From environmental policy to systemic sustainability transitions: credible approaches for the 21st century

11th International Scientific Conference on Energy and Climate Change, Athens
Dr Hans Bruyninckx, 12 October, 2018

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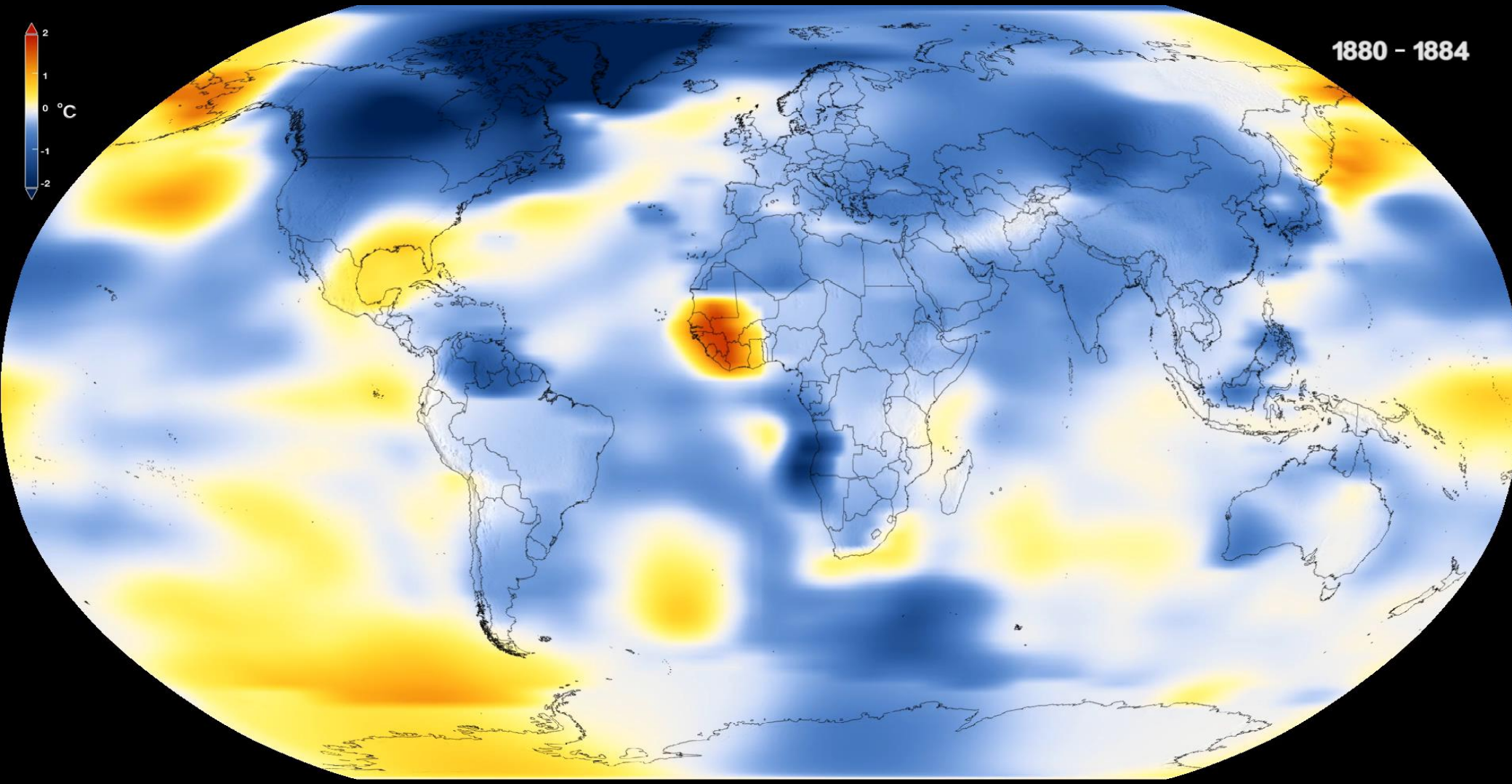
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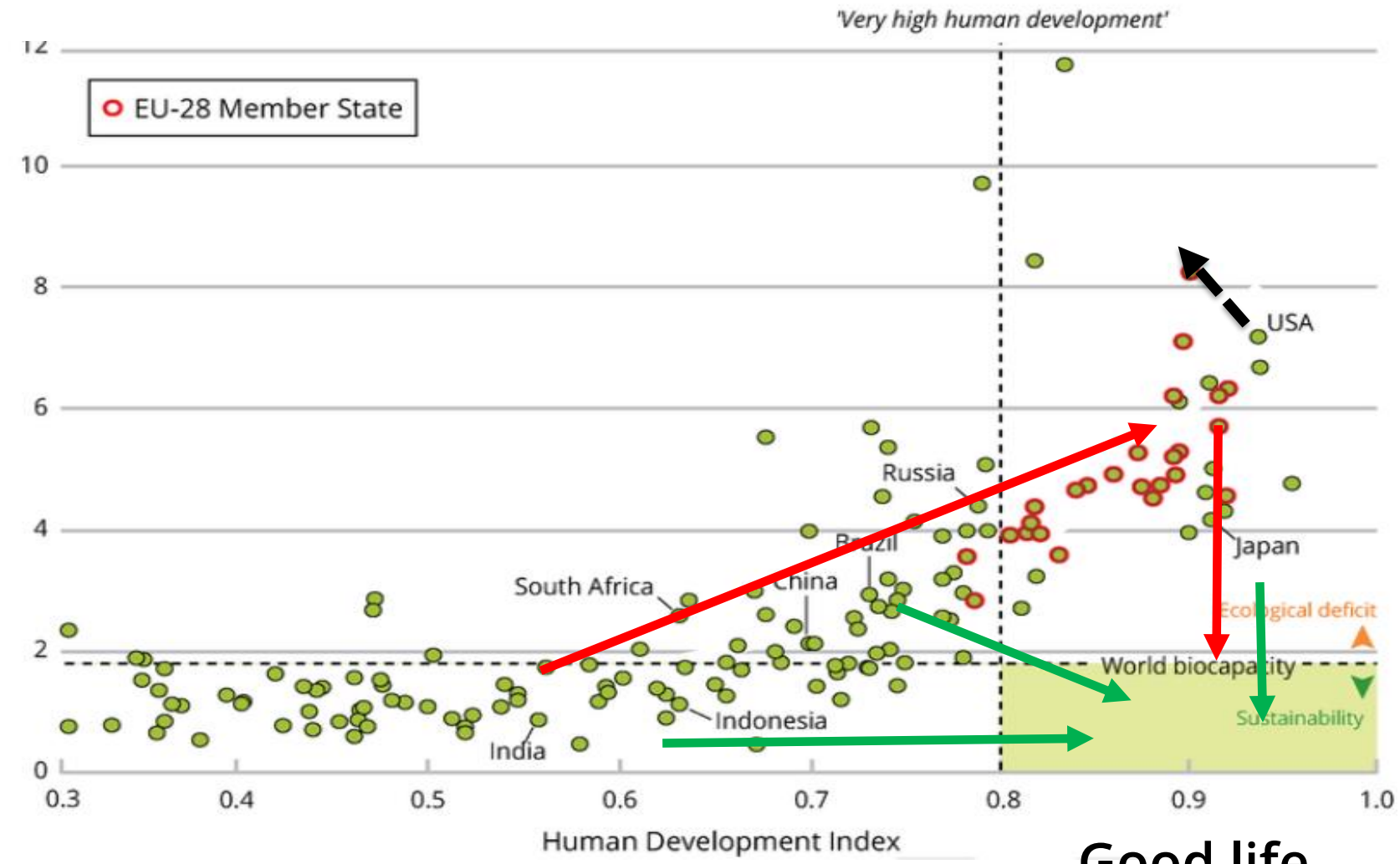
1880 – 1884

Challenge of 21st century: 10 billion people, 1



Water, forests, oceans, biodiversity climate, resources

Within limits of the planet

Good life

Education, health, food, housing, safety

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(Global Footprint Network, 2012; UNDP, 2014)

Global response: Sustainable Development Goals

EU Policy framework – 7th Environment Action Programme

Living well, within the limits of our planet

7th Environment Action Programme

European Environment Agency

Vision of the 7th Environment Action Programme

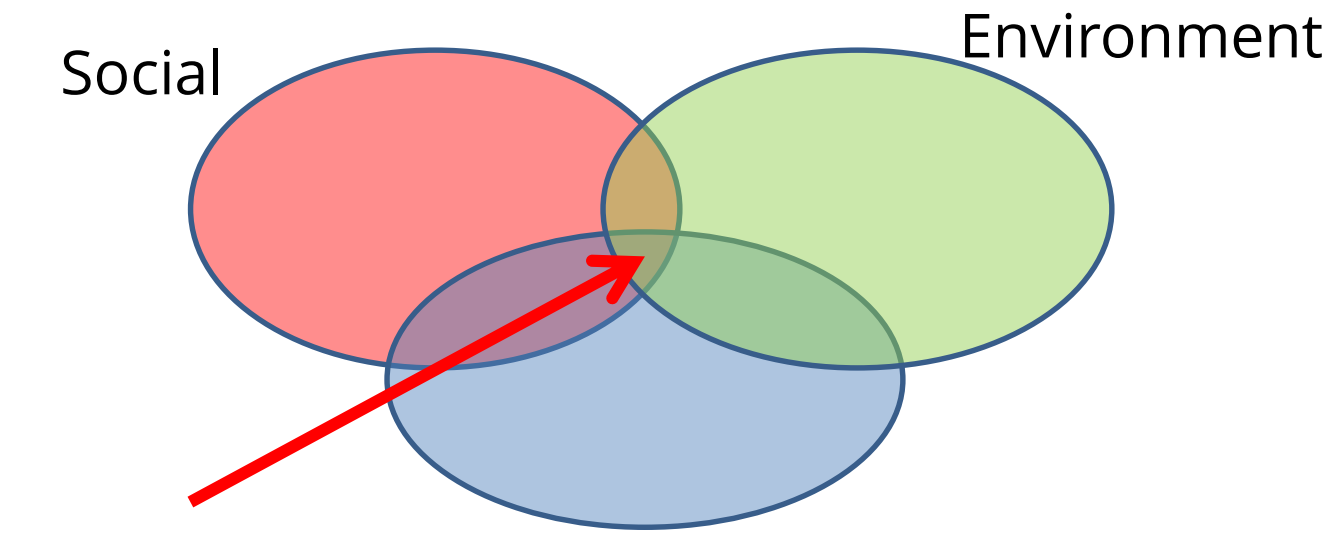
‘In 2050, we live well, within the planet's ecological limits.

Our prosperity and healthy environment stem from an innovative, **circular economy** where nothing is wasted and where natural resources are managed sustainably, and **biodiversity is protected**, valued and restored in ways that enhance our society's resilience.

Our **low-carbon growth** has long been decoupled from resource use, setting the pace for a global safe and sustainable society.’

Source: 7th Environment Action Programme, European Commission, 2013

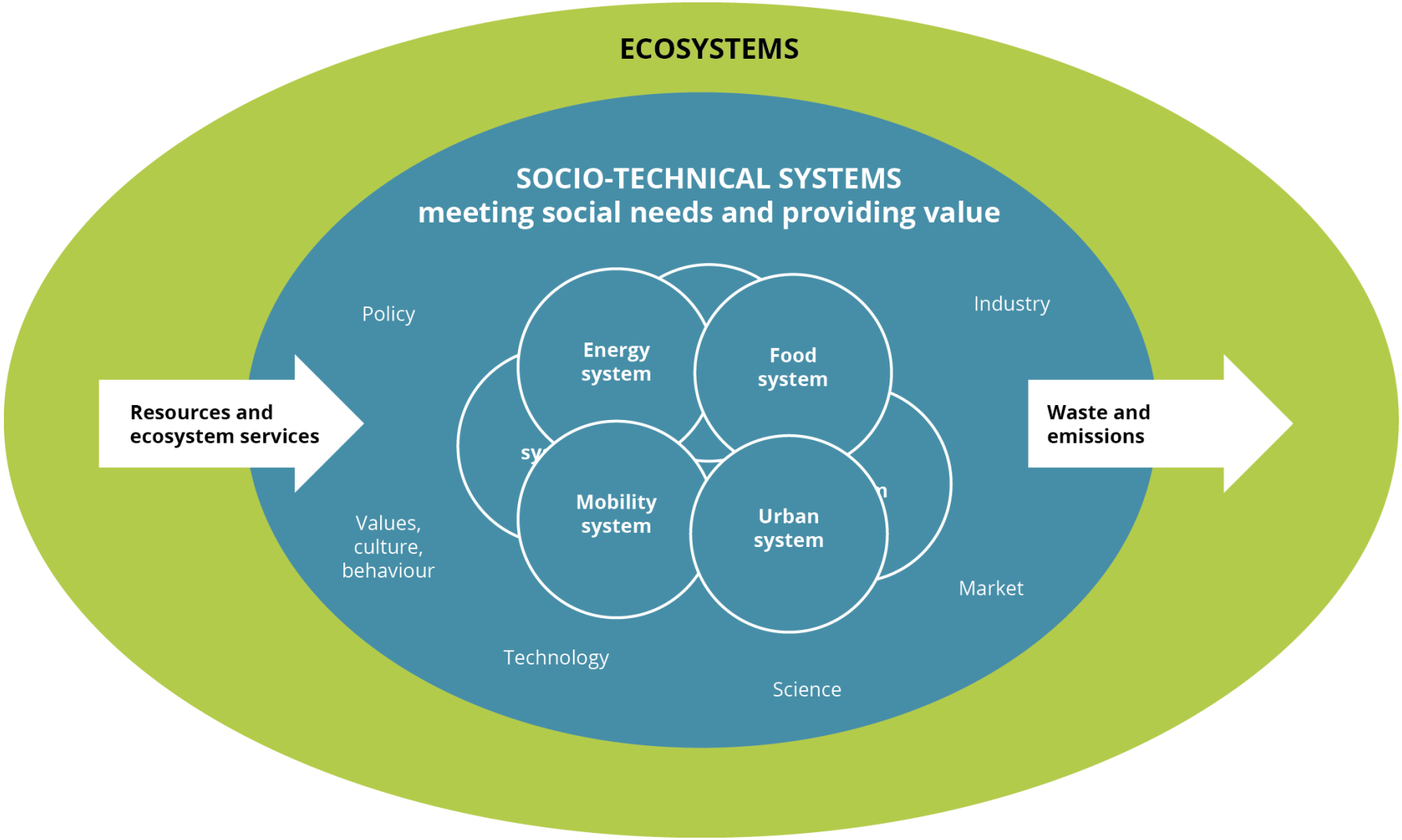
Rethinking « sustainable development »?



Sustainable development ?

Of course not!

Natural capital as explicit boundary condition



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Implicit order in the SDGs

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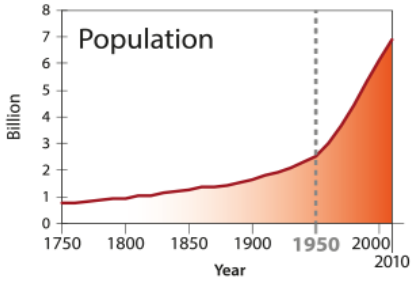
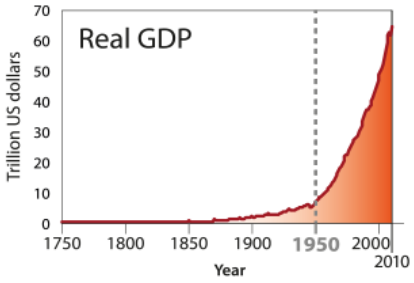
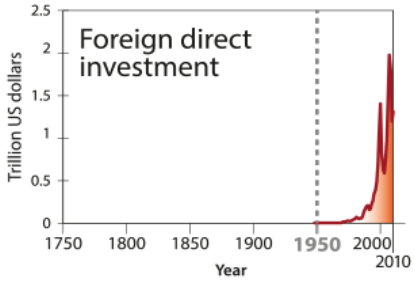
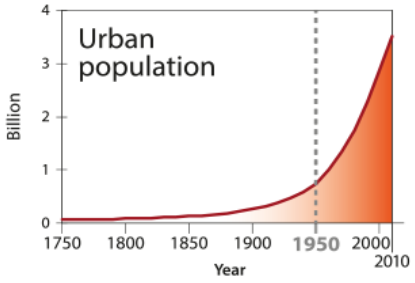
Global trends1

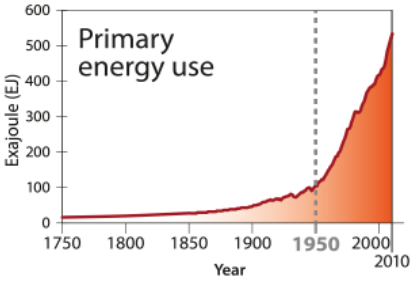
Socio-economic trends

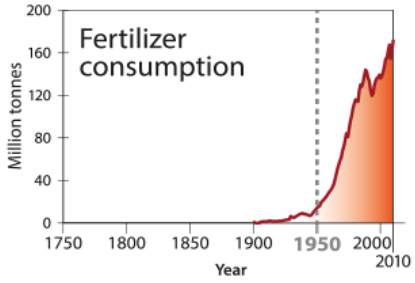


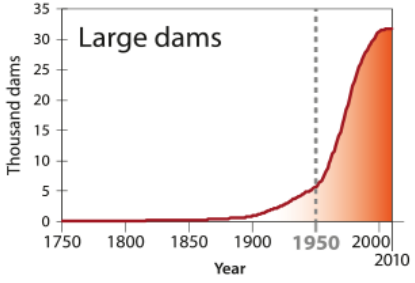


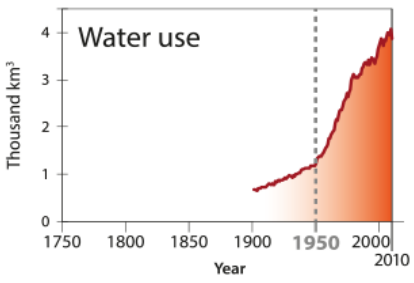


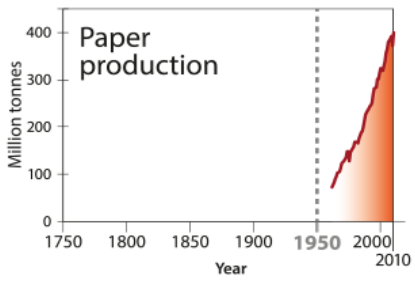


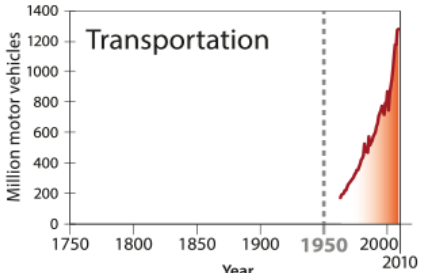


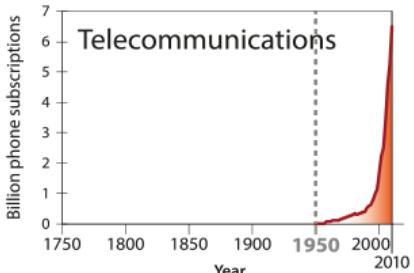


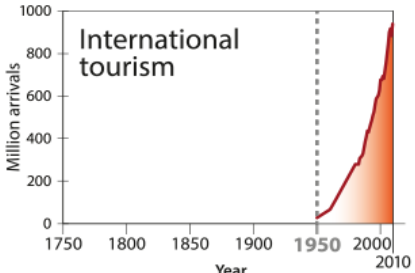












Globalisation of unsustainable systems of production and consumption

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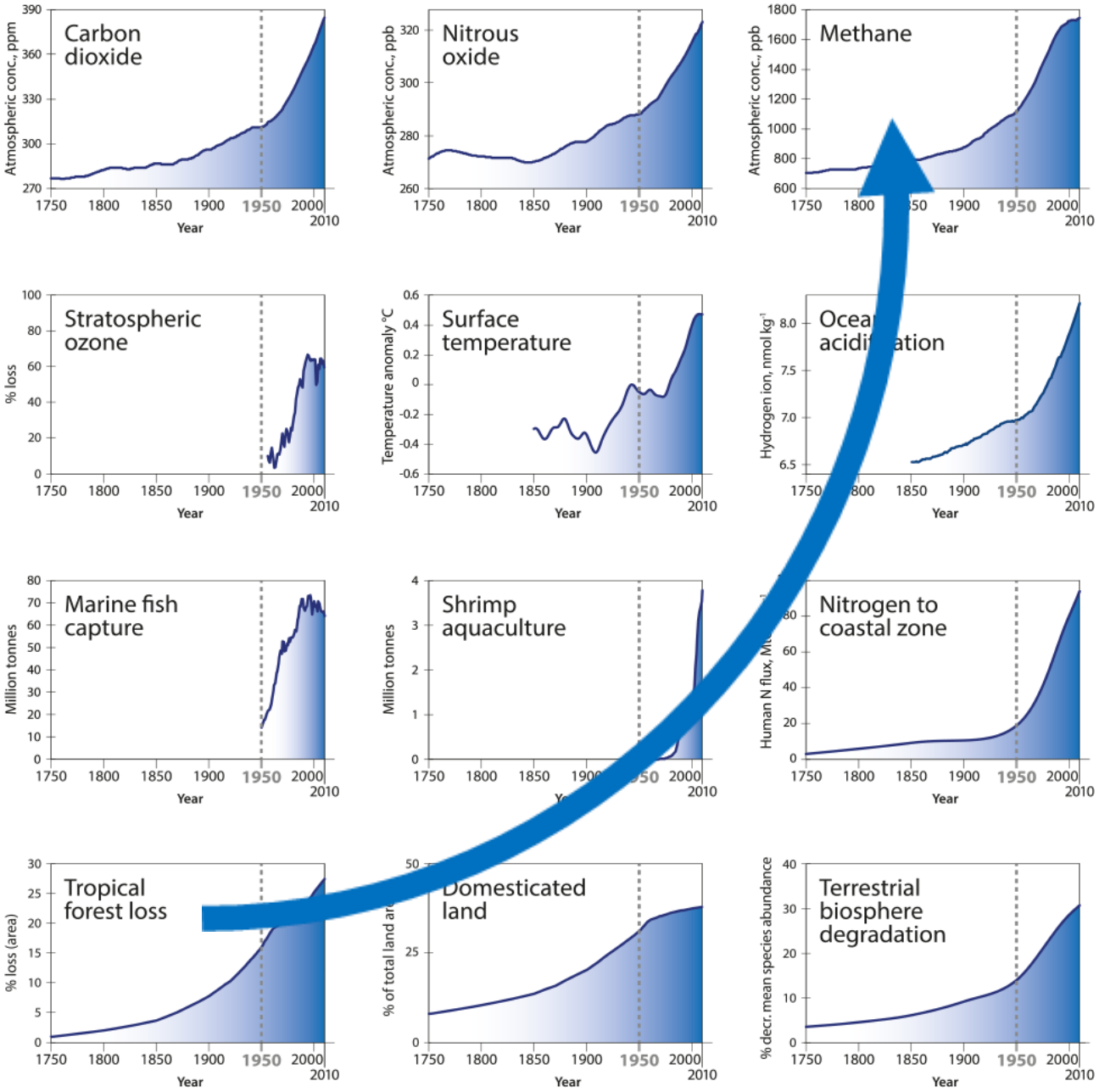
Earth system trends



Global trends2

Expectations/ policy promises

OR

How credible?
How feasible?
What sort of policies and knowledge?

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This could be our best century ever, or our worst

Dr James Martin, founder Oxford Martin School

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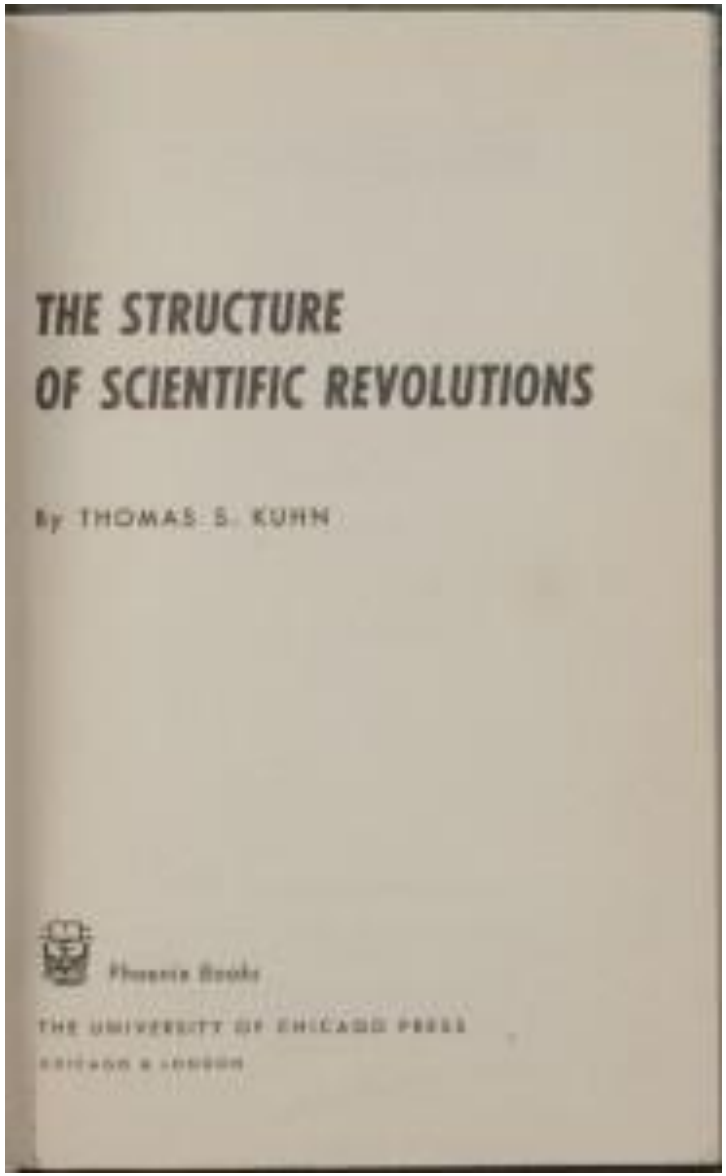
Paradigm shift in knowledge and



Normal Science
Puzzle solving stage
Scientists share common paradigm
-make measurements
-articulate theory
-make predictions

Anomaly
Blame apparatus
Set aside problem
Modify paradigm

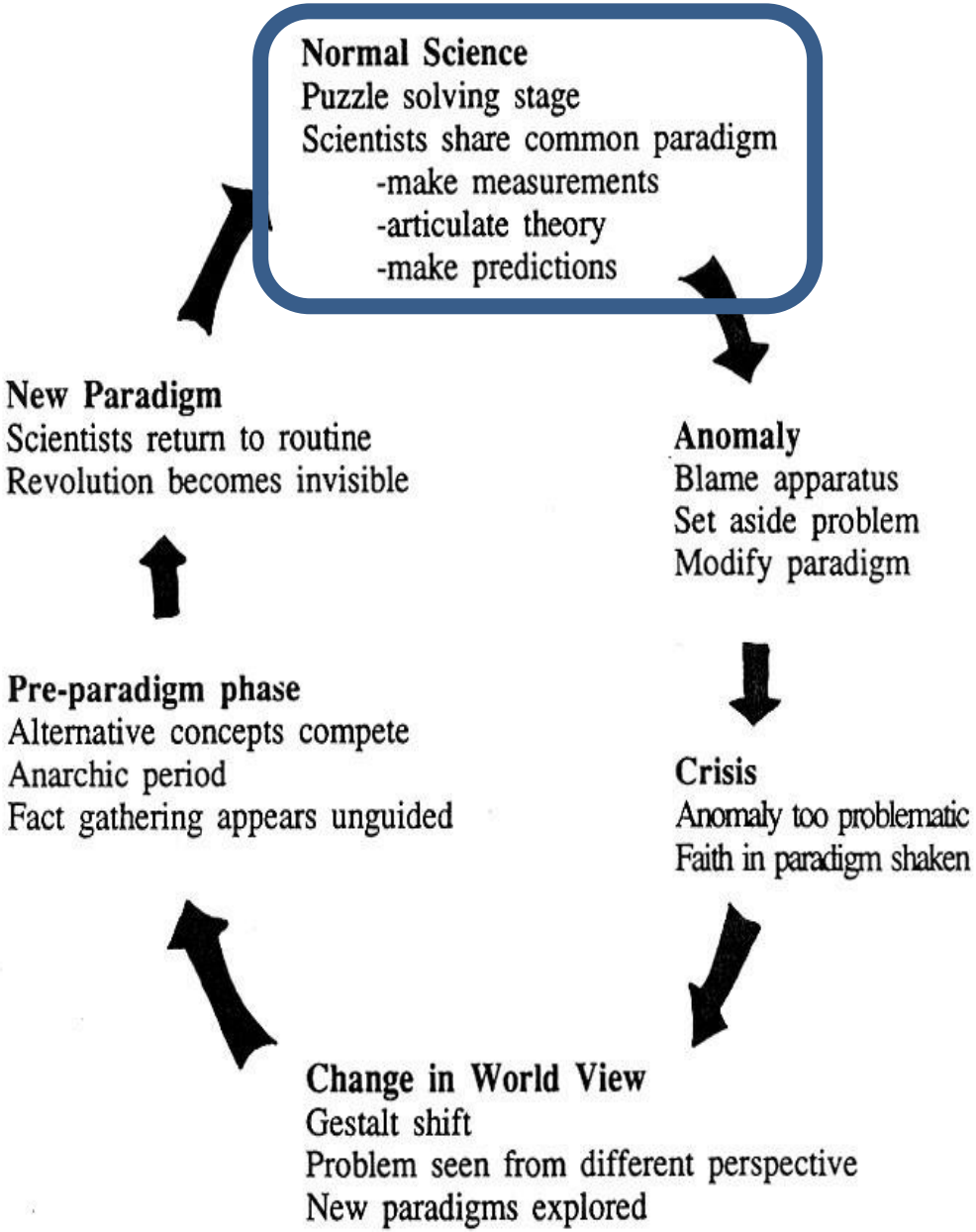
Crisis
Anomaly too problematic
Faith in paradigm shaken

Change in World View
Gestalt shift
Problem seen from different perspective
New paradigms explored

Pre-paradigm phase
Alternative concepts compete
Anarchic period
Fact gathering appears unguided

New Paradigm
Scientists return to routine
Revolution becomes invisible

Normal

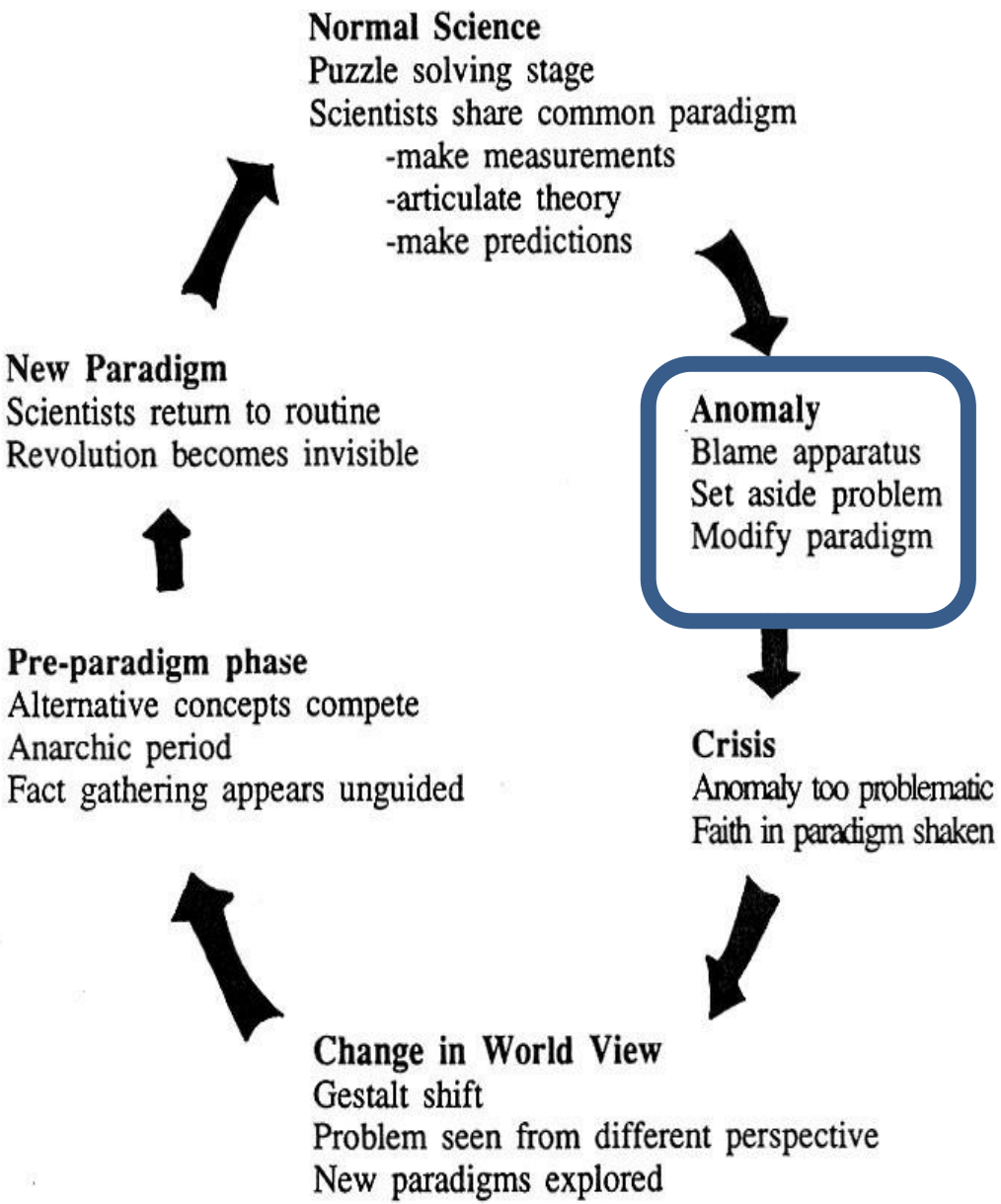


"Over the past 40 years, a broad range of environment legislation has been put in place, amounting to the most comprehensive modern standards in the world. This has helped to address some of the most serious environmental concerns." (7EAP)

Policy theory: initially 'fighting pollution'

Knowledge paradigm: "Union environment policy is based on environmental monitoring, data, indicators and assessments linked to the implementation of Union legislation, as well as formal scientific research…." (7EAP)

Anomalies occur



"However, many environmental trends in the Union continue to be a cause for concern, not least due to insufficient implementation of existing Union environment legislation." (7EAP)

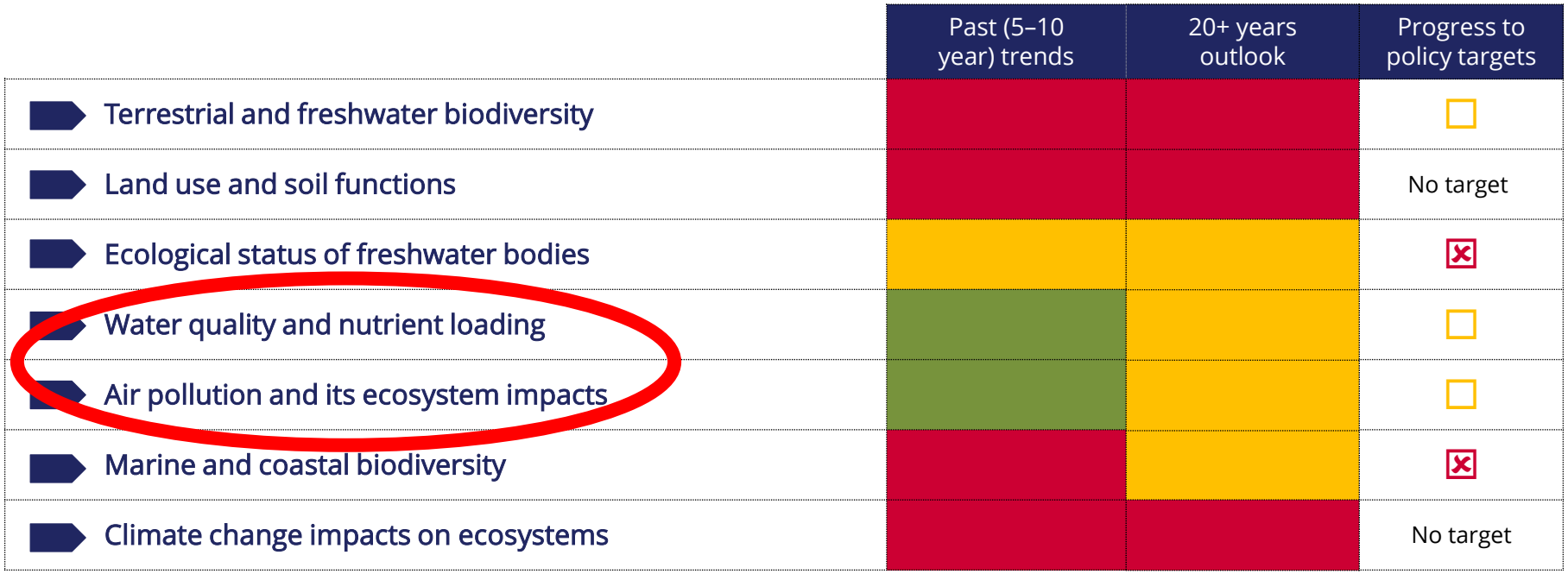
"Addressing some of those complex issues requires tapping into the full potential of existing environmental technology […], as well as increased use of market-based instruments." (7EAP)

Modify policy theory: Efficiency thinking

Modify knowledge: Efficiency; market-based instruments; BAT studies; voluntary instruments

Thematic priority objective 1:
Protecting, conserving and enhancing natural capital

SYNTHESIS REPORT | GLOBAL MEGATRENDS | EUROPEAN BRIEFINGS | COUNTRY COMPARISONS | COUNTRIES & REGIONS



Source: EEA. SOER 2015 Synthesis report.

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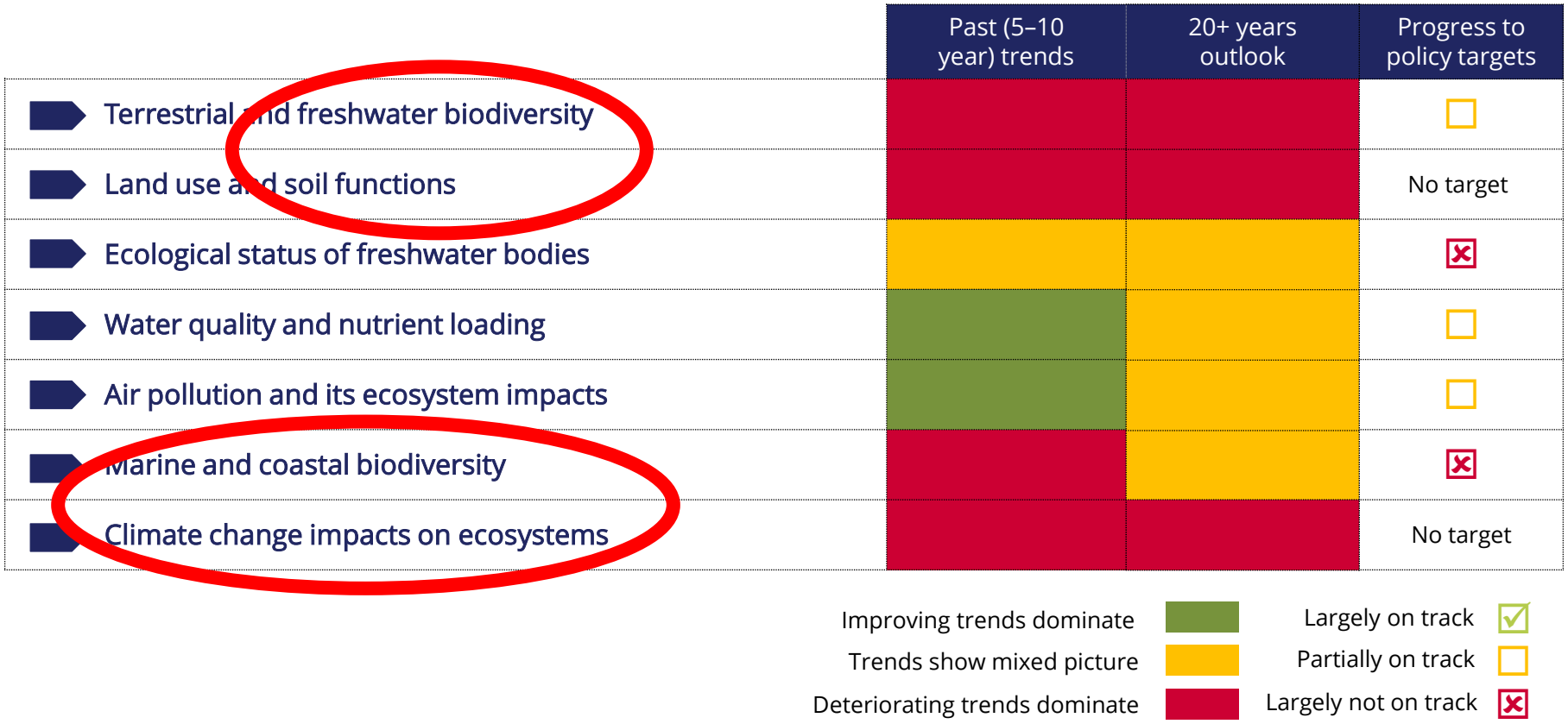

Source: EEA. SOER 2015 Synthesis report.

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Thematic priority objective 3: Safeguarding from environmental risks to health

SYNTHESIS REPORT | GLOBAL MEGATRENDS | EUROPEAN BRIEFINGS | COUNTRY COMPARISONS | COUNTRIES & REGIONS

	Past (5–10 year) trends	20+ years outlook	Progress to policy targets
Water pollution and related environmental health risks			☑ / ☐
Air pollution and related environmental health risks			☐
Noise pollution (especially in urban areas)		/	☐
Urban systems and grey infrastructure			No target
Climate change and related environmental health risks			No target
Chemicals and related environmental health risks			☐ / ☒

Improving trends dominate
Trends show mixed picture
Deteriorating trends dominate

Largely on track ☑
Partially on track ☐
Largely not on track ☒

Source: EEA. SOER 2015 Synthesis report.

Challenges for established governance approaches

Are they addressing the underlying drivers of environmental degradation?

In 2001, the EU set itself the target to halt biodiversity loss in the EU by 2010.

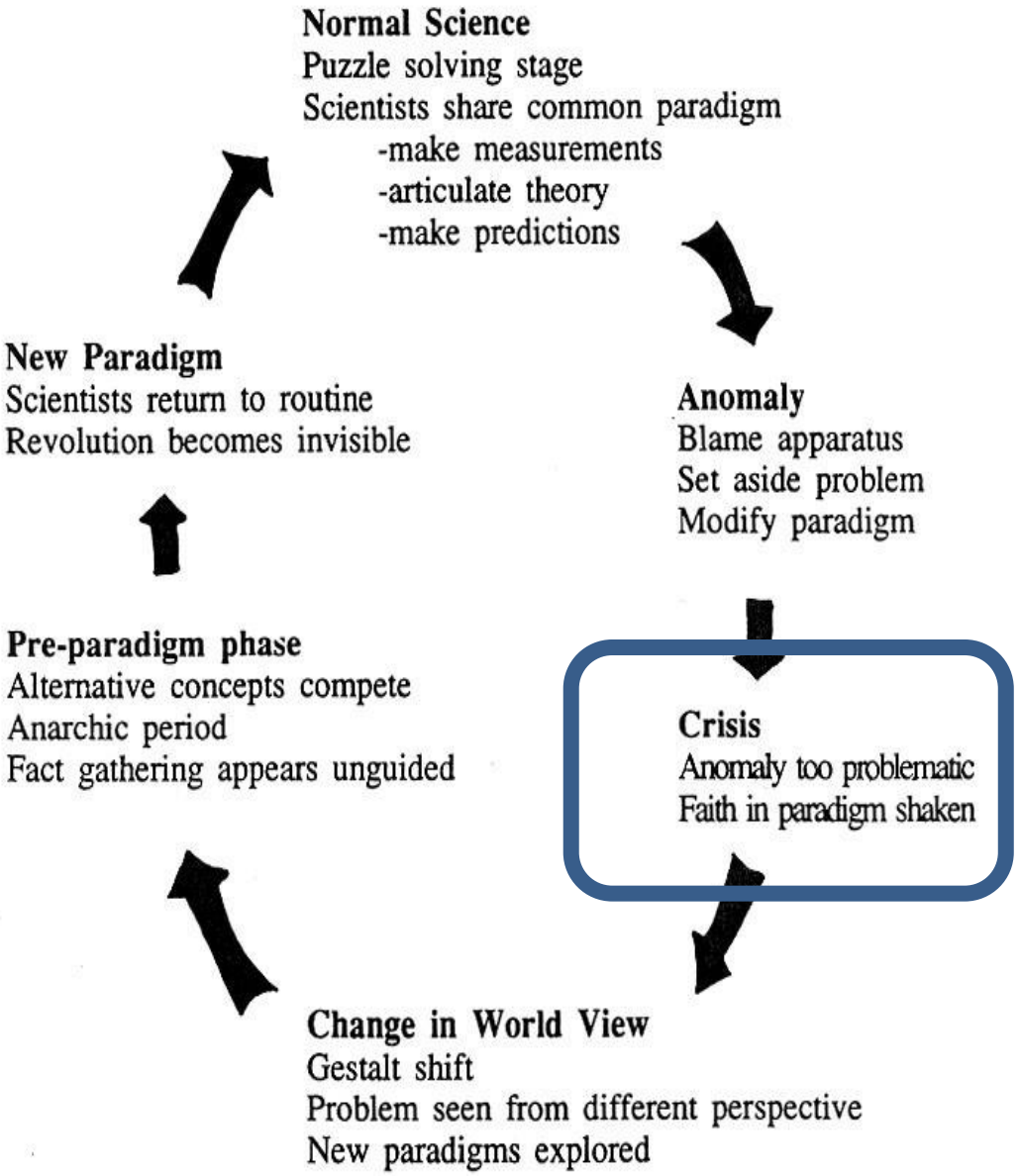
In 2011, the EU set the target to 'halt loss of biodiversity and degradation of ecosystem services in the EU by 2020'.

EU Biodiversity Targets (2020)	Progress at mid-term (201
2020 Headline Target	No significant pr
Halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restore them in so far as feasible, while stepping EU contribution to a global biodiversity los	Overall, bi EU system services in the eline, as confirmed by *Report*. This is consistent ons for the capacity of the future. While many local successes ground delivers positive outcomes, these up to have a measurable impact on the overall

Next? '2030'? Or, addressing the fundamental drivers?

Source: *Mid-term review of the EU biodiver*

Science/knowledge/policy in



"Together with current wasteful production and consumption systems in the world economy, […] depletion of resources […], generating more pollution and waste, increasing global GHG emissions and exacerbating land degradation, deforestation and biodiversity loss." (7EAP)

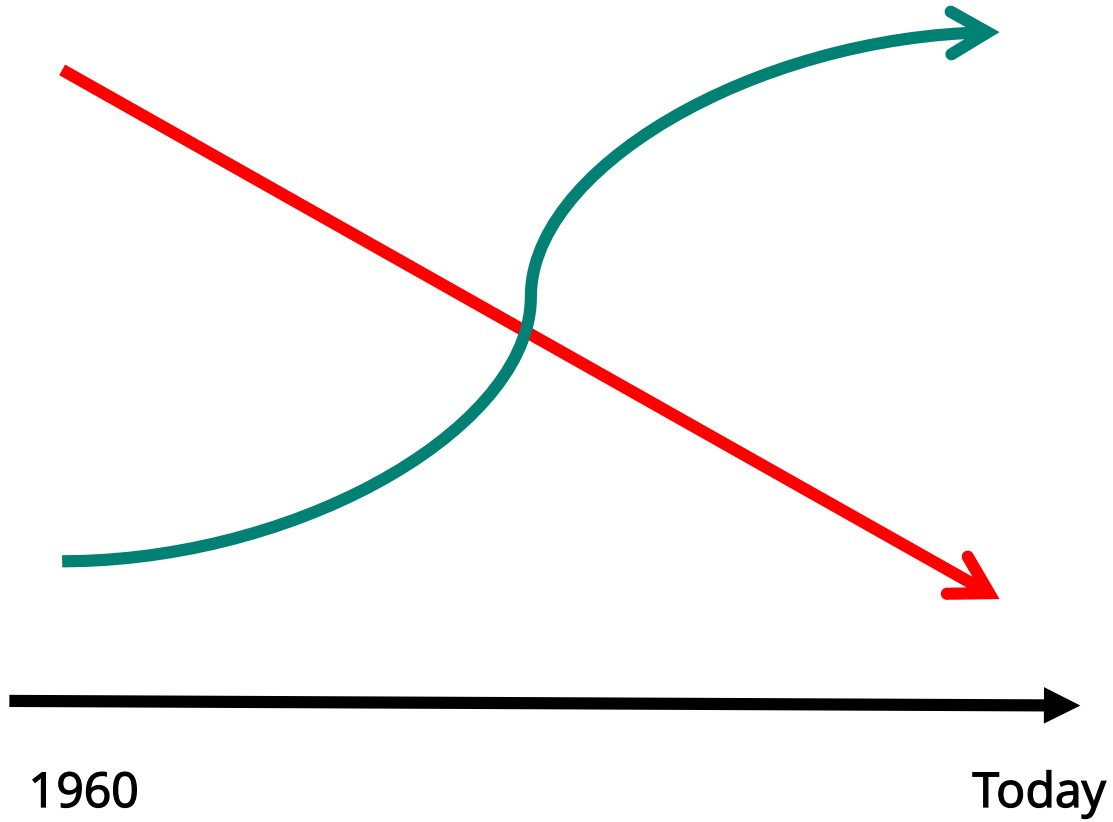
"This report has come to the conclusion that traditional incremental approaches based on the efficiency approach will not suffice. Rather, unsustainable systems of production and consumption require fundamental rethinking in the light of European and global realities." (SOER2015)

The overall picture:
Efficiency improvements have not secured long-term resilience

Source: EEA. SOER 2015 Synthesis report.

Core anomaly

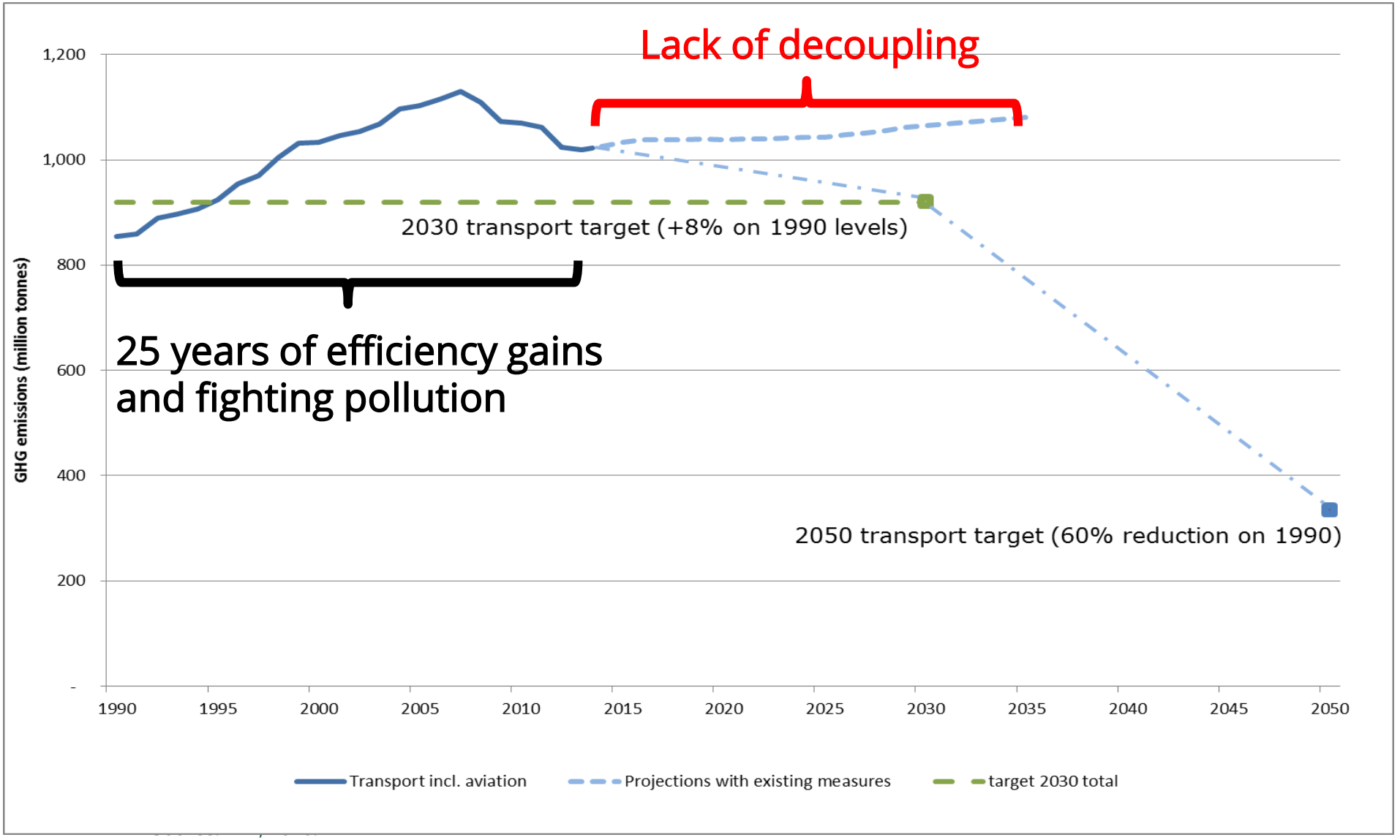
Institutional vs ecosystem developments



Different explanations:

- Counterfactual
- Implementation GAP
- Better regulation
- Time-lag effect
- **Institutional solutions don't address the core issues!**

EU GHG emissions from transport



Source: EEA, 2016.

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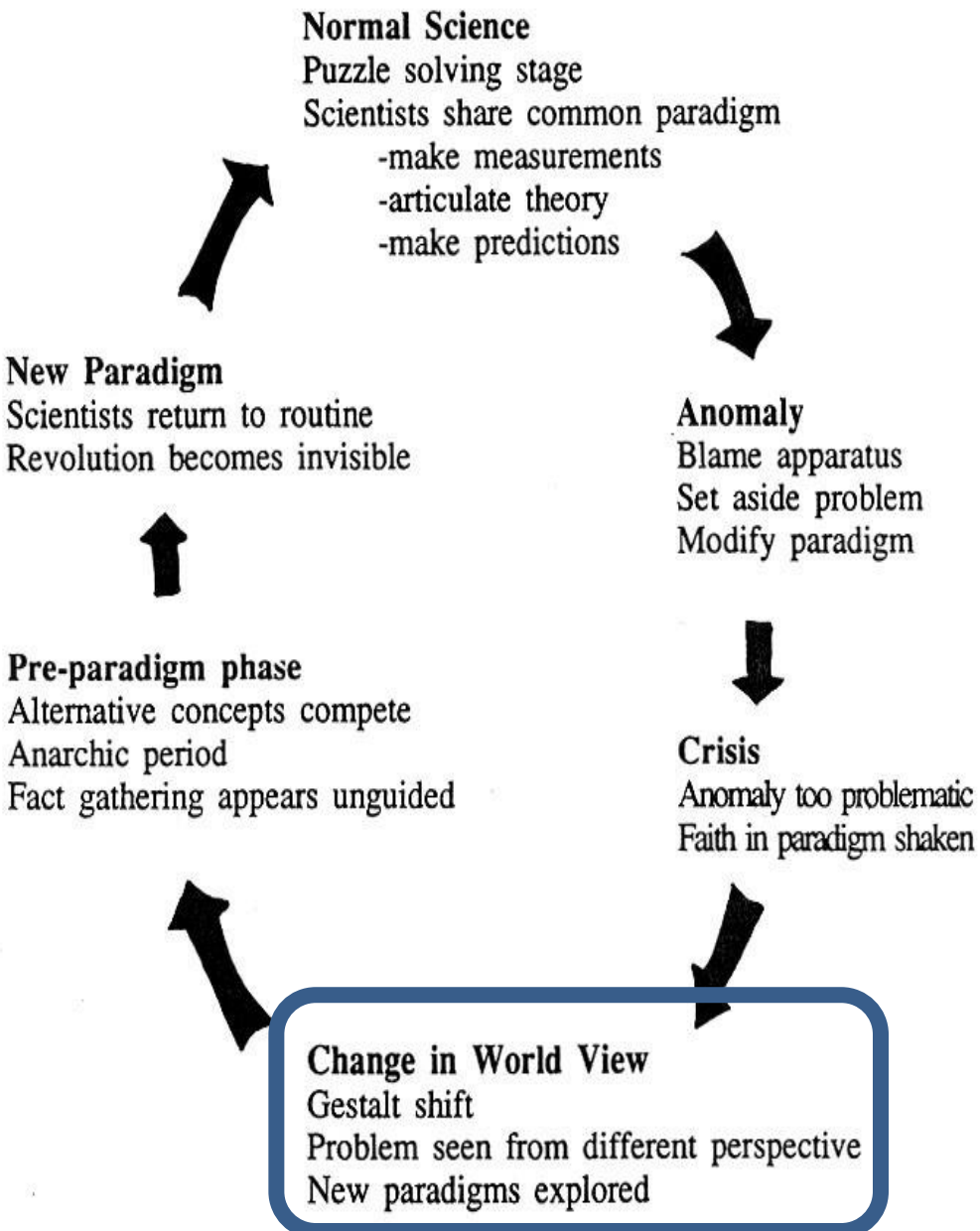
Limits of the current techno-efficiency paradigm

Change in world



"Biodiversity, including the ecosystem services it provides (natural capital), for its intrinsic value and for its essential contribution to human well-being and economic prosperity."

"The current knowledge base [...] has gaps [...] required to meet emerging policy demands. These gaps call for actions to widen the knowledge base [...] in the coming decade. "... systems science; complex environmental change and systemic risks; global megatrends; interplay between socio-economic and environmental factors; transitions in production-consumption systems; environmental risks to health; and the inter-relationships between economic development, environmental change and human well-being." (7EAP)

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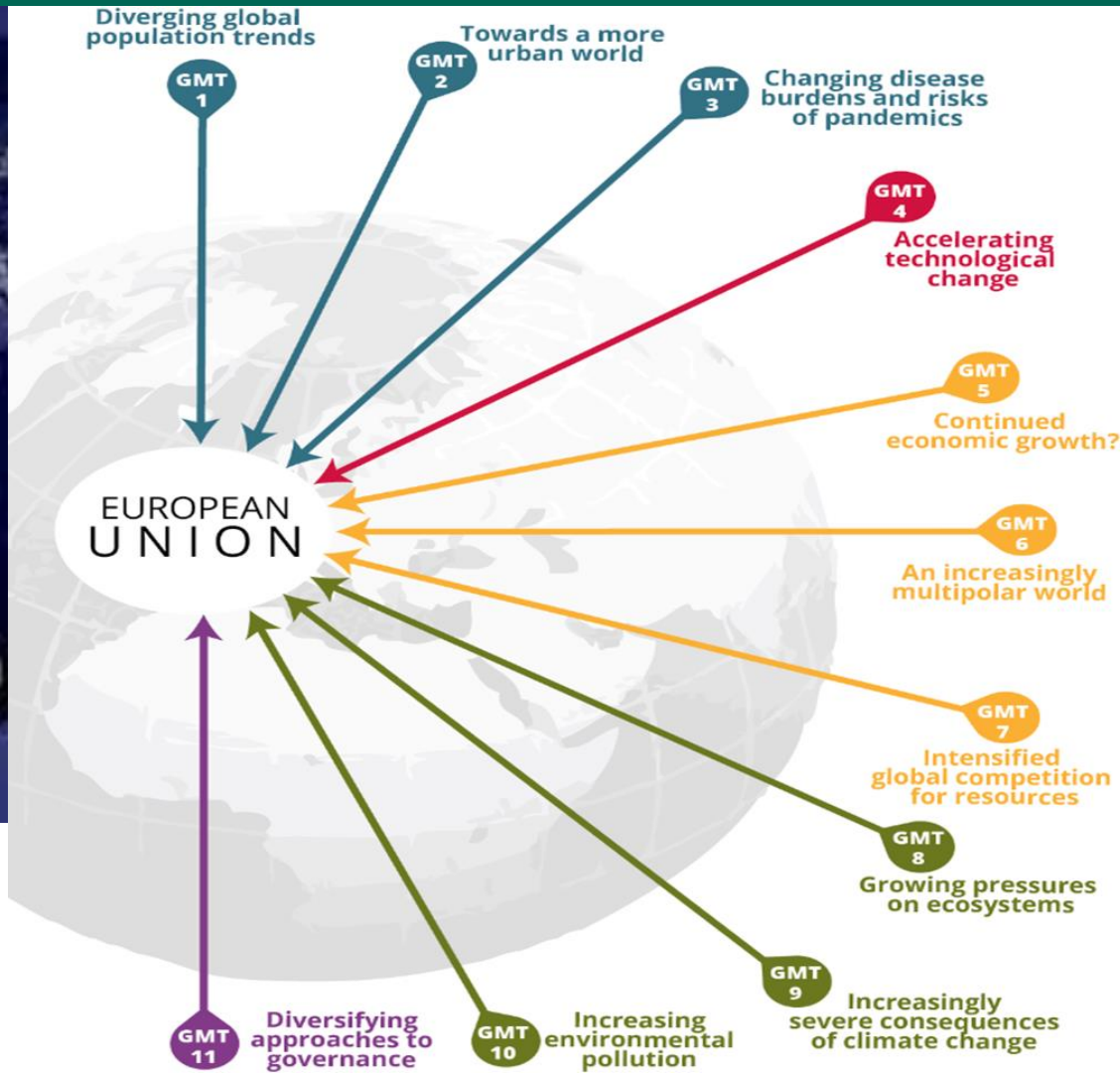
Changes in understanding

Changing global context:
impact and role for Europe?



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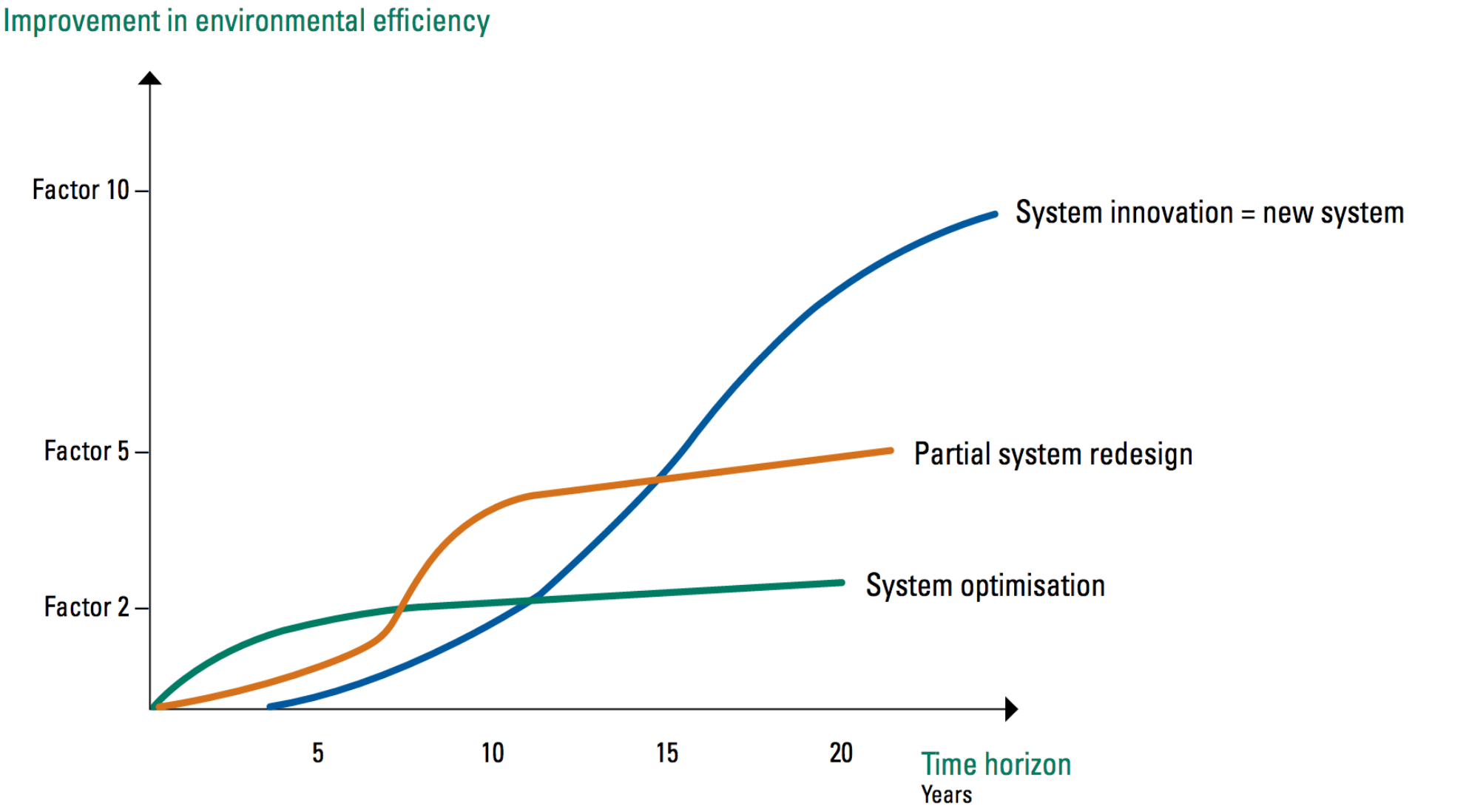
Gestalt Schift in problem analysis and responses?

Transitions

= **fundamental shifts** in the **systems** that fulfill societal needs, through profound changes in *dominant* **structures, practices, technologies, policies, lifestyles, thinking** …

… in line with the sustainable development ambitions and objectives embedded in the Sustainable Development Goals

Achieving needed change requires system innovation



Source: UNEP (from Wetering et al., 1997)

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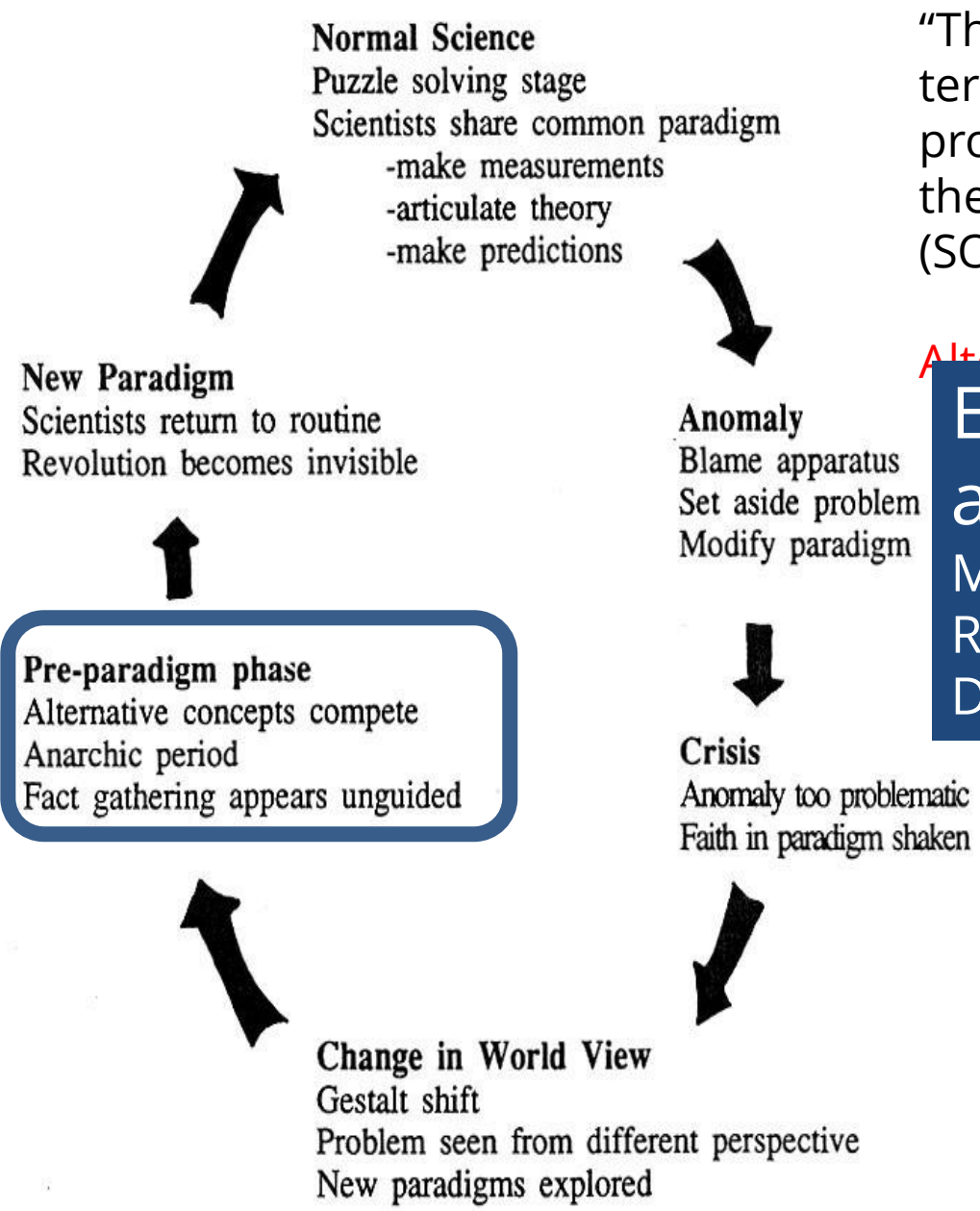
Evolving policy responses: macro-integrated approach

- **Long-term**: 2030-2050-2100
- **Integrated**: e.g. Common Agricultural Policy
- **Systemic**: e.g. Decarbonisation of transport
- **Developing/iterative**: e.g. Circular Economy; Climate and Energy
- Require a **different governance** approach
- Thus, complex, uncertain, **lacking knowledge** (of a certain type)

In the direction of a new



"The transition to a green economy is a long-term, multi-dimensional and fundamental process that will require a move away from the current linear economic model…" (SOER2015)

Alternative concepts:

Europe's emerging transition agenda

Making sense of the Green, Blue, Circular, Resource Efficient, Low Carbon, Bio, Smart, Digital Economy?

Unguided fact gathering: e.g. green economy; green investments; green finance; circular economy; green jobs; smart cities; …

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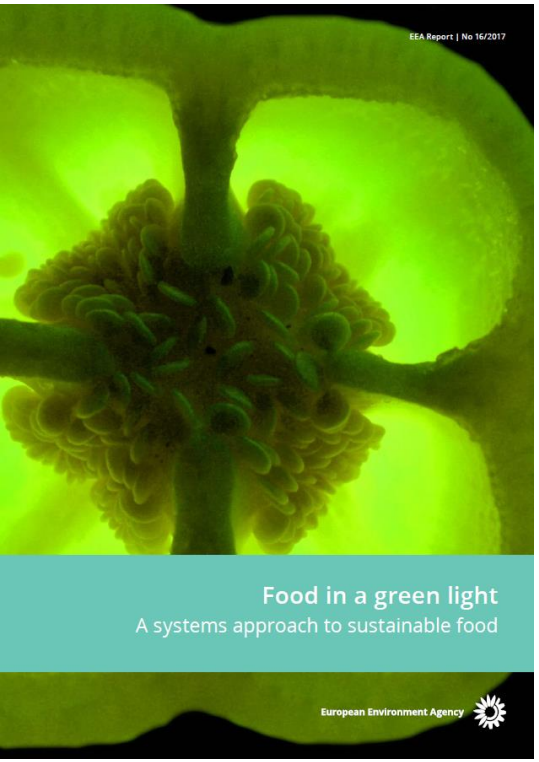
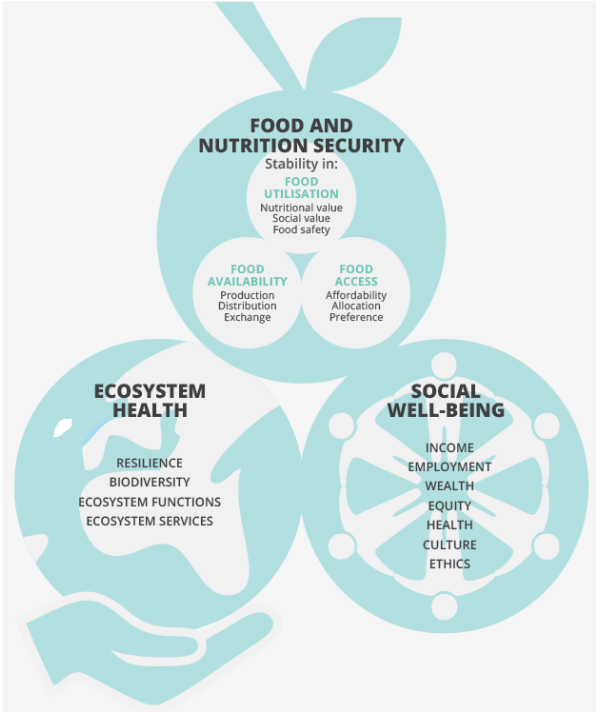
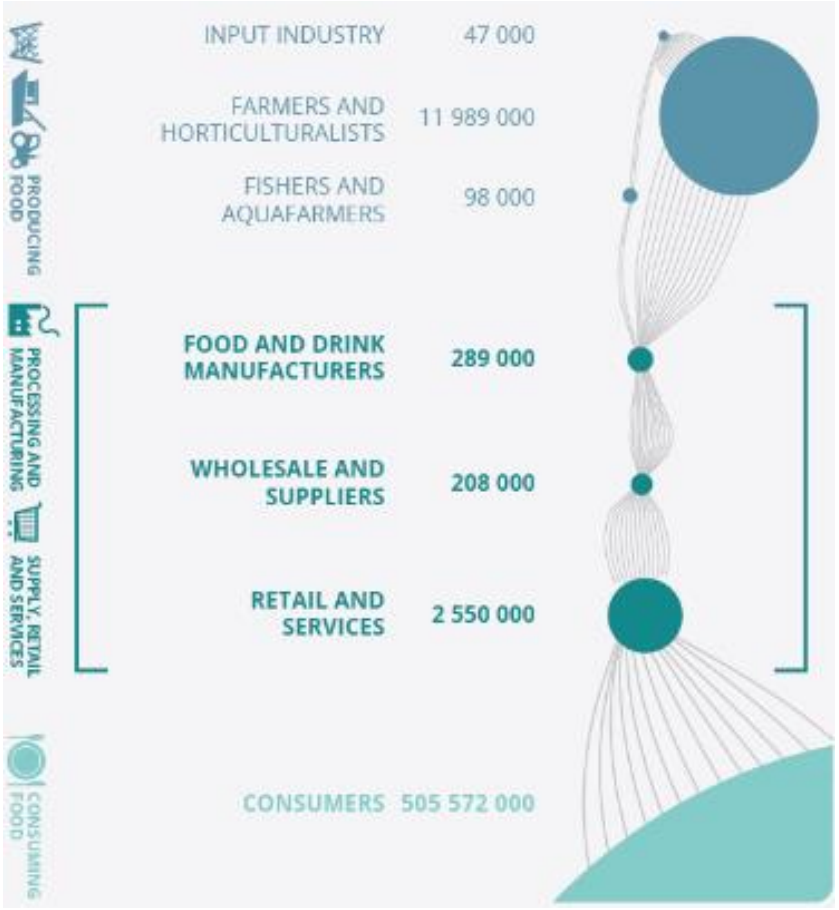
Taking a fundamental systems perspective







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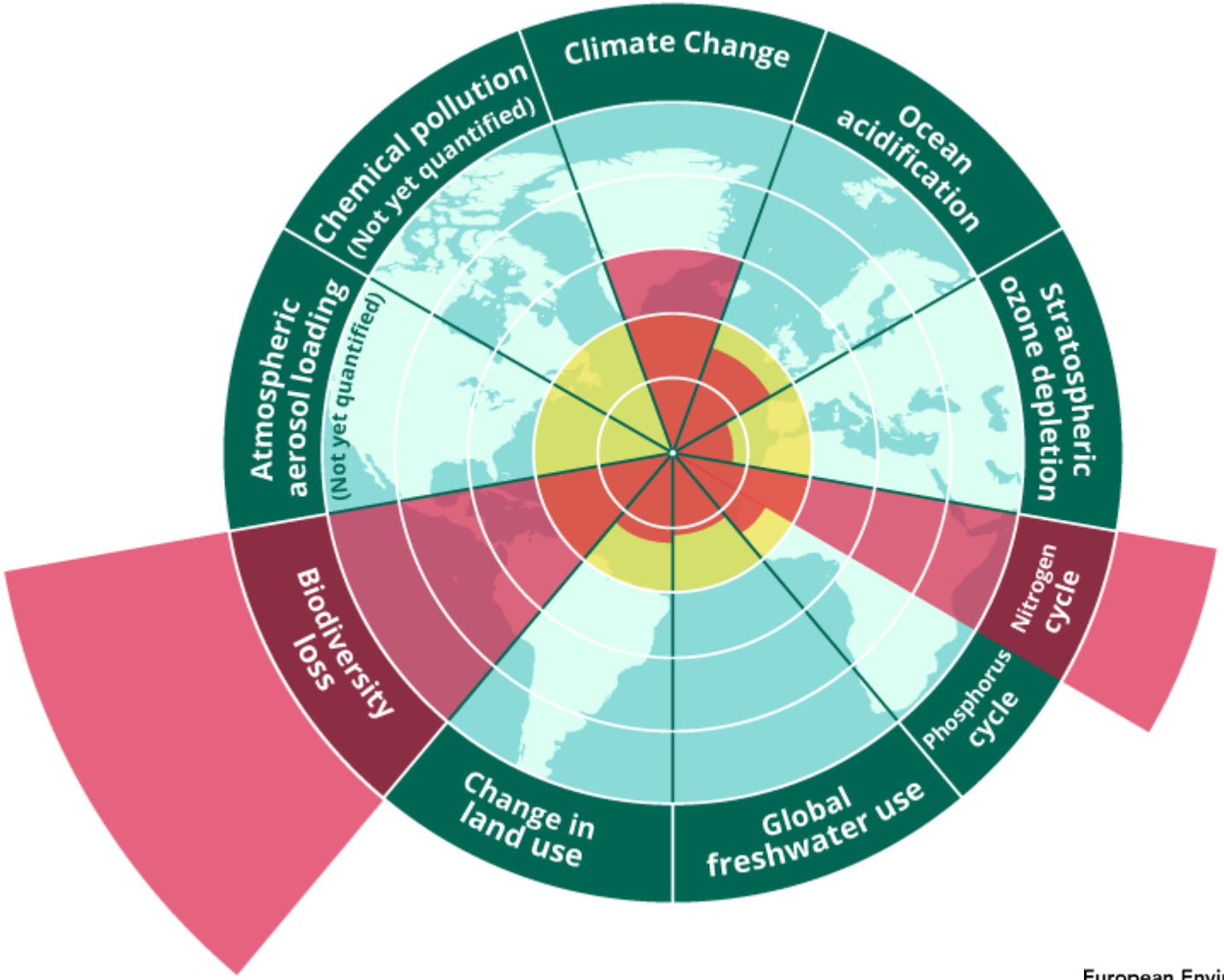
Serious reflection on policy implications?



Source: 2017 EEA elaboration on Stockholm Resilience Center's original image

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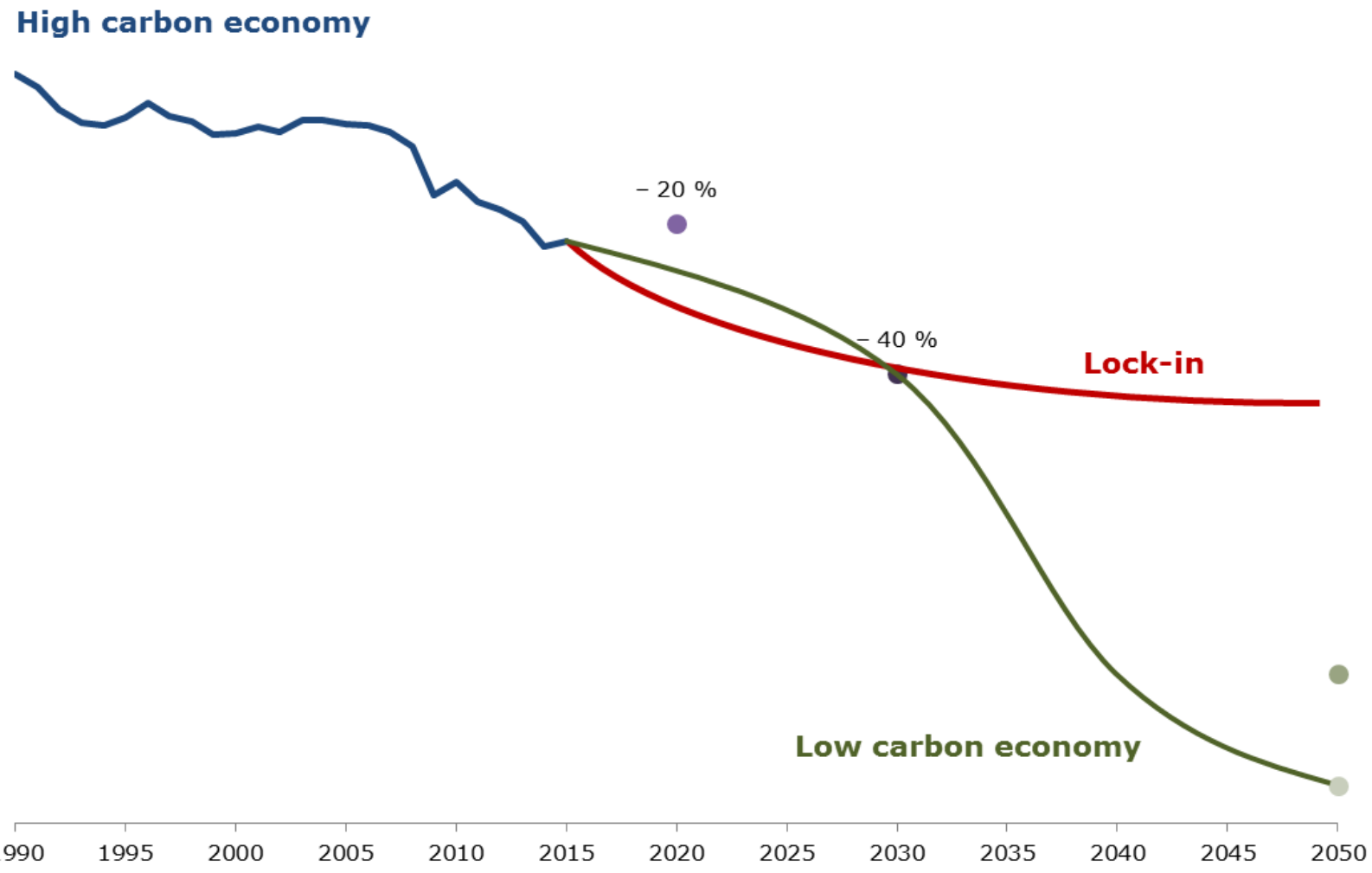
Creating pathways to sustainability



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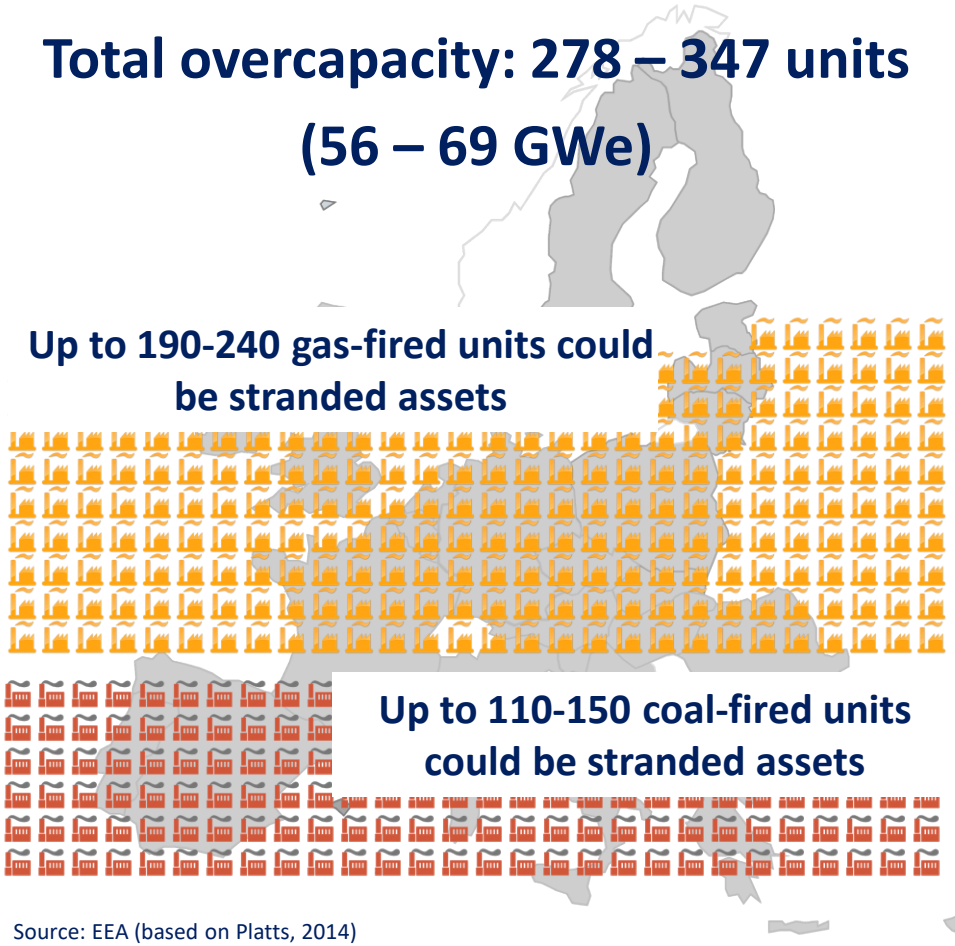
Transforming the EU power sector – avoiding a carbon lock-in

Total overcapacity: 278 – 347 units

(56 – 69 GWe)



Source: EEA (based on Platts, 2014)

Gas-fired

1 Unit = 200 MWe

Coal-fired

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

1/3 of the capacity of all coal-fired and gas-fired units, respectively, would be in excess in 2030, and thus at risk of becoming stranded

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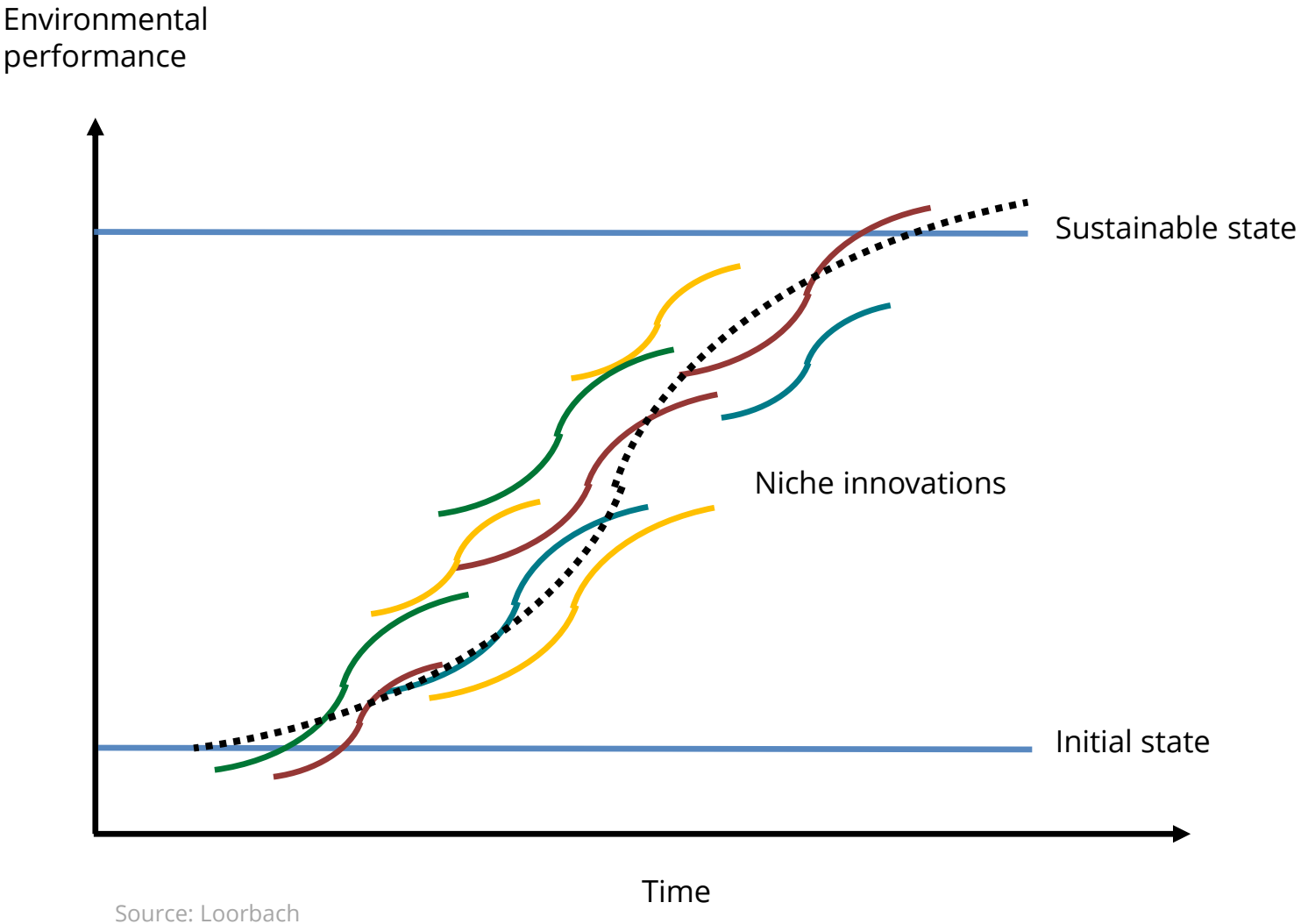
Systemic change combines multiple innovations



Source: Loorbach

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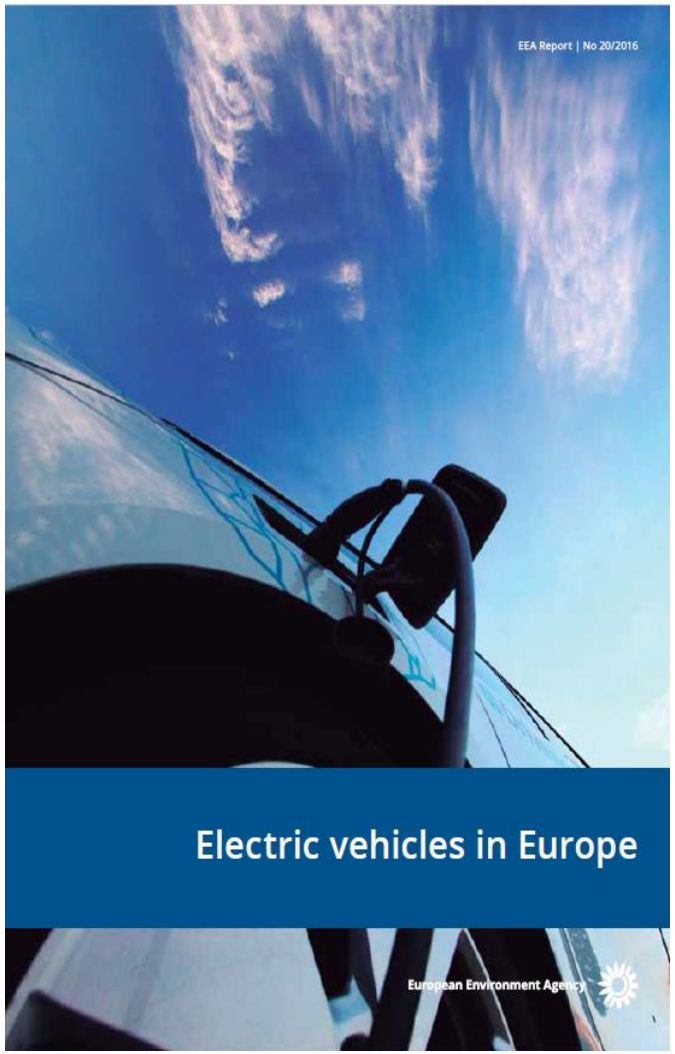
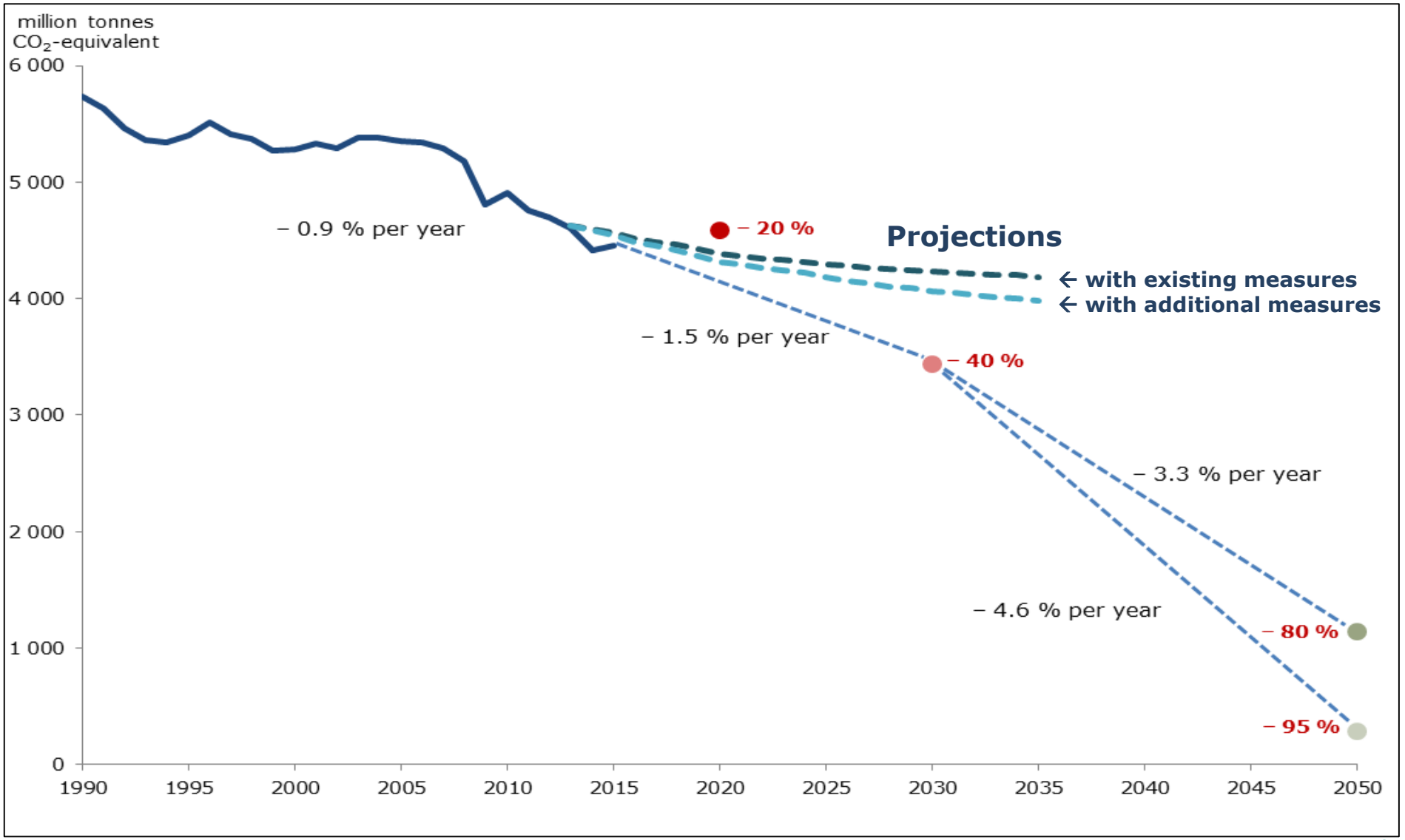
Catalysing the shift to electric vehicles



Supporting incentives and coordinated policies are key in accelerating electric vehicle market development.

INSTRUMENT	EXAMPLES
Regulatory incentives	CO2 standards, sales targets
Financial measures	Subsidies, loans, capital grants
Non-financial incentives	Access to bus lanes, free parking
Information provision	Product labels, PR campaigns, public debates
Infrastructure provision	Charging infrastructure, finance home chargers
Technology push institutions	EU Business Innovation Centres

Long-term challenge: speeding-up emission reductions



Source: EEA, Trends and projections in Europe 2016 — Tracking progress towards Europe's climate and energy targets.

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Lock-ins and barriers for change

Systemic approach

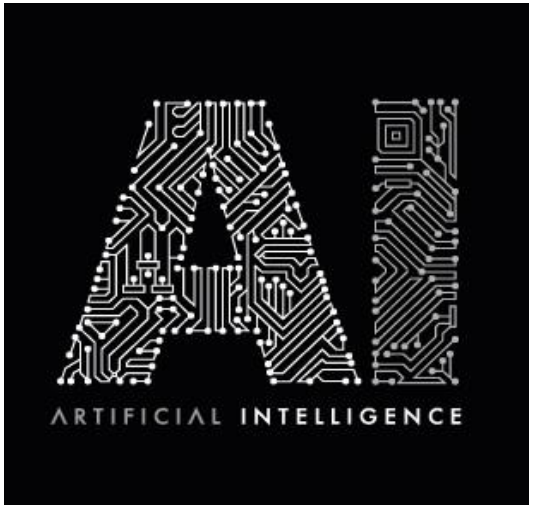
- Spatial planning
- (Urban) infrastructure
- Fiscal system
- Pricing of externalities
- R&D
- Lack of long-term vision (Pact idea)
- Behaviour
- Attractive alternatives
- SMART

Source: Marc Hoffmann

Credible alternatives?

Reflecting on the core of the system?

Magic potions?



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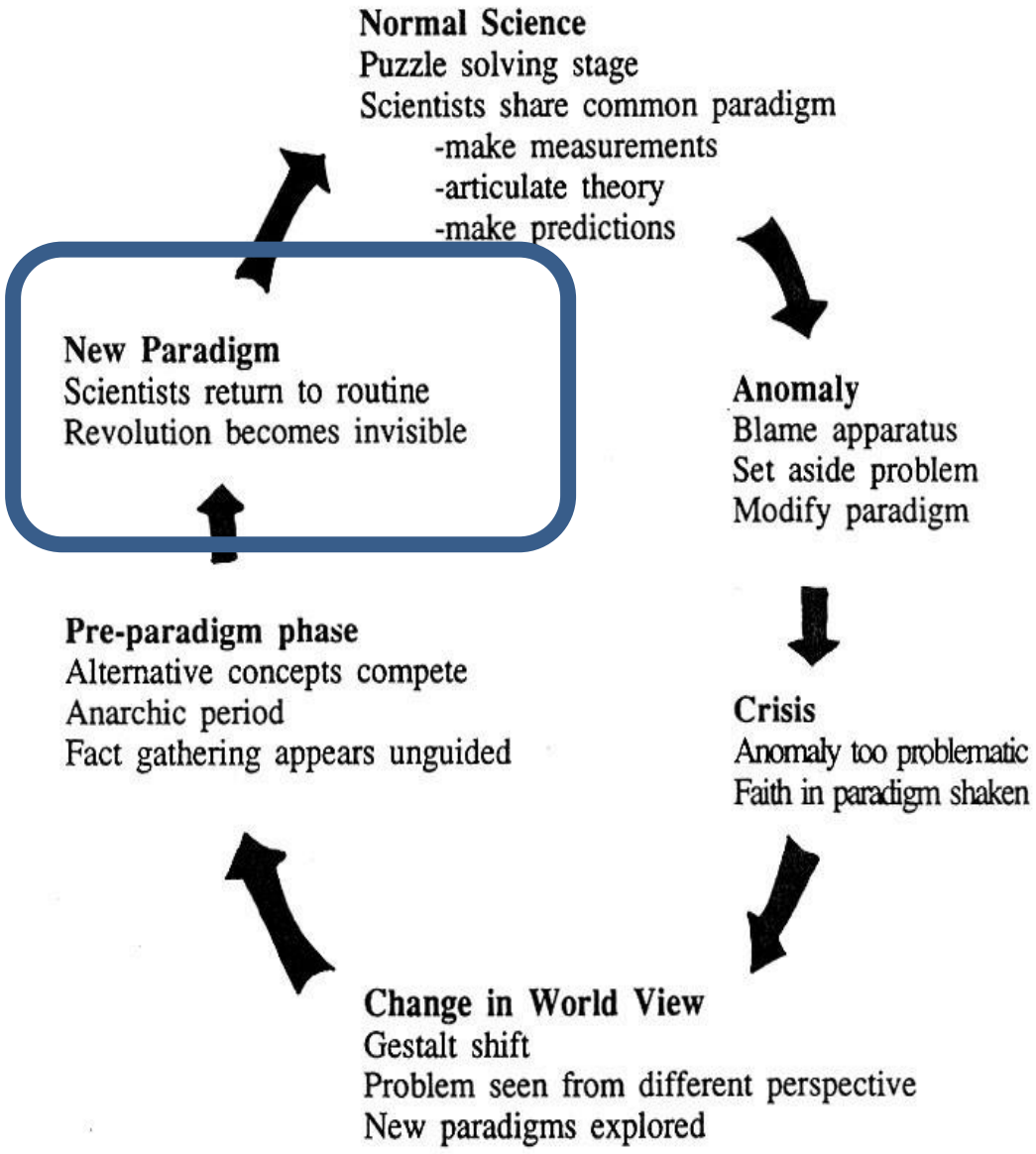
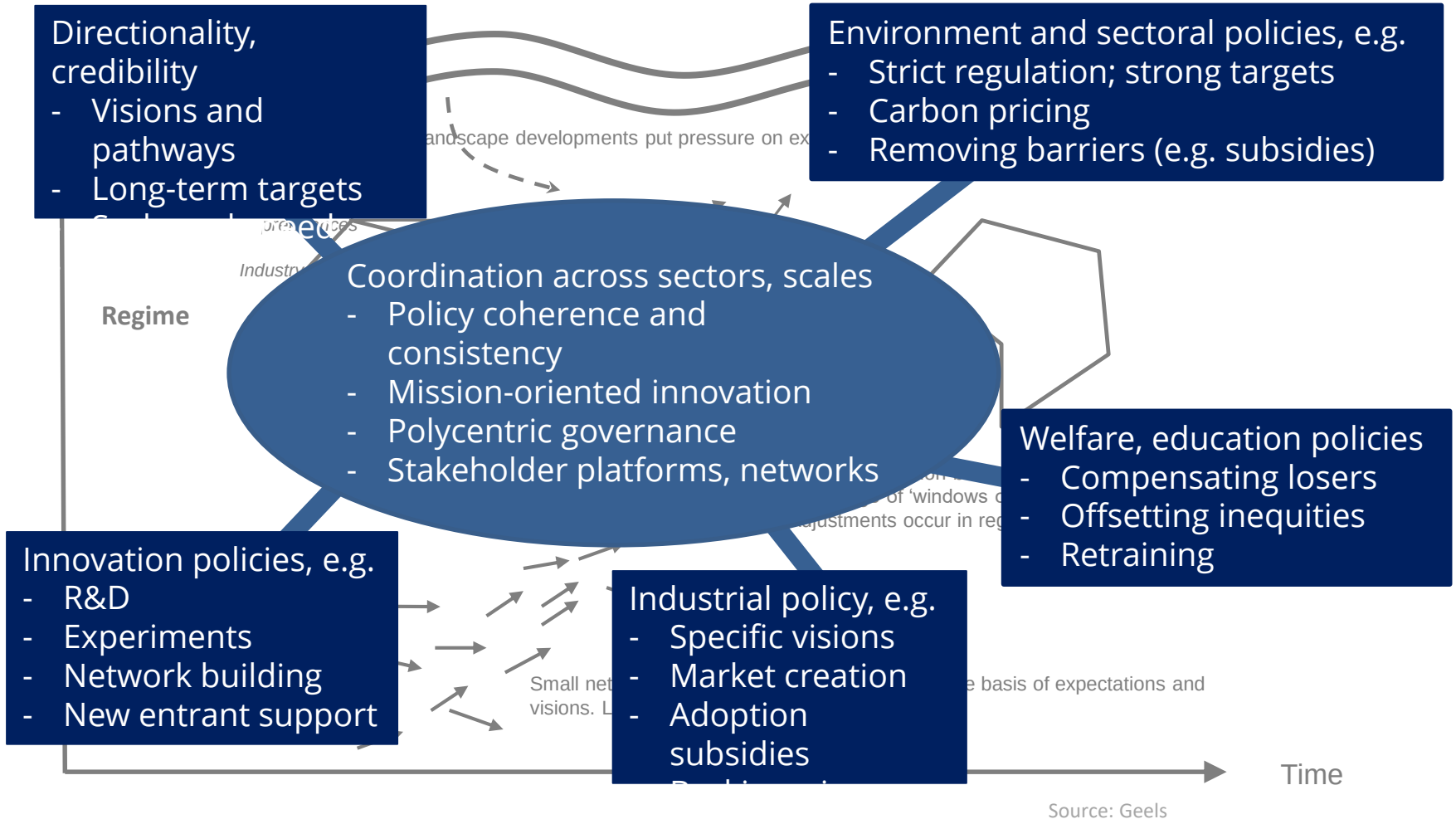
New paradigm-new normal



Policy mixes for systemic change



Source: Geels

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Necessary and mutually reinforcing policy characteristics

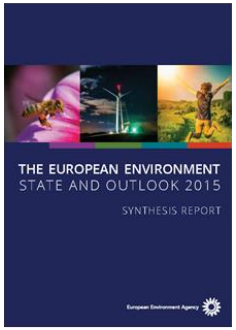
- Consistency
- Coherency
- Strong implementation
- Sense of urgency
- Visionairy
- Engaging

And thus credible to put us on a trajectory for the ‘best century’.

Supporting transitions demands new types of knowledge

Understanding systemic challenges and the need for transitions

Identifying knowledge, skills and governance approaches for transitions



SOER 2020

PROBLEM-FOCUSED

SOLUTION-ORIENTED

Thank you

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