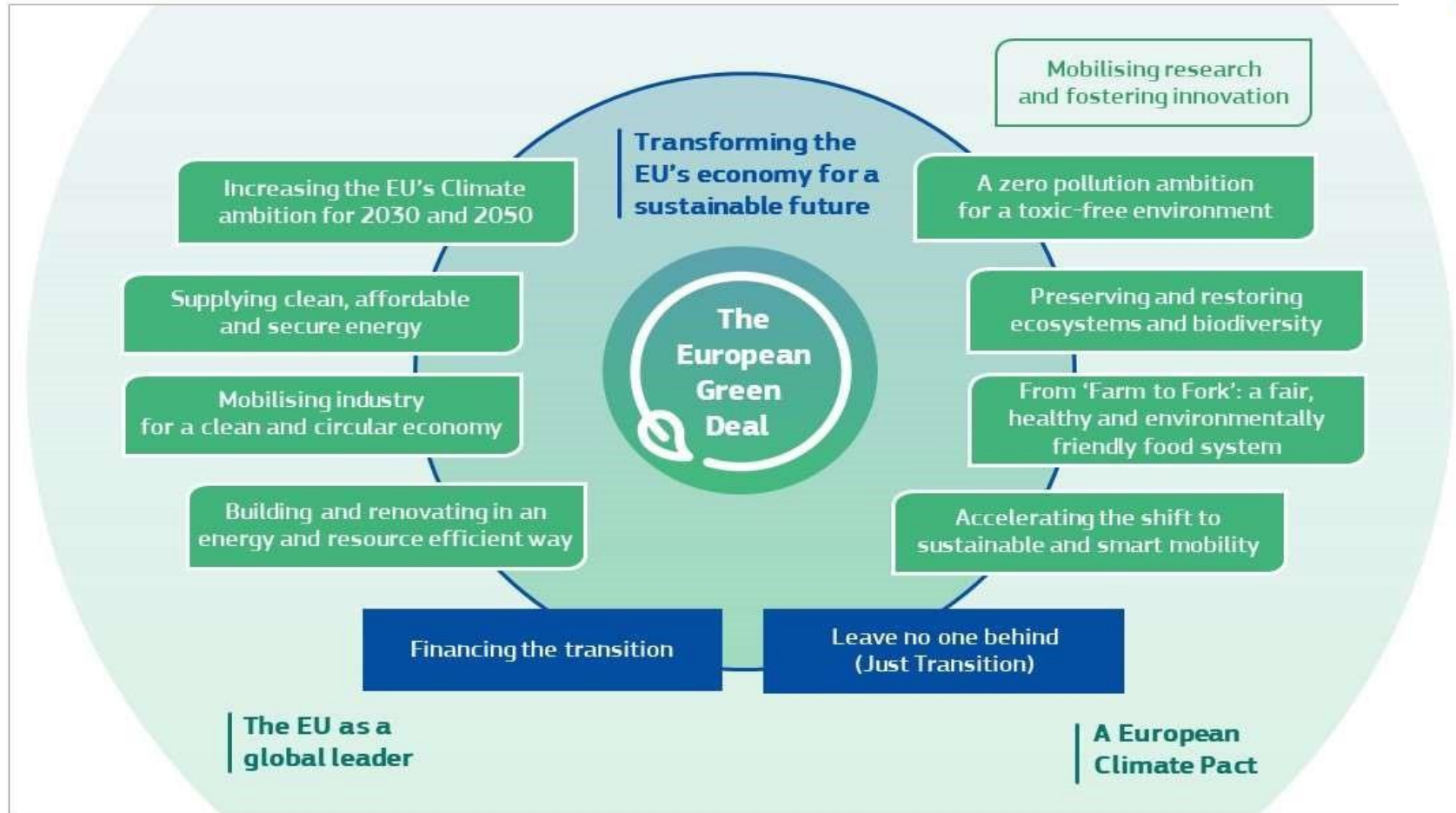
New Commission Priorities

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*

Green Deal



Green Deal – Important to Remember

*Document is introducing **new logic, new approach, new political narrative** ... something which was till now not present in the EC approach. Just a decade ago it was impossible even to add sustainability to the “Growth and Jobs” narrative. Green Growth is setting a clear sustainability criteria and direction.*

*A lot of attention is given to **social considerations of the transition**. Green Deal depends on the acceptance of the proposals done, particularly from the socially more vulnerable groups of people. Recent experiences are clear. Ignoring them would be a major mistake. This is understandably sometimes leading to some compromises and deviations from clear principles and orientations in the document.*

Green Deal – Critical Assessment

1. There is a *gap between in the ambition set in the opening of the document and strategic vision for needed system changes* in the following concrete policy chapters.
2. *Inconsistency* exists among the *ambition set in the document and the fact that MFF proposal was set by the previous EC*, where the narrative and understanding of the urgency for change was still quite absent. MFF is setting financial framework till 2027 and there will be no other budget on the EU level to deliver on SDGs and Paris commitments.
3. Document is *“climate biased”*. While biodiversity and zero pollution are addressed only in specific chapters, climate is mainstreamed through the whole document.
4. The need that prices and costs of products and services must move to incorporate environmental and health costs, and other so called *“externalities”* across value chains is *not introduced in a systemic way*. The commitment to *change the way we measure growth, progress, wellbeing* is missing.
5. The link to the *importance of decoupling resource use* (water, land, materials) from economic growth *for an effective climate policy* is *still not clear* enough.

Green Deal – Critical Assessment

6. Clear orientation in the direction of *dematerialization, rethinking the concept of ownership and moving from resource efficiency to resource sufficiency* is missing
7. Chapters talking about the transformation of the food, buildings and mobility are designed *without real system change logic and needs*.
8. In biodiversity chapter, particularly *reforestation and afforestation* concepts need clarifications.
9. The *importance of finance and innovative thinking*, risk (re)definition, is central and we are still do miss a needed clear and bold orientation shift in the sector.
10. There are clearly gaps existing when it comes to *global governance*, like for example an idea supported in the recent Environment Council Conclusions of the need to exploit establishment of a Convention on Natural Resource Management.

Green Deal

EPC: A promising start and a long road ahead

*Lots of new initiatives are announced for early days of the new commission, good, since it is no time to loose, but it might lead to a missed opportunity of **creating stronger ownership**, which could complicate the ability to implement proposals in practice.*

*European Commission needs, in the first place, an **appreciation** of the work done and a **sincere help** in filling some of the gaps identified.*

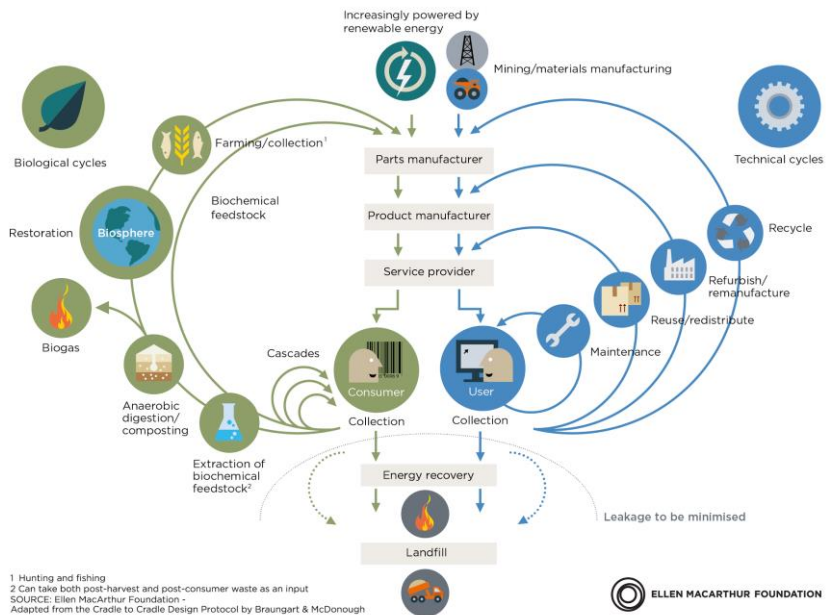
*Johann Wolfgang
Goethe*



imdb.com

*Knowing is not enough; **we must apply.**
Willing is not enough; **we must do.***

CIRCULAR ECONOMY - an industrial system that is restorative by design

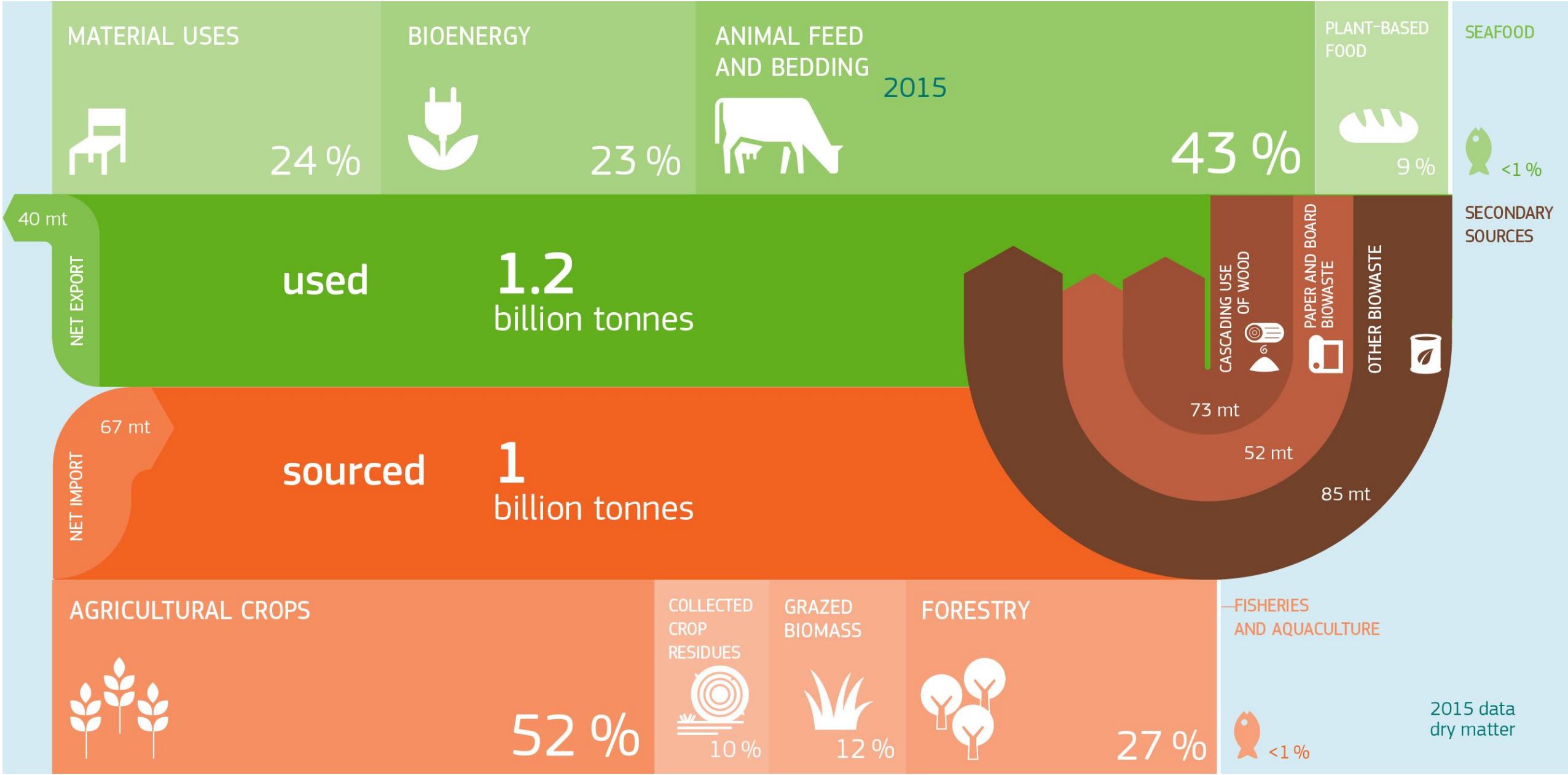


Green Deal is based on Circular Economy.

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.

CIRCULAR ECONOMY
AND BIO-ECONOMY

Is there enough biomass for a sustainable Bioeconomy?



How much *biomass each of us is using* in the EU?

MATERIAL USES



536 kg

BIOENERGY



525 kg

ANIMAL FEED
AND BEDDING



975 kg

PLANT-BASED
AND SEAFOOD



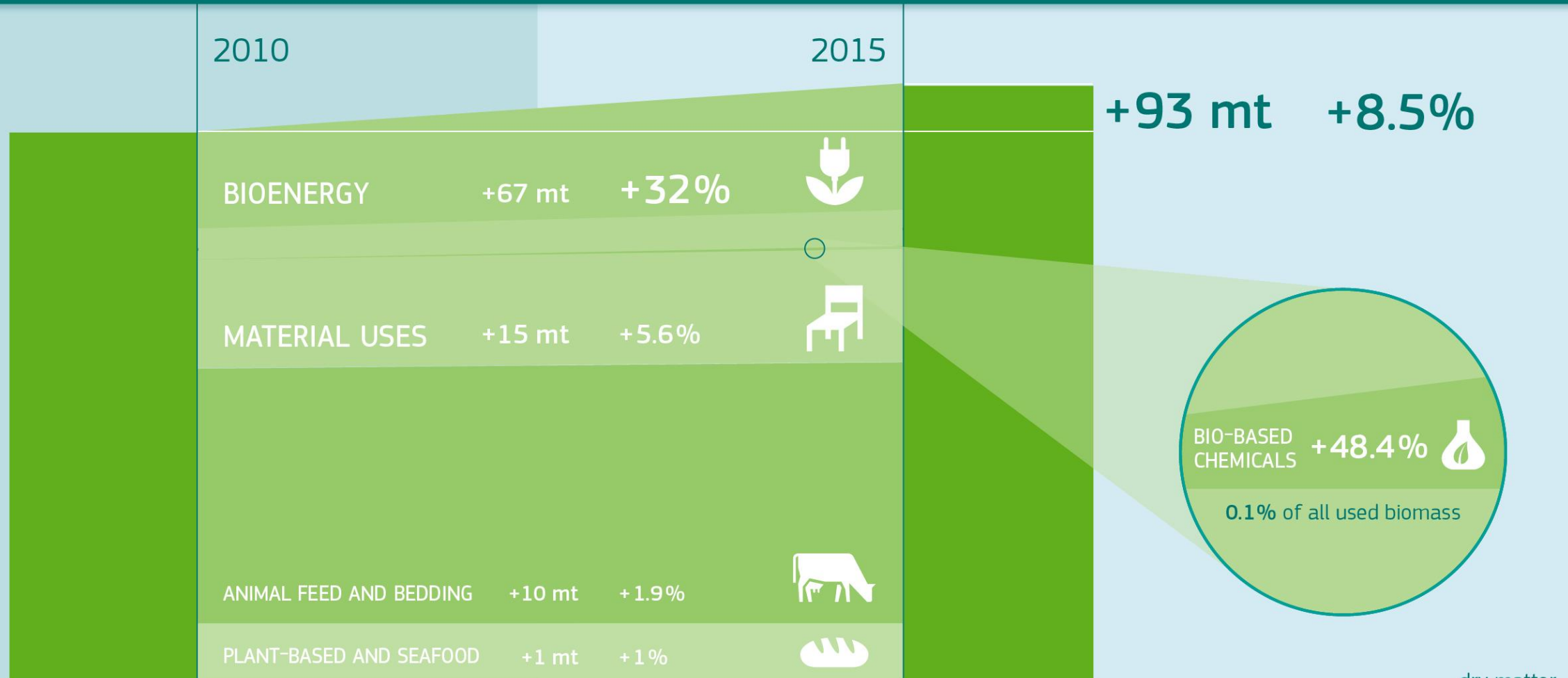
223 kg

used

2.3
tonnes

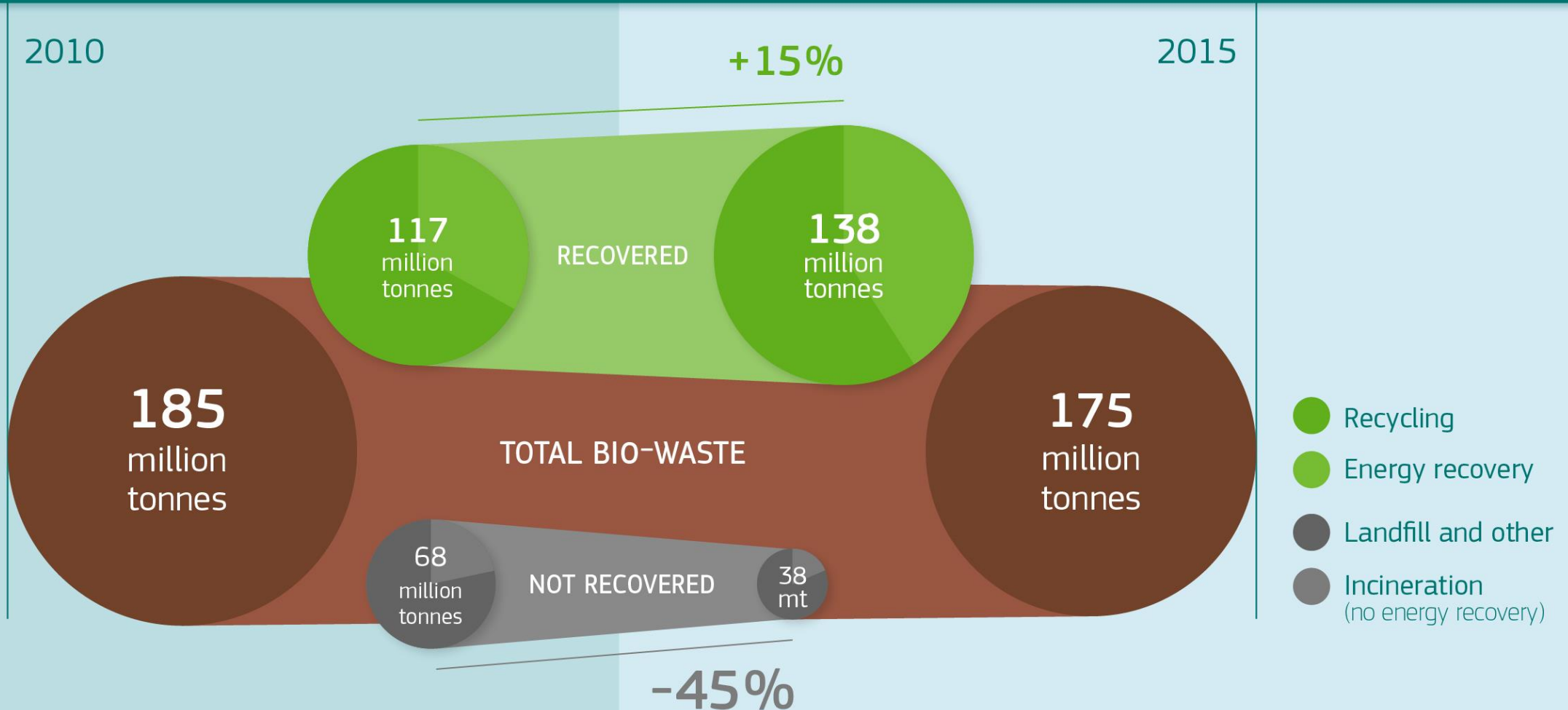


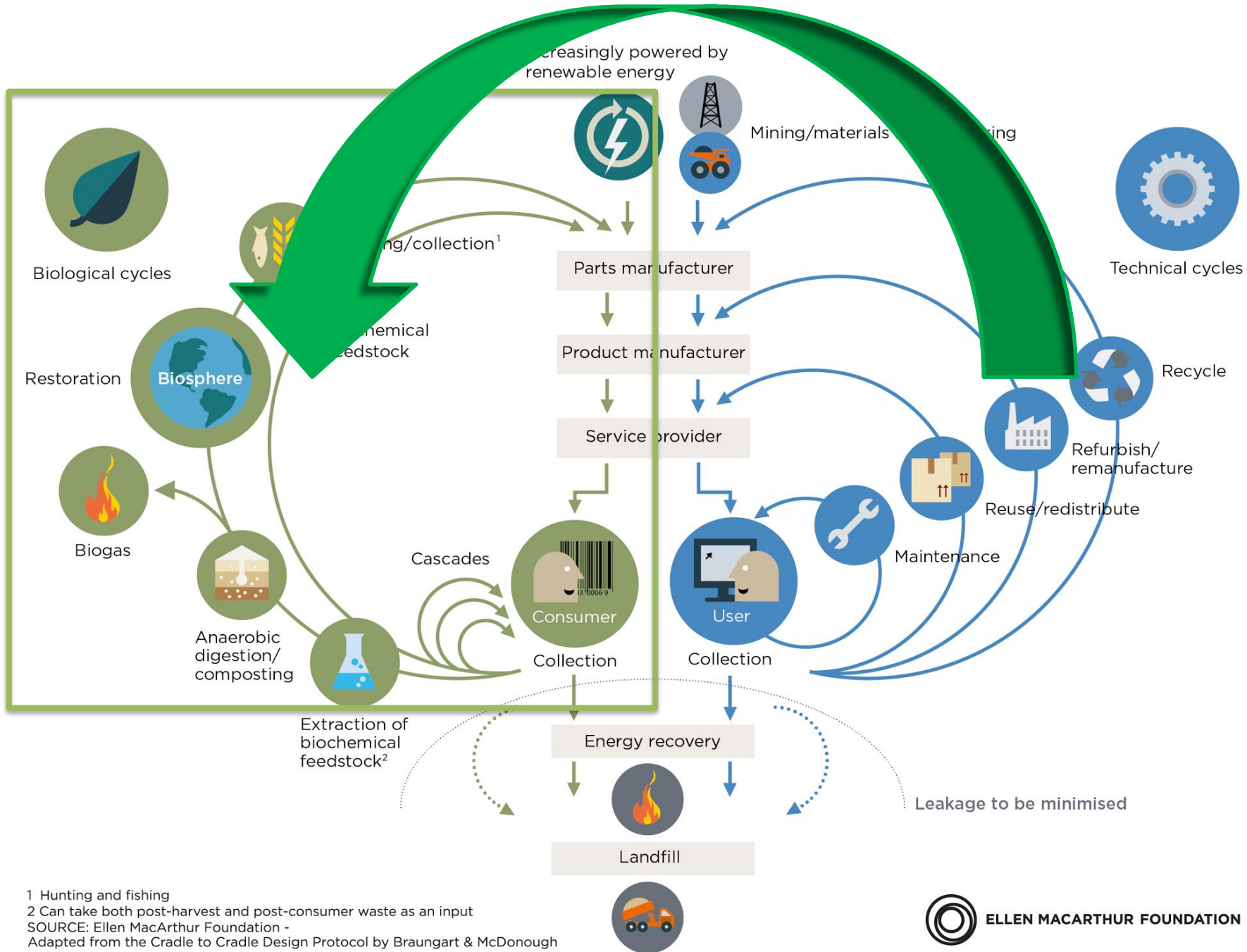
How has the *use of biomass evolved* in the *EU* over the last years?



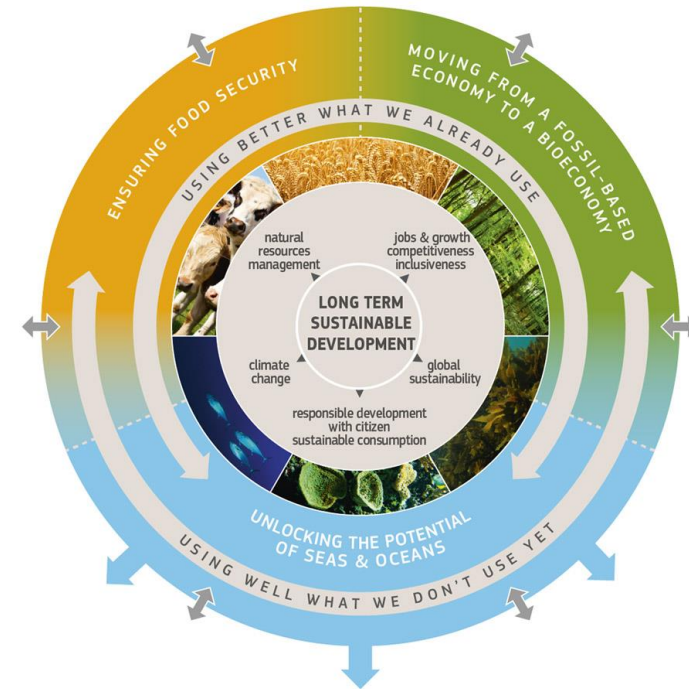
dry matter

Adding value to bio-waste



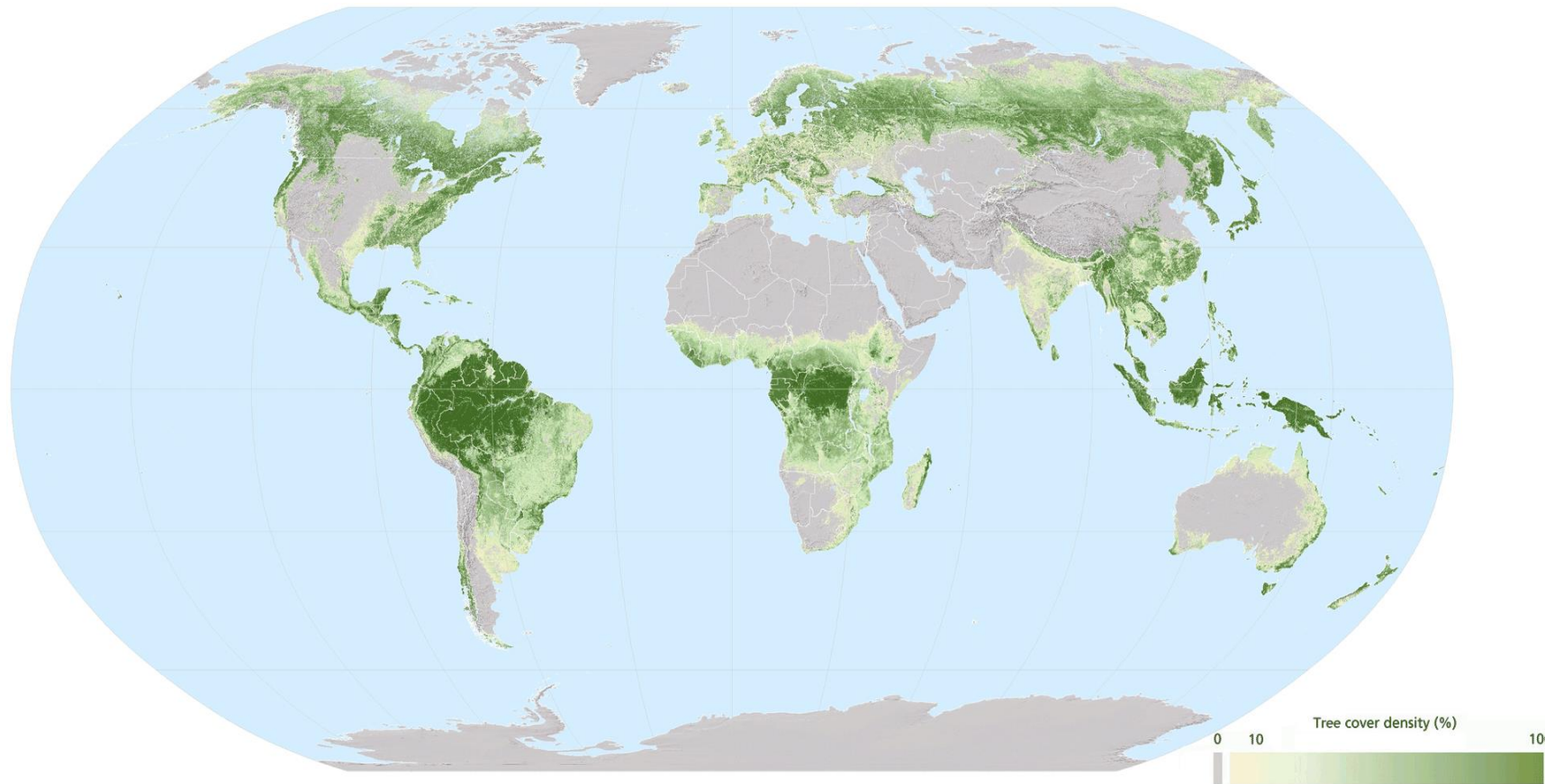


BIOECONOMY AND CIRCULAR ECONOMY



1 Hunting and fishing
 2 Can take both post-harvest and post-consumer waste as an input
 SOURCE: Ellen MacArthur Foundation -
 Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough

FORESTS AT THE HEART OF A CIRCULAR BIOECONOMY: COUPLING ECONOMY AND ECOLOGY



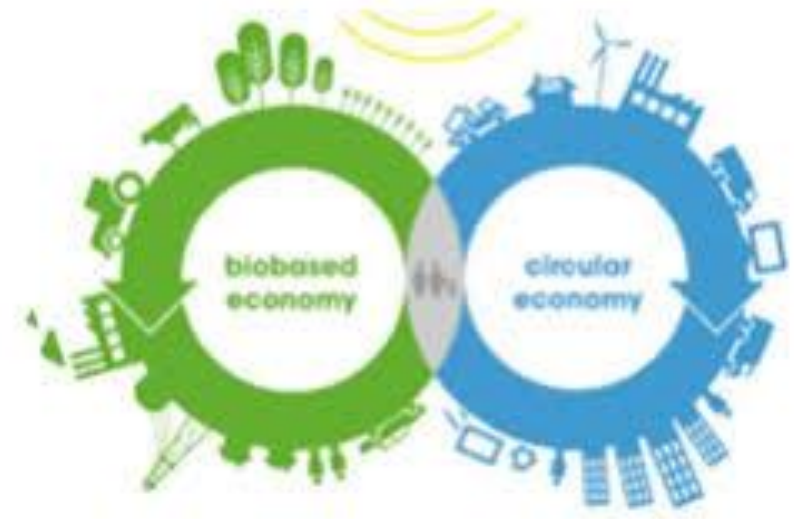
Largest terrestrial carbon sink and main source of precipitation, oxygen and biodiversity

Largest source of non-food non-feed renewable biological resources

CIRCULAR ECONOMY AND BIOECONOMY

Some Interesting Questions

- *How to improve nutrient cycles*
- *Circular design of bio-based products*
- *Integrating well informed consumers to better play their role*
- *Renewable Carbon potential*
- *Waste prevention*
- *Better waste management*
- ...



SOME OBSTACLES AND CHALLENGES

- *Trade-offs between biomaterials/bio energy/farming (fibre/fuel/food) and with other services provided by ecosystems (oxygen, water and temperature regulation, nutrients, biodiversity)*
- *The definition of cascading is not universal*
- *Supply of sustainably produced biomass and soil balance should be ensured*
- *Mixing bio and technical materials could create difficulties for CE*
- *Substitution of products should be dealt with care after assessing environmental impacts*
- *Focus should not be only on products and materials, but also on systems and business models*

ALIGNING INCENTIVES WITH REGULATION

AGRICULTURE - FROM PRODUCT TO SERVICE BASED CROP PROTECTION

- Digitalisation is allowing *targeted approach to individual plant protection - precision farming* is an already known instrument, but producers are still quantity based driven.
- Instead of selling pesticides, chemical companies could sell *services* to protect (hectares of) plants from pests. This would incentivise them to increase profits through minimising the costs of resources used, including pesticides.



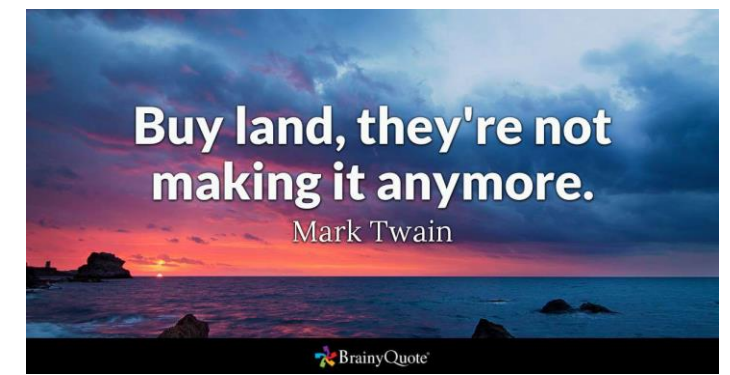
BIOECONOMY

HAS A MAJOR DEVELOPMENT POTENTIAL

*But it has to respect sustainability criteria
and it has to be complementary and in line with
decoupling and circular economy principles*

There is a need for

EU2050 Sustainable Land-Use Roadmap



- *Biodiversity* - "Increase protected areas to 30% (+4.3% points comparing to 25.7%)"
- "The new EU *forest* strategy will have as its key objectives effective afforestation, and forest preservation and restoration in Europe" – Green Deal
- Agricultural needs for productive land to sustain the security of *food provision* and declining *soil quality* are among main agricultural problems
- Trends in increasing use of the biomass for *bio-energy* production (+32% 2015/2010)
- EC/High speed Europe – "Fighting climate change, by developing a *trans-European HSL network*, is one of the European Union's main objectives."
- EC/Electricity Interconnection Targets – "To achieve its climate and energy goals, Europe needs to improve *cross-border electricity interconnections*"
- *Urban sprawl* - "Is increasing on average in the EU by around 2% a year"

FUTURE CAP

SOME INITIAL THOUGHTS (2016)

- *Sustainability of the food system* is not responsibility limited to the agriculture. It can only be reached if all actors in the *food chain* are playing active role. We need to integrate various policies and search for solutions beyond the agricultural remit.
- Agriculture community should *recognise the seriousness of the problems and actively engage in necessary transition*. Environmental community should recognise farmers as *partners for change*.
- Farmers were in the past *acting in good faith*. They need and deserve public support for *transition*. Recognition of the need for transition would *enable the necessity for financial support* in the future.
- CAP should be reoriented towards *public support for transition and provision of the public goods (sustainability and health should be better factored in)*
- *CAP adoption process* needs to be improved - partnership among agricultural and environmental community should be strengthened.

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*



TO CONCLUDE

WHY AND HOW?

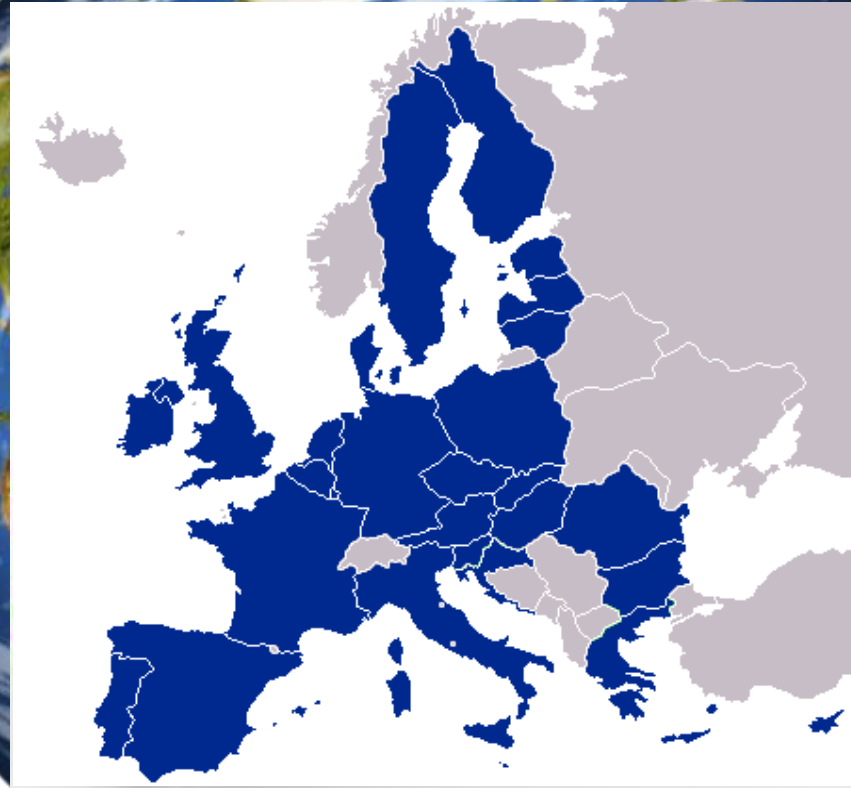
IMPORTANT MESSAGES TO REMEMBER

- *The existing global resource use trends and their environmental and health impact are extremely worrying and can/should not continue.*
- *Circular economy based on the concept of decoupling is an essential ingredient of an economy, which would be SDG compliant.*
- *If appropriate policies, including resource efficiency, are applied, we can reduce social differences, efficiently fight against climate change, biodiversity loss and pollution, while economic growth would be even higher than in the case that the current trends would continue.*
- *Circular Economy and bio-economy solutions are an important part of the answers to climate change challenges and biodiversity loss.*
- *Bio-economy has a major role to play, but it is essential that, like the rest of the economy, respects the sustainability criteria.*



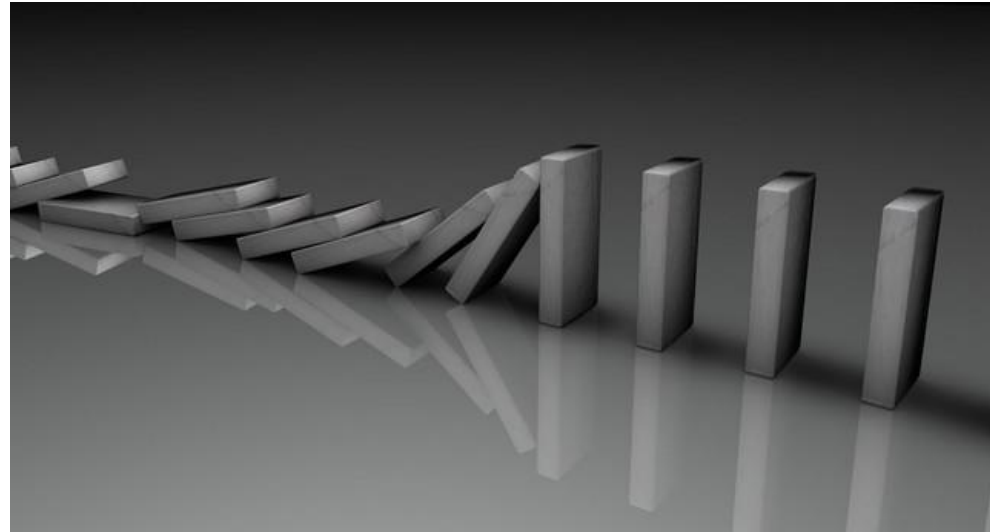
- *The challenge seems to not be one of not inadequate scientific evidence anymore; rather it is one of **cooperation and implementation**.*
- ***Complexity and scale of these challenges requires** a space that allows actors with responsibility for those environmental governance mechanisms to be able 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 owing sovereignty

Transition to a more sustainable economy and society



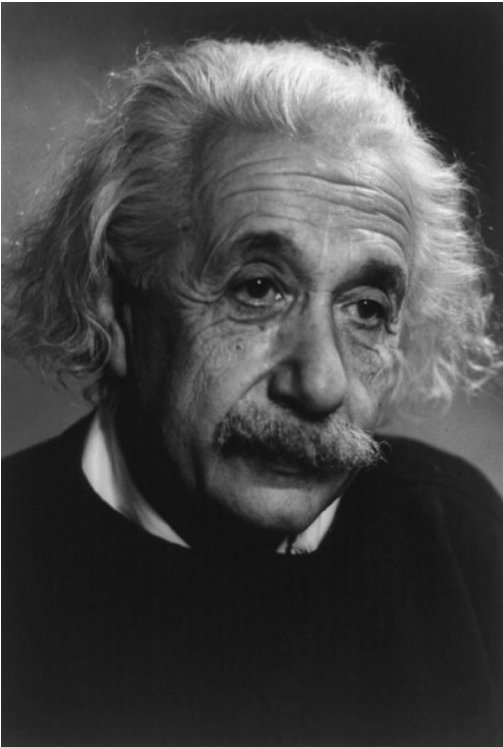
IS UNAVOIDABLE!

*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!
- Markets are core mechanism for the interaction among economic actors, producers and consumers. Production capital is over-valued and over-rewarded, labour capital is undervalued and under-rewarded and natural capital is in many cases not valued at all. This cannot lead to economic, social and environmental balance. **Signals to economic actors** should change.
- **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.

And in the BIOEAST region?



- *Identify the needs of the region*
- *Connect stakeholders and policies related to agriculture, environment and research*
- *Establish partnerships and link them to the identified Horizon thematic groups*
- *Don't wait for answers to come from others but rather pull the strengths together and make a difference*



“North Star” guiding our policies and behaviour

INTER-GENERATIONAL AGREEMENT

Design Sustainable Journey with (and for) the Future Generations

Circular Economy is not a new concept



It is the oldest concept on the earth.

Nature is a bio-economy organized on the principles of the circular economy.

Nothing is lost and everything has its purpose.

It make 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 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.



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/>