Environment and climate challenges are linked to broader sustainability issues

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Presentation overview

The need for systemic approach in achieving fundamental change in Europe's core consumption-production systems

- To secure long term policy outcomes
- To support sustainable development

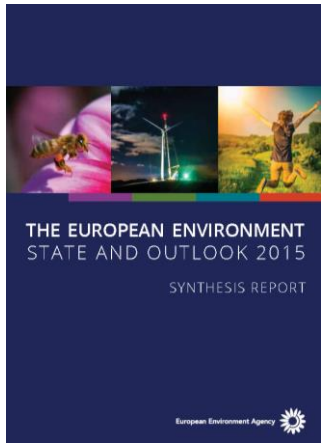
Complexity of environmental problems-systemic challenges

- Global interlinkages
- System interlinkages

Governance challenges

- Coordination across sectors and scales
- Indivisible SDG framework is systemic in nature

The need for fundamental change in Europe's core consumption-production systems



Based on a detailed analysis of the European environment's state, trends and outlook, including an assessment of global megatrends, SOER 2015 concluded that **the <u>mid- and long-term outlook</u> for Europe's environment in coming decades is worrying**

Achieving the EU's 2050 vision of "living well, within the planet's ecological limits", will require "**<u>fundamental transitions</u>**, entailing profound changes in dominant institutions, practices, technologies, policies, lifestyles and thinking."

Environmental Indicator Report 2017- trends

Priority objective 2: 'to turn the Union into a resource-efficient, green, and competitive low-carbon economy', 2017 results

Resource productivity	▲	●
Waste generation in Europe	▲	●
Recycling of municipal waste	▲	●
Use of freshwater resources	▲	●
Total greenhouse gas emission trends and projections	▲	●
Share of renewable energy in gross final energy consumption	▲	●
Progress on energy efficiency in Europe	▲	●
Energy consumption by households	▲	●
Greenhouse gas emissions from transport	▲	●
Animal product consumption (animal protein)	▲	●
Share of environmental and labour taxes in total tax	▲	●
	▲	●
	▲	●

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Priority objective 1: 'to protect, conserve and enhance the Union's natural capital', 2017 results

	EU indicator past trend	Outlook of the EU meeting the selected objective by 2020
Exposure of terrestrial ecosystems to eutrophication due to air pollution	▲	●
Gross nutrient balance in agricultural land: nitrogen	▲	●
Land take	▲	●
Forest: growing stock, increment and fellings	▲	●
Status of marine fish stocks	▲	●
Abundance and distribution of selected species (common birds and grassland butterflies)	▲	●
Species of European interest	▲	●
Habitats of European interest	▲	●
Status of surface waters	N.A.	●

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Priority objective 3: 'to safeguard the Union's citizens from environment-related pressures and risks to health and well-being'

	EU indicator past trend	Outlook of the EU meeting the selected objective by 2020
Exceedance of air quality limit values in urban areas (nitrogen dioxide: NO_2; dust particles: PM_{10}; ozone: O_3; fine particulate matter: $PM_{2.5}$)	▲ NO_2, PM_{10}, $PM_{2.5}$ ▲ O_3	●
Emissions of the main air pollutants in Europe (sulphur oxides: SO_2; nitrogen oxides: NO_X; ammonia: NH_3; non-methane volatile organic compounds: NMVOCs; fine particulate matter: $PM_{2.5}$)	▲ SO_2, NO_X, NMVOCs, $PM_{2.5}$ ▲ NH_3	● SO_2, NO_X, NMVOCs, $PM_{2.5}$ ● NH_3
Bathing water quality	▲	●
Number of countries that have adopted a climate change adaptation strategy and/or plan	N.A.	●
Exposure to environmental noise	▲	●
Consumption of chemicals, by hazard class	▲	●
Total sales of pesticides	▲	●

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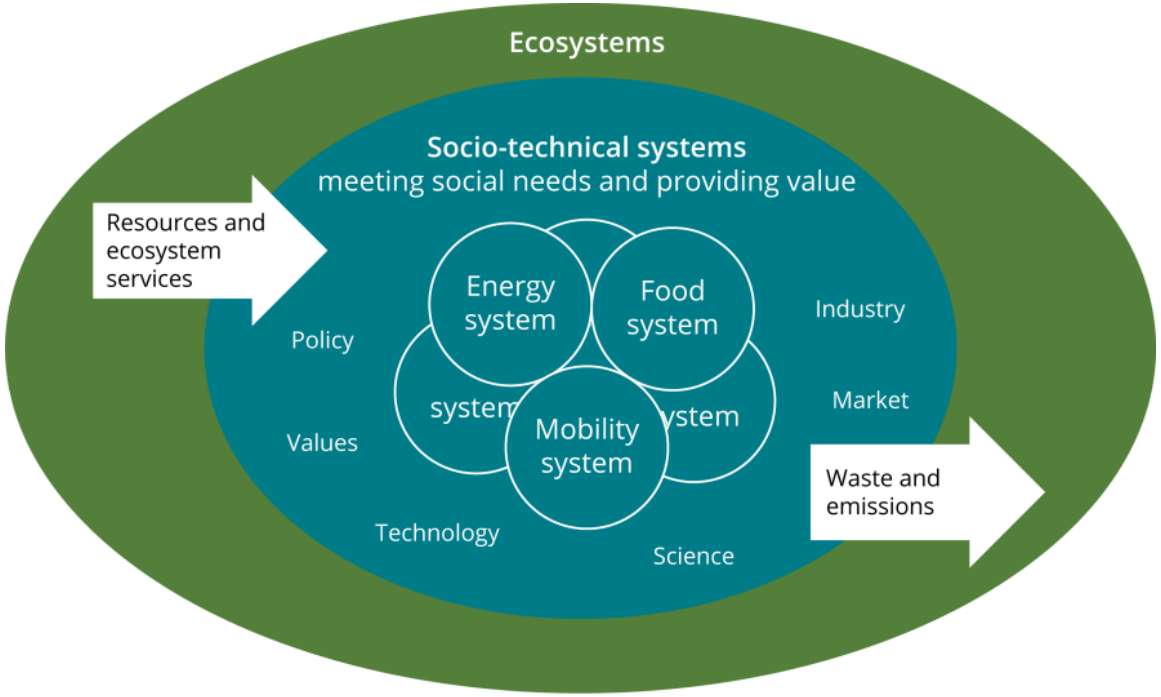
Complexity of environmental problems

1. Interdependences with global developments
2. Systemic characteristics of environmental challenges



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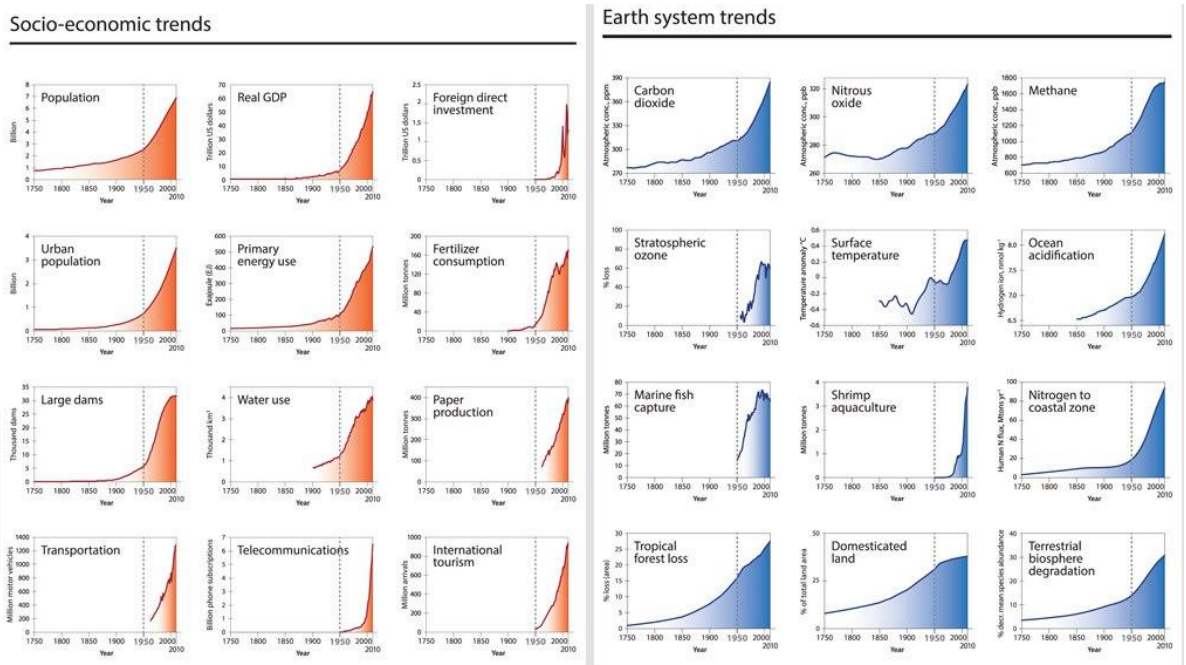
Systemic challenge - global interlinkages

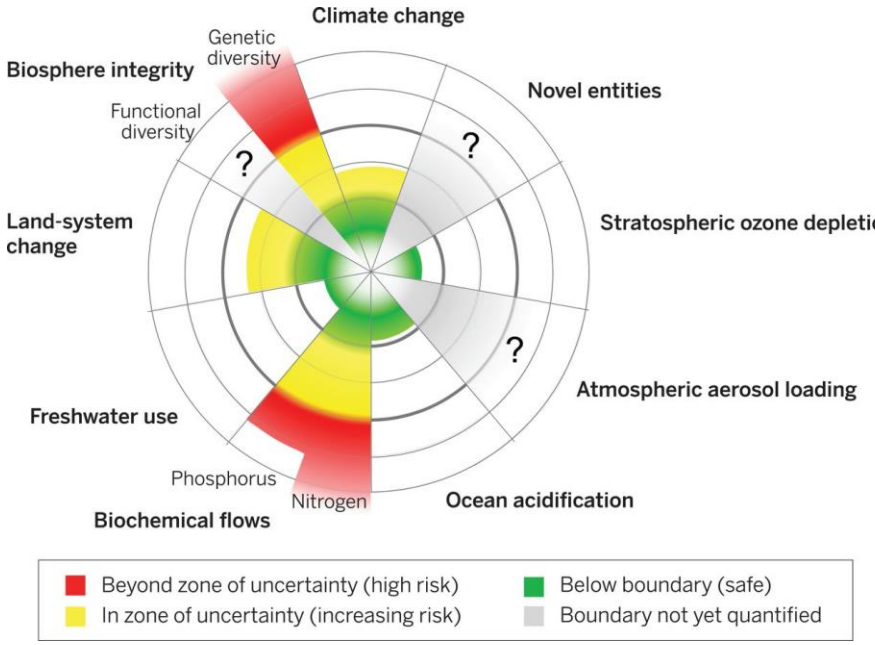
Globalisation

Acceleration



Food (+ 70% meat by 2050)
Energy (+30-40% in 20 years)
Raw materials (+100% by 2030)
Ecosystem depletion (10-40% loss by 2050)

Limits of the planet



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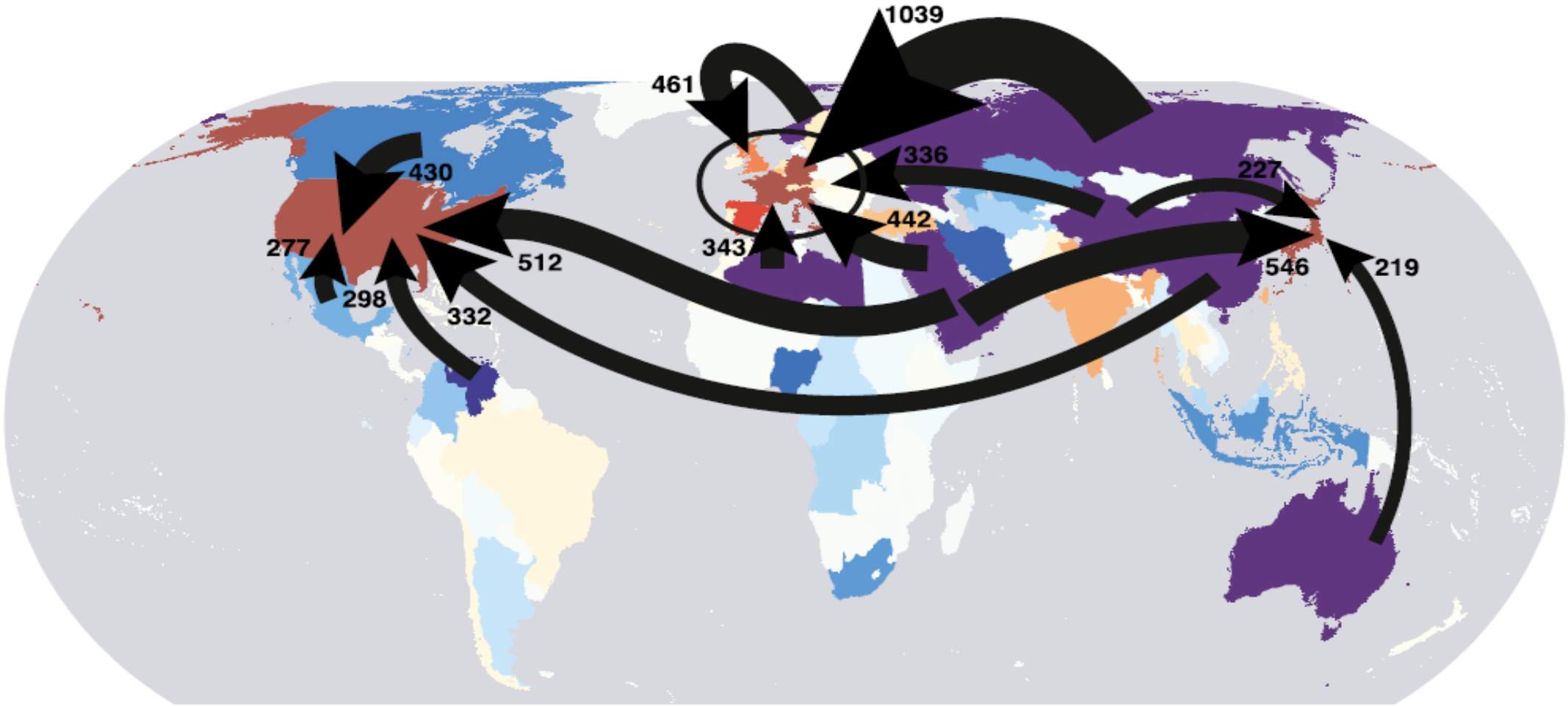
Global interlinkages - trade

e.g. **Emissions embodied in trade**



Davis et al., 2011 – CO_2 net import/export

Systemic environmental challenges

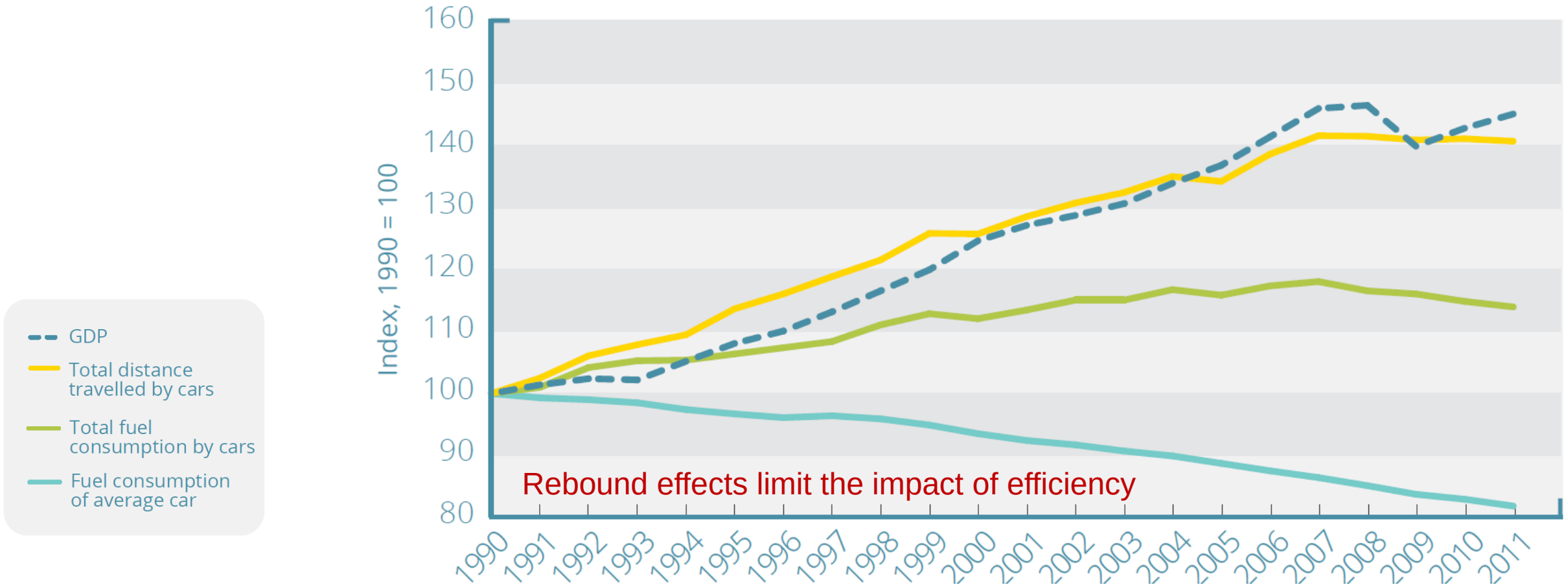
Due to systemic nature of environmental challenges efforts to solve one may create **unintended consequences** for others.

Examples:

- Bioenergy as a substitute for fossil fuels impacts land use (eg. food), biodiversity, ES functioning, water, nutrient and carbon cycle and can even increase GHG emissions
- Organic agriculture can have many positive impacts on biodiversity and ecosystems, but it can reduce yields and cause increasing imports

Systemic challenges – illustration from transport system

Transport activity and its impacts to environment are **projected to grow** further across Europe and the EU's **share of renewable energy in transport rose lower** than what is required according to the target path.



Link between transport and energy system

Electric vehicles can significantly reduce the adverse environmental effects of conventional passenger vehicles, **as long as the electricity is from renewable sources.**

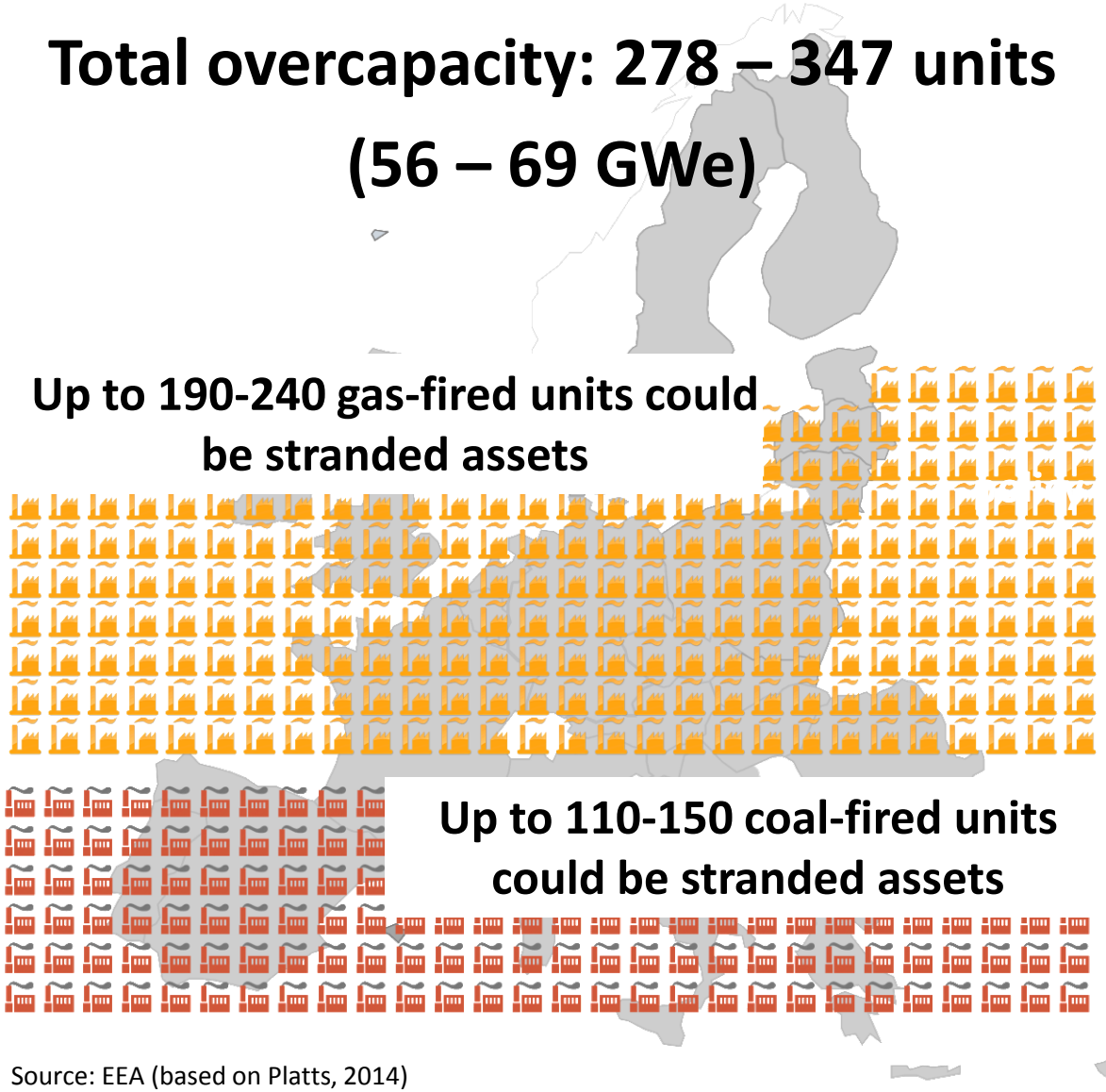
Outcome is dependent on the adjusted energy system.

Is energy system ready for such an innovation change?

Carbon lock-in in the EU power sector

Total overcapacity: 278 – 347 units

(56 – 69 GWe)



Source: EEA (based on Platts, 2014)

If existing and planned units were operated according to extended lifetimes…

1/3 of the capacity of all coal-fired and gas-fired units would be **in excess in 2030**, and thus at risk of becoming stranded in comparison with optimal capacity defined by **Energy Roadmap 2030**

Decarbonisation of the energy sector is challenged, also electrical car system.

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Governance challenges: Policy mixes for systemic change

Directionality, credibility
- Visions and pathways
- Long-term targets
- Scale and speed
- Foresight

Environment and sectoral policies, e.g.
- Carbon pricing
- Strict regulation
- Removing barriers (e.g. subsidies)

Overcoming silos

Interlinkages with global decision making processes

Coordination across sectors, scales
- Policy coherence and consistency
- Mission-oriented innovation
- Polycentric governance
- Stakeholder platforms, networks

Welfare, education policies
- Compensating losers
- Offsetting inequities
- Retraining

Innovation policies, e.g.
- R&D
- Experiments
- Network building
- New entrant support

Industrial policy, e.g.
- Specific visions
- Market creation
- Adoption subsidies
- Backing winners

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A central role for SDGs at EU level

- The **international agreement on SDGs** has been successful in bringing countries together towards common targets for 2030

- The **links between SDGs** could be a way to address systemic challenges more effectively in the EU context

Governance challenges - SDG interactions

Acknowledging systemic SDG interactions can help:

- To foster progress on priority targets
- To release synergetic effects
- To identify rippling effects – cascading synergetic effects

Thank you

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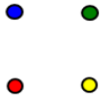
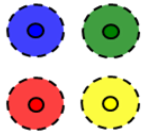
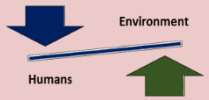
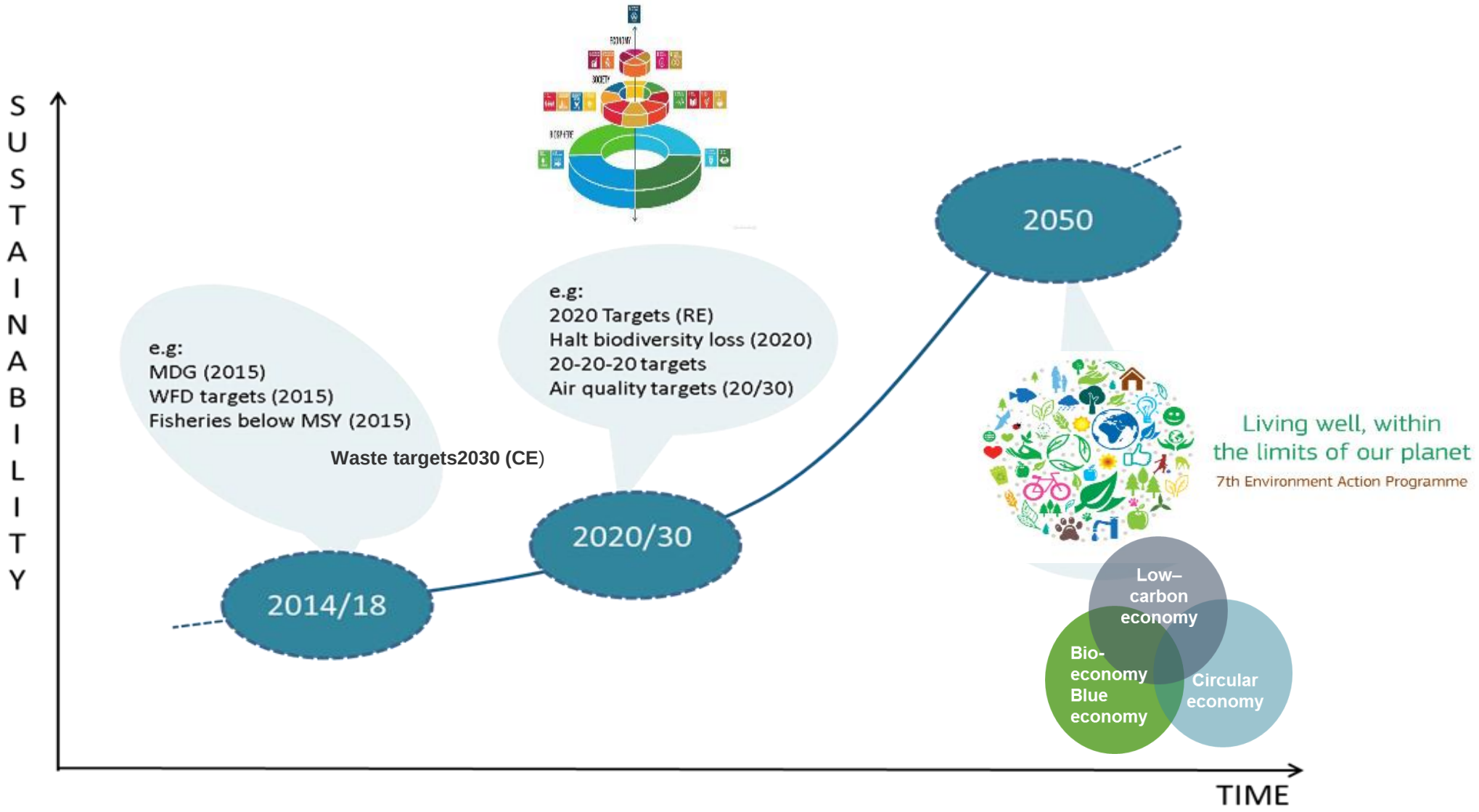
Changing nature of environmental challenges

SOER 2020

Characterisation of key challenges	Key features	In the spotlight in	Policy approaches (examples)	Assessment approaches and tools (examples)
Specific 	linear cause-effect large (point) sources often local	1970s / 1980s (continuing today)	targeted policies and single-issue instruments	datasets, indicators
Diffuse 	cumulative causes multiple sources often regional	1980s / 1990s (continuing today)	policy integration and raising public awareness	DPSIR data sets, indicators, environmental accounts, outlooks
Systemic 	systemic causes interlinked sources often global	1990s / 2000s (continuing today)	policy coherence and systemic approaches (e.g. green economy)	DPSIR, STEEP indicators and accounts, systems analysis, foresight, stakeholder participation
Sustainability 	Vulnerable, Uncertain, Complex, Ambiguous (VUCA), long term, open, inclusive	1990s …. (increasingly acknowledged today)	Open governance, Participative Innovation Experimentation	Systemic, forward-looking Response oriented Collaborative Better regulation toolbox

1 More long-term policy landscape



Source: EEA Multi-Annual Work Programme 2014 to 2018

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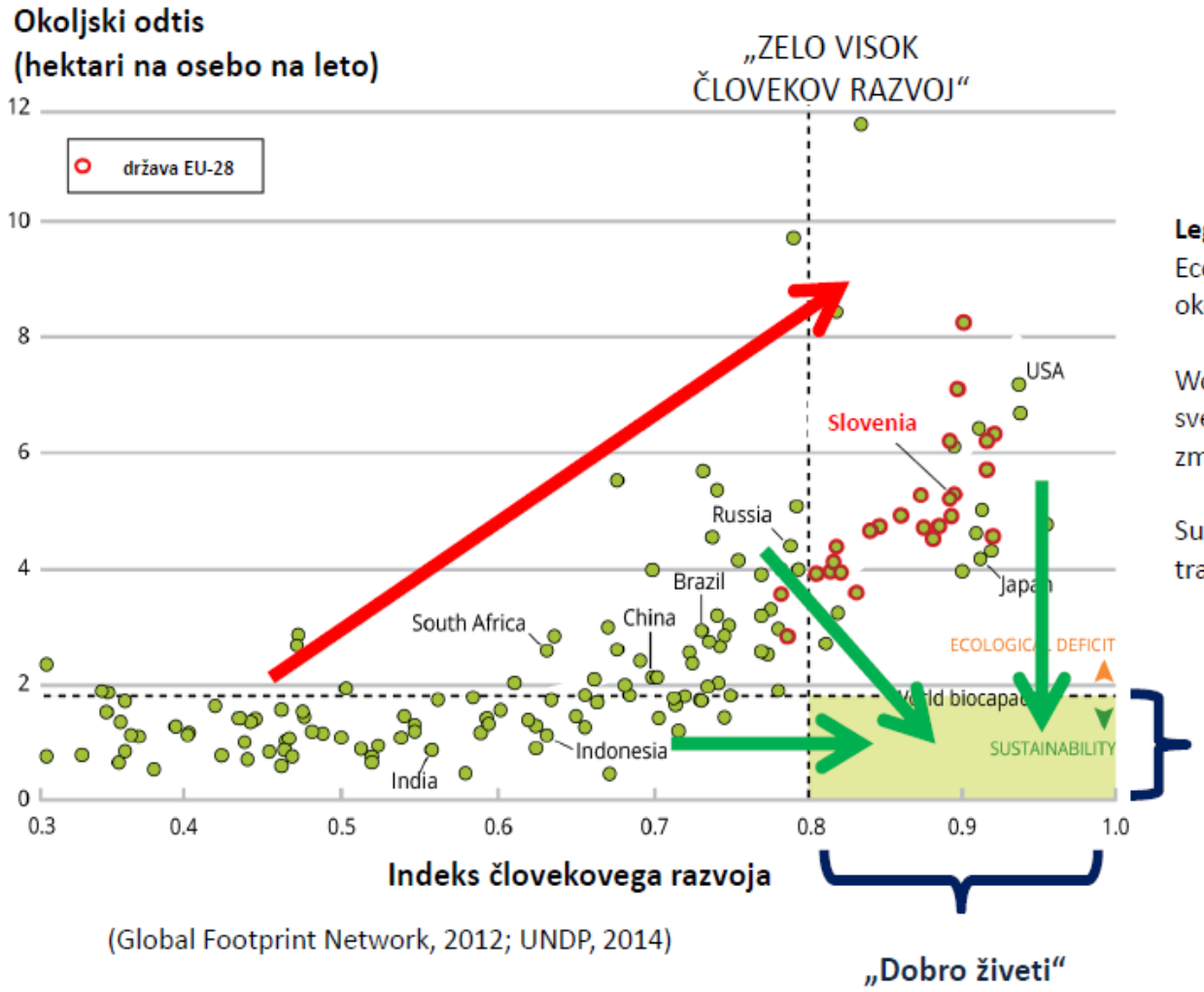
Challenge of the 21 century: 10 billion people, one planet

Ključni izziv 21. stoletja



(Global Footprint Network, 2012; UNDP, 2014)

Legenda:
Ecological deficit = okoljski primanjkljaj

World biocapacity = svetovna biološka zmogljivost

Sustainability = trajnostnost

Znotraj okoljskih meja

Carbon, water, land and material footprint

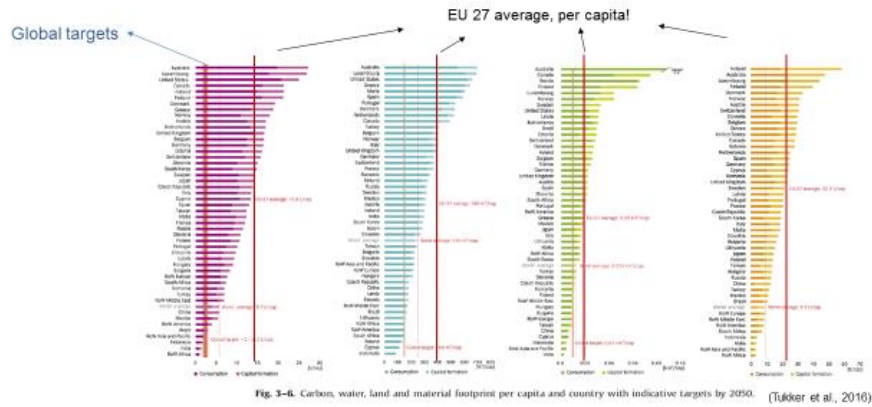


Fig. 3–6. Carbon, water, land and material footprint per capita and country with indicative targets by 2050. (Tukker et al., 2016)