

SDG's, van strafe beloftes en mooie principes naar concrete resultaten





challenges

. IRP: unsustainable **resource use**

4. WHO: environment and **health**



GLOBAL

**Complexity
Uncertainty
Risk**

PREVENTING HEALTHY ENVIRONMENTS

A global assessment of the burden of disease from environmental risks

A Prüss-Ustün, J Wolf, C Corvalán, R Bos and M Neira



Global response: sustainable development goals (again!)



European Green Deal: a paradigm shift in politics/policy?

- First climate-neutral continent
 - Biodiversity Strategy 2030
 - New Circular Economy Action Plan
 - Zero Pollution Ambitions
 - Fair Transition
 - Just Transition
 - Sustainable Digitalisation
 - Future Circular Economy New industrial strategy
- The political, economic, investment, ... priority for Europe**
- Strong systemic transitions logic**
- Link with sectoral policies
 - Interconnected
 - Longer time horizon
 - Social dimension
 - Innovation, digitalization
- Governance agenda**

“Our *most pressing* challenge is keeping our planet healthy. This is the *greatest responsibility* and opportunity of our times.”

Ambitious, innovative, interconnected, systemic

“Europe must *lead the* transition to a healthy planet and a new digital world.”



Transforming the Green Deal into (social) action

Sustainability as a process of societal transitions

- How to improve conditions for **well-being**?
- Fundamental reflections and policy responses necessary to strengthen **social capital, social cohesion**, ...
- ... within the limits of our disturbed relationship with natural capital
- Future **visioning** based on **ethical** considerations about the future
- Recognizing that **current metrics** that dominate the debate about economic performance are part of the problem
- Serious **innovation** needed in how we **understand societal change**
- Finally **doing** something about this, after decades of theorizing...



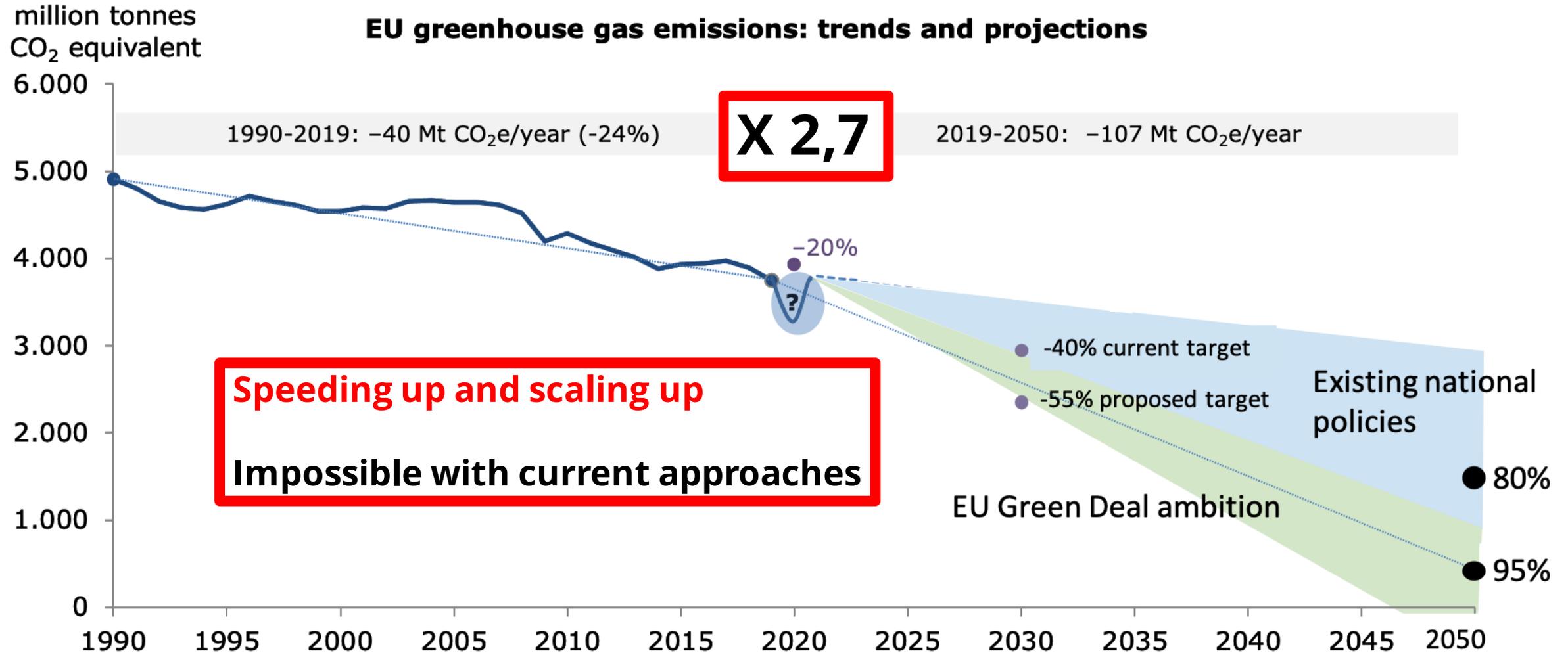
EUROPEAN CLIMATE LAW

2050

CO₂



Net zero emissions: ambitious targets require a **paradigm shift**



Bringing nature back into our lives

Restoration
Nature Based Solutions

EU 2030 Biodiversity strategy

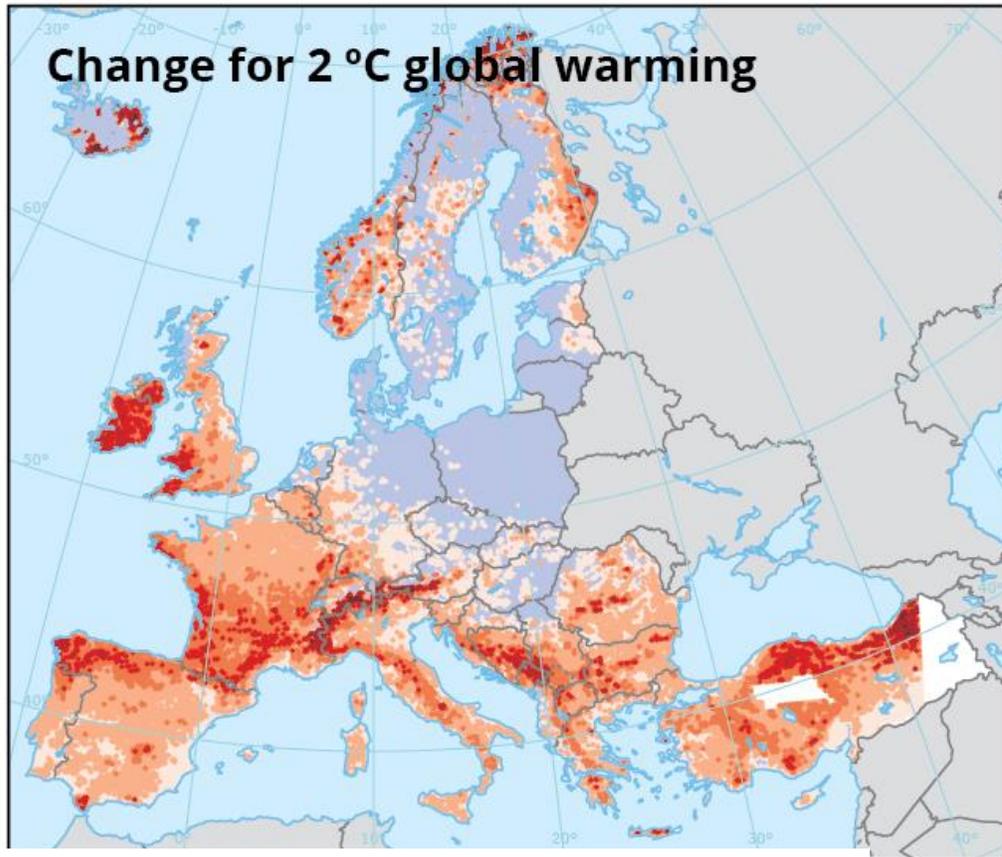
May 2020
#EUGreenDeal



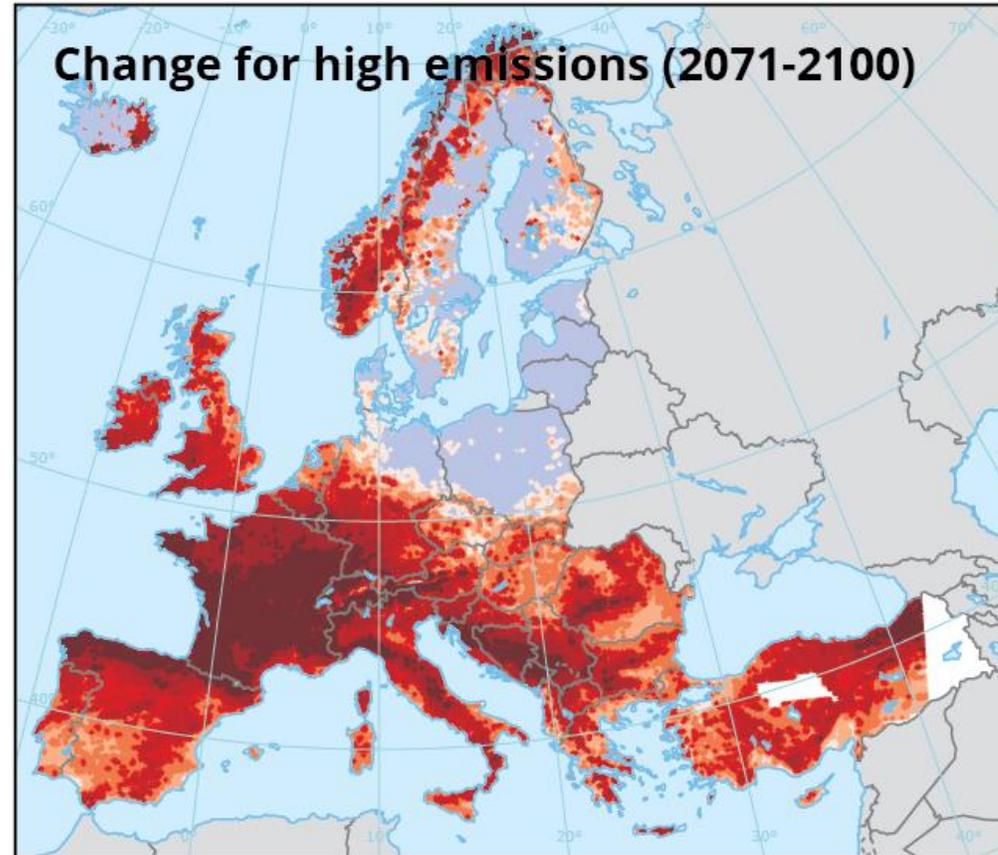
“Making nature healthy again is key to our physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks. It is at the heart of our growth strategy, the European Green Deal, and is part of a European recovery that gives more back to the planet than it takes away.”

Ursula von der Leyen, President of the European Commission

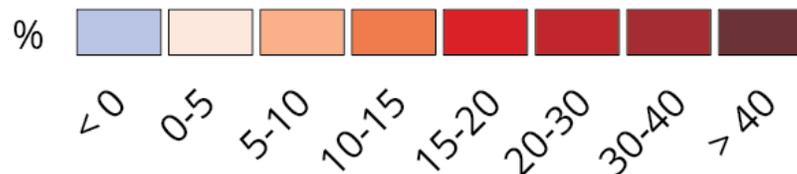
Low emissions scenario



High emissions scenario



Projected change in fire weather index



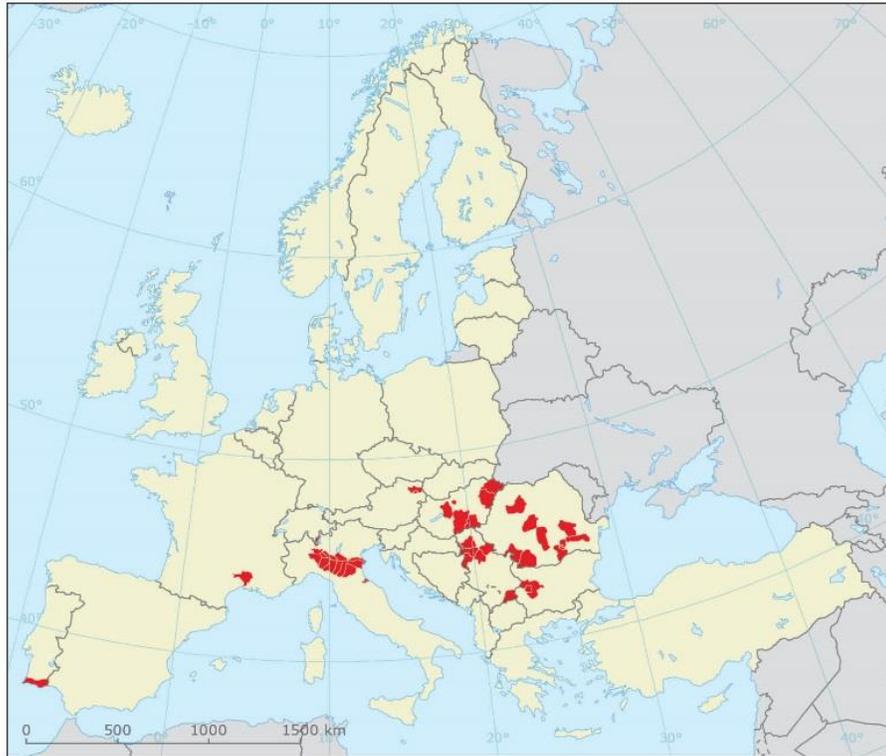
Based on Fire Weather Index (FWI)
Source: Joint Research Centre (JRC)



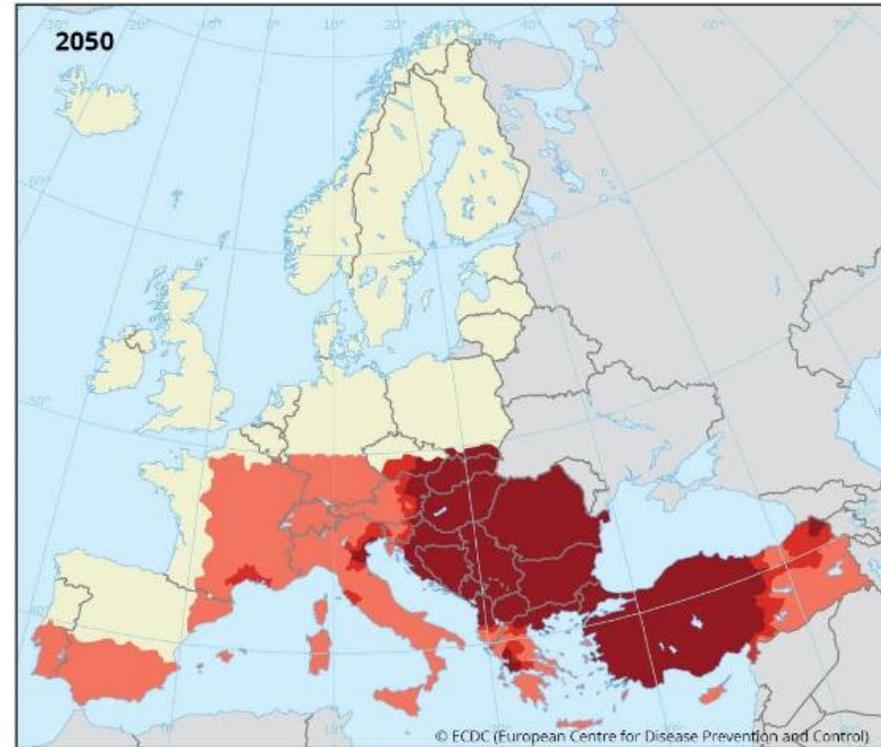
Precipitation (2071–2100)



West Nile fever (2014)

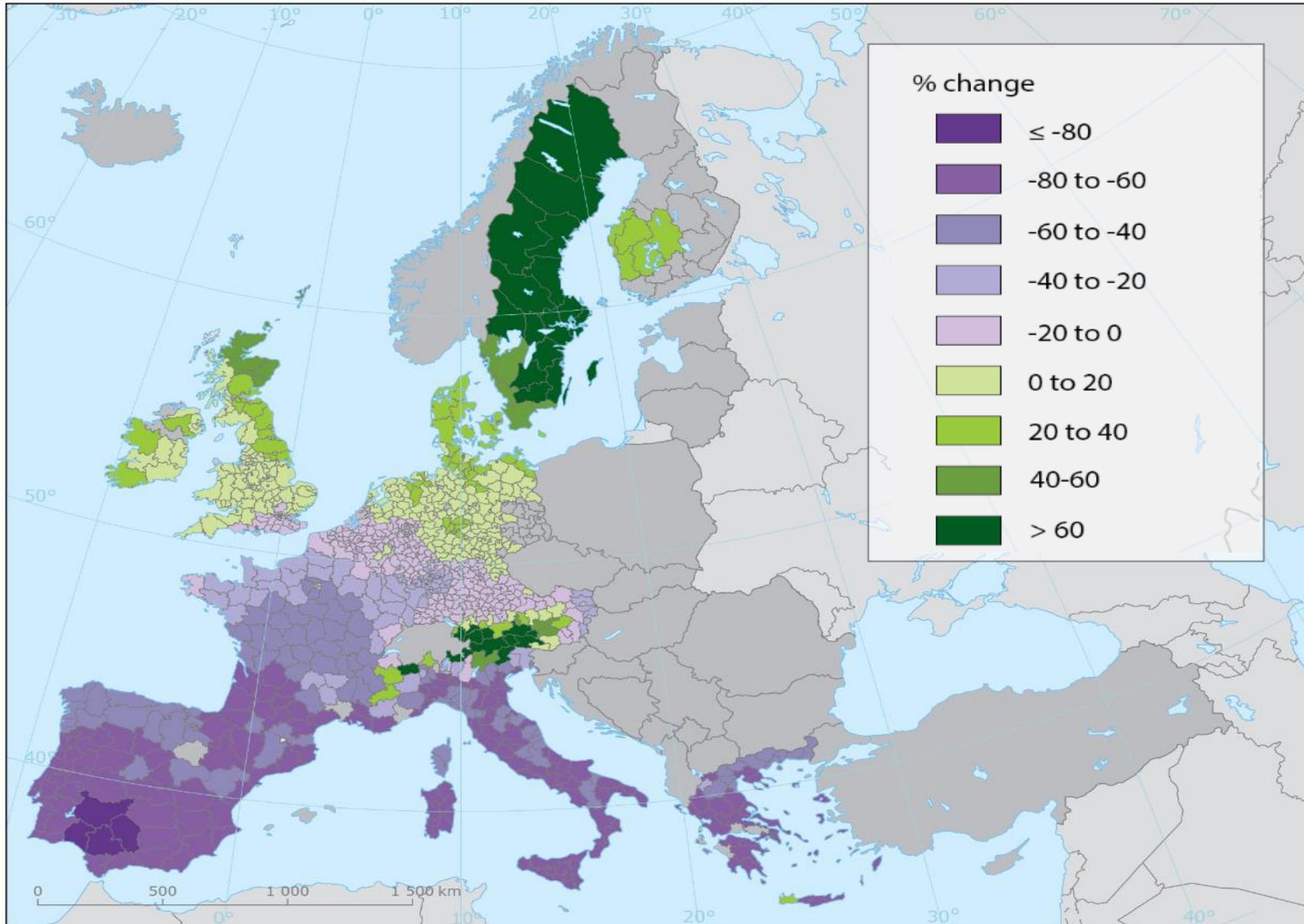


West Nile fever (projections for 2050)



Source: ECDC (Semenza et al. 2014)

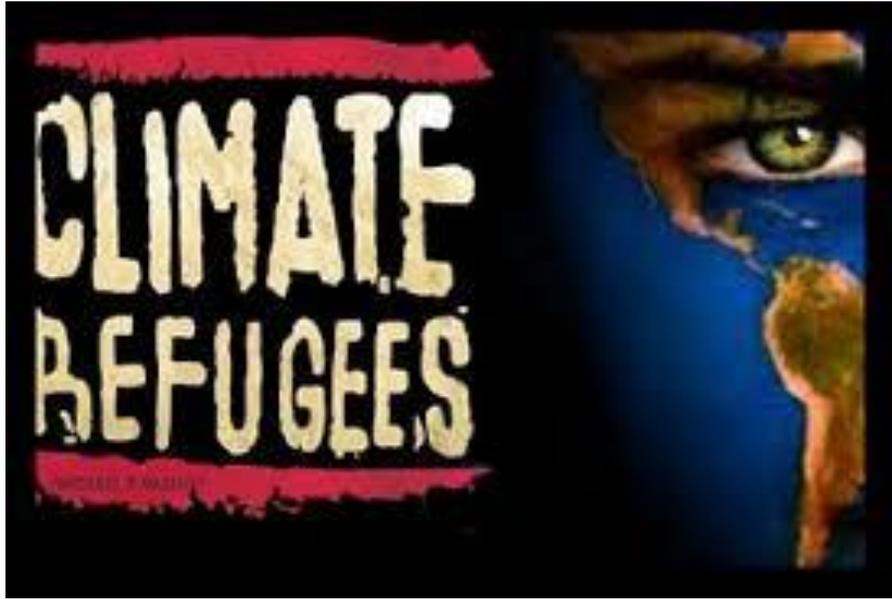
Climate change: a systemic game-changer



Projected change
in farmland value
by 2100

Source: van Passel et al., 2017

Geo-political impacts of climate induced human drama...



“Make sustainable products the norm in the EU”

New circular economy action plan launched



What does it really mean?



SOER 2020: some successes but a **discouraging outlook**

1. Natural capital

2. Low carbon and resource efficient economy

3. Health and wellbeing

Past trends
(5-10 years)

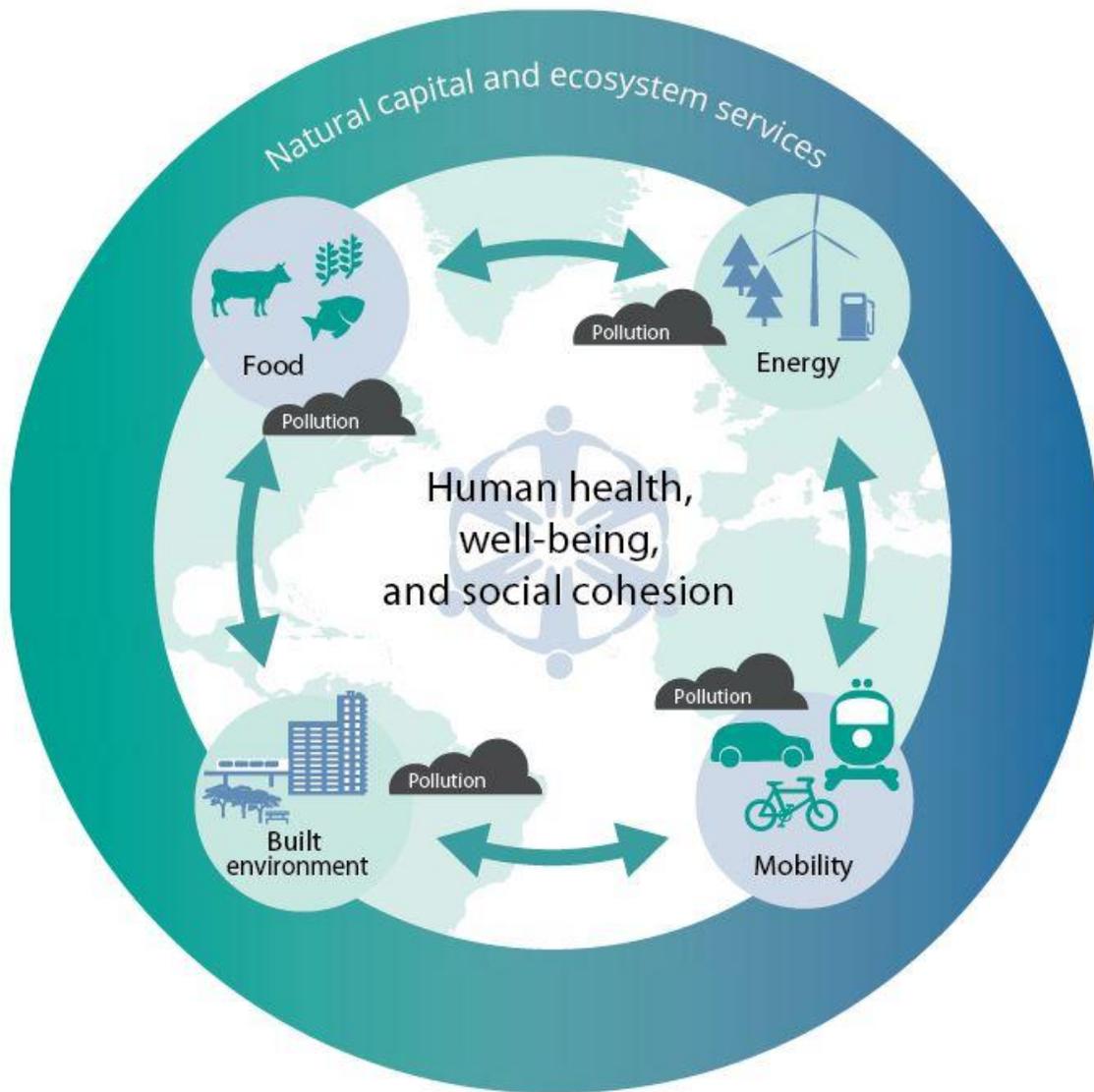


Outlook
To 2030

BAU+ no longer an option

- Terrestrial protected areas
- Marine protected areas
- EU protected species and habitats
- Common species
- Ecosystem condition and services
- Water ecosystems and wetlands
- Hydromorphological pressures
- State of marine ecosystems and biodiversity
- Pressures and impacts on marine ecosystems
- Urbanisation and land use by agriculture and forestry
- Air pollution and impacts on ecosystems
- Chemical pollution and impacts on ecosystems
- Climate change and impacts on ecosystems
- Material resource efficiency
- Circular use of materials
- Waste generation
- Waste management
- Greenhouse gas emissions and mitigation efforts
- Energy efficiency
- Renewable energy sources
- Emissions of air pollutants
- Pollutant emissions from industry
- Clean industrial technologies and processes
- Emissions of chemicals
- Water abstraction/pressures on surface and groundwater
- Sustainable use of the seas
- Concentrations of air pollutants
- Air pollution and impacts on human health
- Environmental noise and impact on human health
- Preservation of quiet areas
- Pollution pressures on water and links to human health
- Chemical pollution and risks to human health
- Climate change risks to society
- Climate change adaptation strategies and plans

Catalysing **systemic change**



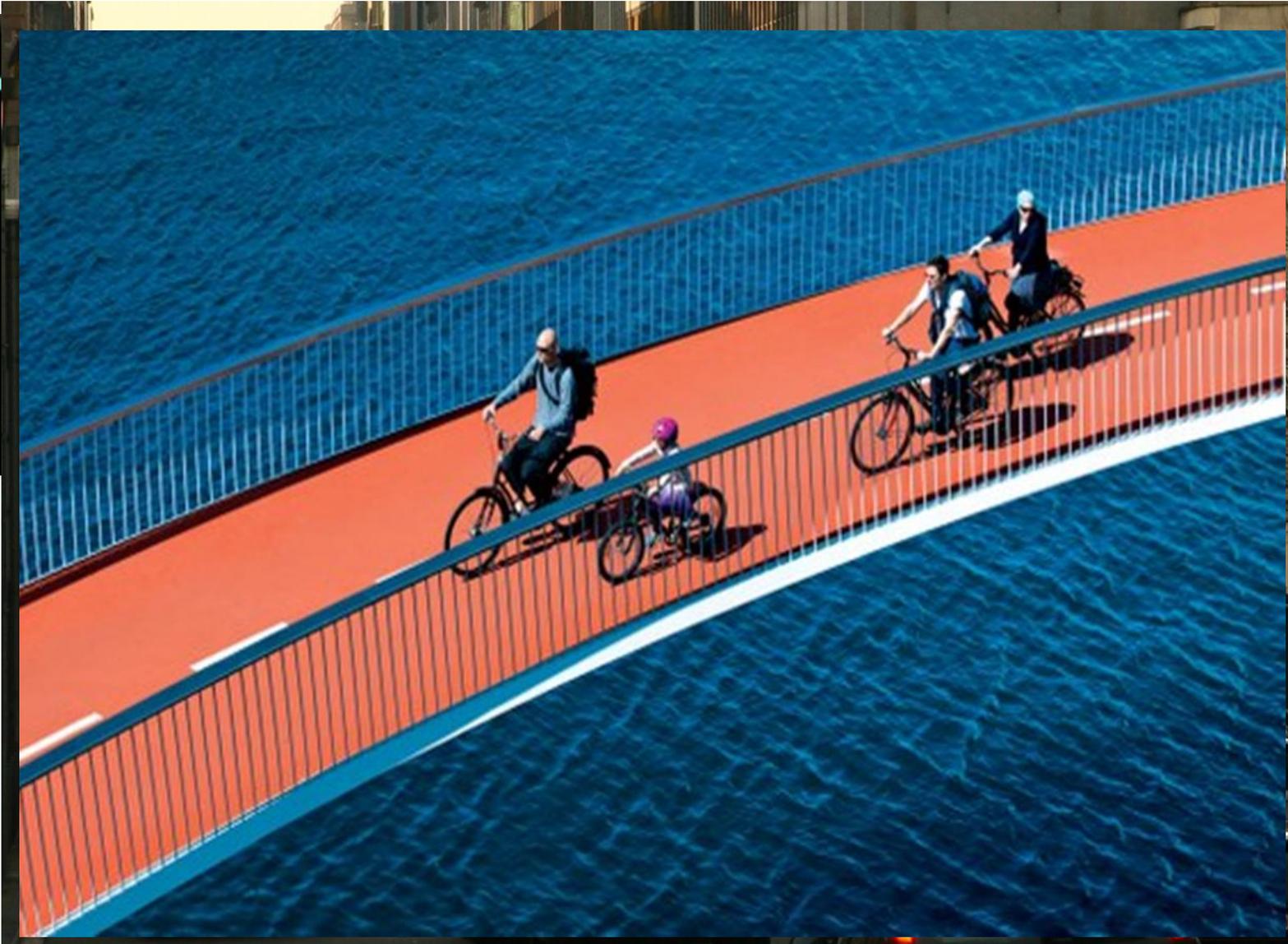
- Recognise fundamental **drivers** and system **interlinkages**
- Adopt transformative **policy frameworks**
- Fill **crucial policy gaps**:
 - Food
 - Land and soil
 - Chemicals
 - **Social dimension**
- Leverage the power of **cities, businesses and communities** for society-wide action



Recognizing the scope of systemic challenges & transitions

- **Transformations** should be of a **'deep' character**
- **No 'silver bullets'** to solve complex challenges.
- **We are deeply locked-in** and entrenched **in social practices and paradigms**
- **These can become barriers to fundamental change**

Silver bullet? Fragmented solutions don't work

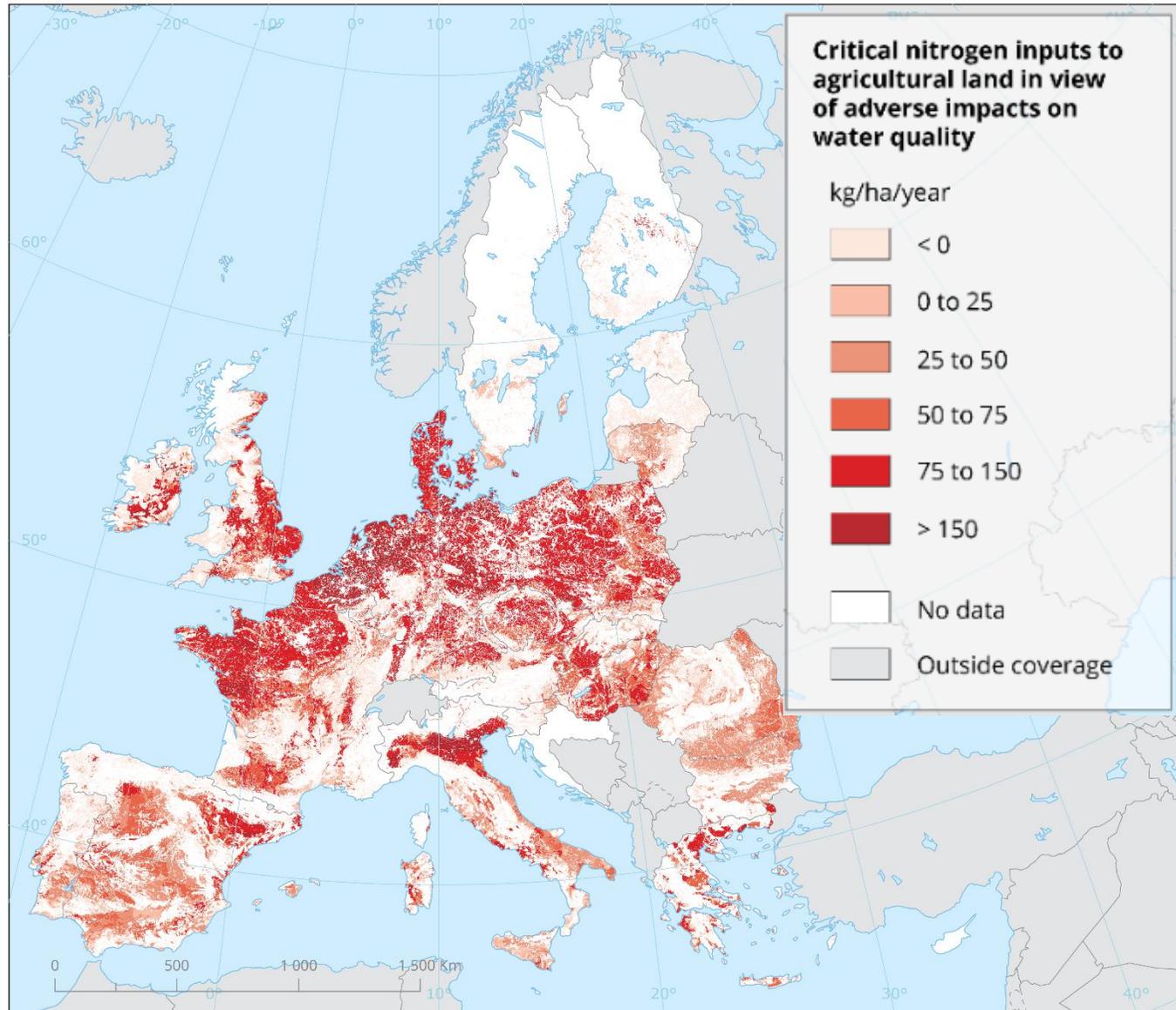


All Canada Photos/D. Reade

Another silver bullet?
The digital **panacea**?

The background of the slide is a complex, abstract digital visualization. It features a dense network of glowing lines and particles in shades of cyan, blue, and magenta. The lines appear to be data paths or connections, radiating from various points and creating a sense of depth and movement. The overall aesthetic is futuristic and high-tech, typical of a digital or data-themed presentation.

Policy integration largely unsuccessful: agriculture



- Unsustainable agriculture still main threat to biodiversity and natural capital in Europe
- Pollution of soil, water, air and food
- Over-exploitation of natural resources
- **Greening of the CAP shown to be ineffective**

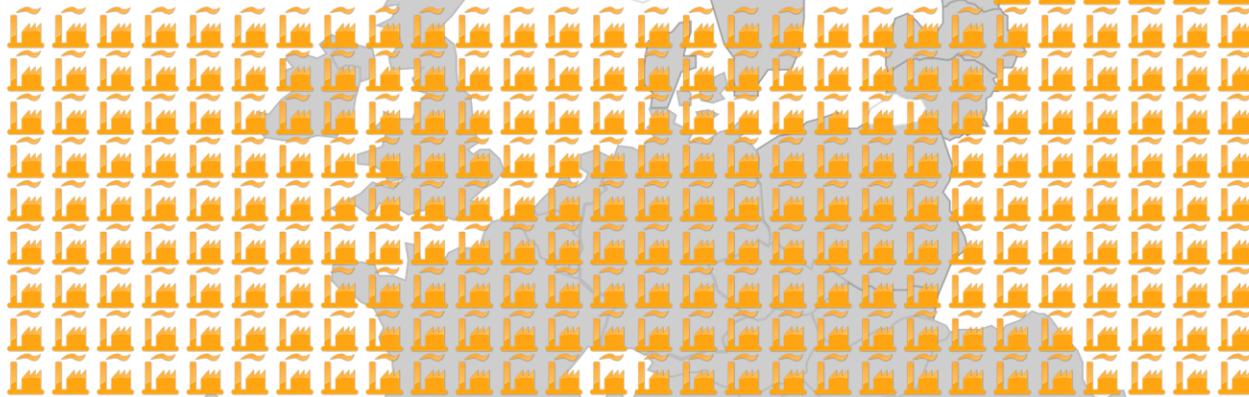
Complex, multifunctional systems with diverse **lock-ins**



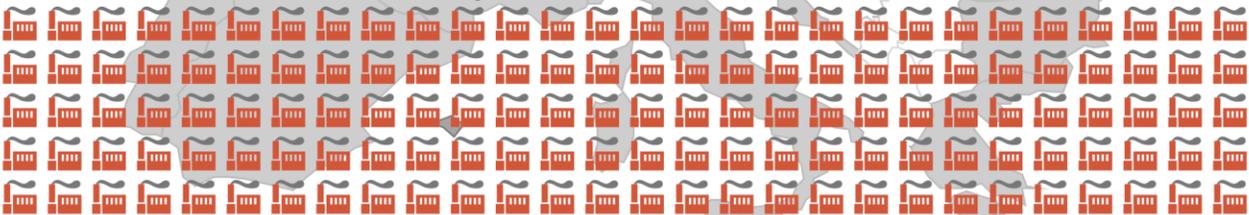
'Medium term-ism' as a new risk?

**Total overcapacity: 278 – 347 units
(56 – 69 GWe)**

Up to 190 - 240 gas-fired units could be in excess...



Up to 110 - 150 coal-fired units could be in excess...



**Risk of stranded capacity by
2030 (extended lifetimes)**



Gas-fired



Coal-fired

1 Unit = 200 MWe



Going to the **core of the system** Financing a sustainable and just transition



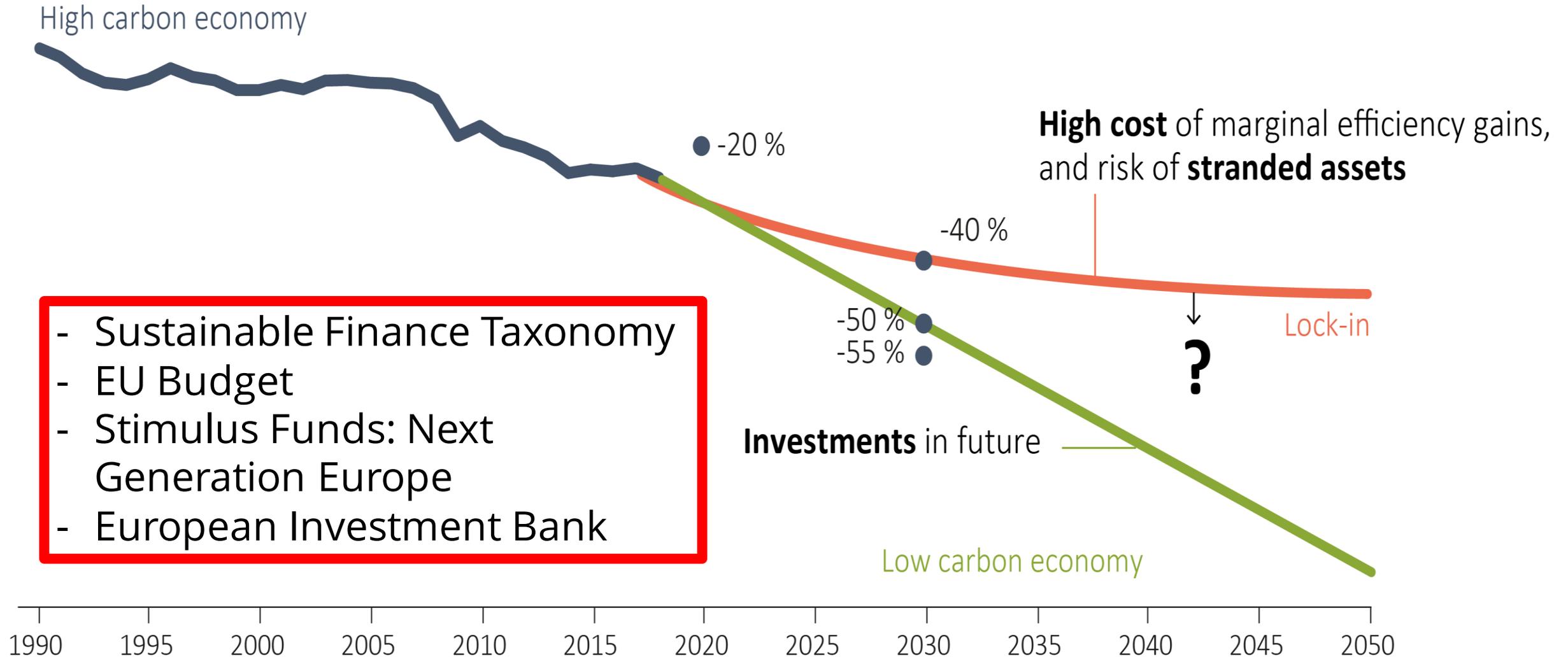
FINANCING A SUSTAINABLE
EUROPEAN ECONOMY



TAXONOMY

Technical Report

Investing in sustainability, not dead-end streets



Societal change: vulnerability, resilience and just transition



Social dimension:

- Underdefined
- Poor knowledge base
- Linked to fundamental debate on distributional issues
- Linking Europe to the rest of the world

The Just Transition Mechanism (JTM) will primarily support regions and workers who are most affected by the transition towards a green economy.

THE JUST TRANSITION MECHANISM

Helping address the social and economic effects of the transition and workers who will face the greatest challenges.

FINANCIAL SUPPORT

- a new Just Transition Fund of investments;
- InvestEU "Just Transition" scheme, mobilising **€45 billion** of investment;
- a new public sector loan facility with the EIB backed by the EU budget, mobilising **€25-30 billion** of investments.

TRANSITION PLANS for beneficiary regions to steer the investments

ATTRACTIVE CONDITIONS and risk sharing for public and private investors

TECHNICAL ASSISTANCE via a Just Transition Platform to advise and support

Just Transition Fund

- **€7.5 billion** new funding
- match each € from the JTF with **€1.5-3** from the ERDF/ESF+
- national co-financing



December 2019
#EUGreenDeal

significant amounts of energy and



The current rates of renovation of public and private buildings should at least double

Better energy performance of buildings

Prices of different energy sources should incentivise **energy-efficient buildings**

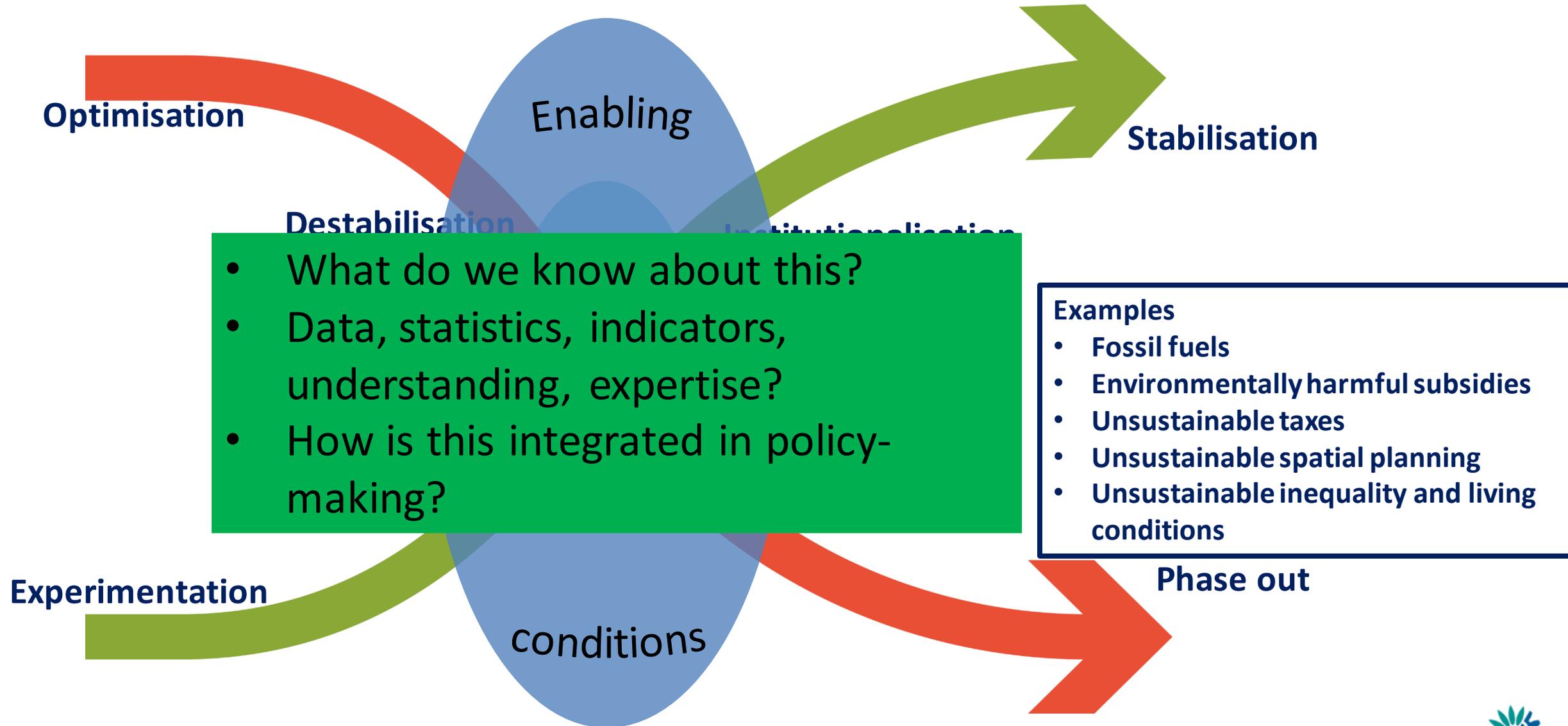
Design of buildings should be in line with the **circular economy**

Increased **digitalisation**

More **climate-proofing** of buildings

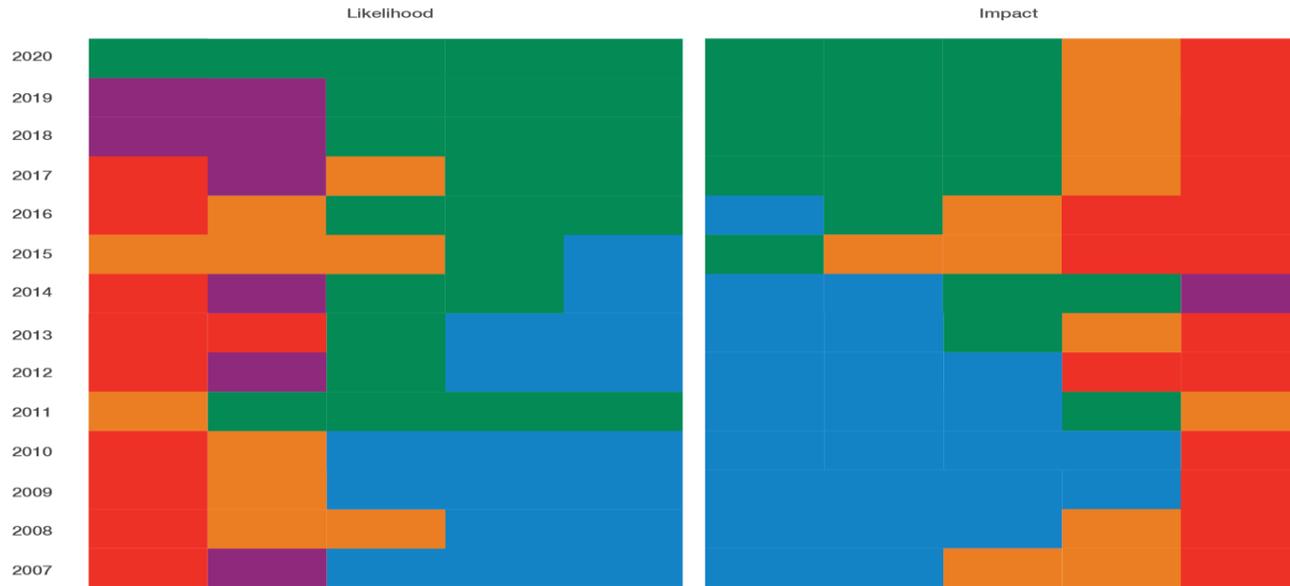
Strict enforcement of rules on **energy performance of buildings**

The 'x-curve': lacking attention for the **difficult part** and **conflict**



TOP GLOBAL RISKS

From economic to environmental. Climate now tops the risks agenda, while the economy has disappeared from the top five.



A context of risk and uncertainty

Economic

- Asset bubble
- Critical infrastructure failure
- Deflation
- Energy price shock
- Financial failure
- Fiscal crises
- Illicit trade
- Unemployment
- Unmanageable inflation

Environmental

- Biodiversity loss
- Climate action failure
- Extreme weather
- Human-made environmental disaster
- Natural disasters

Geopolitical

- Global governance failure
- Interstate conflict
- National governance failure
- State collapse
- Terrorist attacks
- Weapons of mass destruction

Societal

- Failure of urban planning
- Food crises
- Infectious diseases
- Involuntary migration
- Social instability
- Water crises

Technological

- Adverse technological advances
- Cyberattacks
- Data fraud or theft
- Information infrastructure breakdown

EGD: promising a speeding-up of the transition

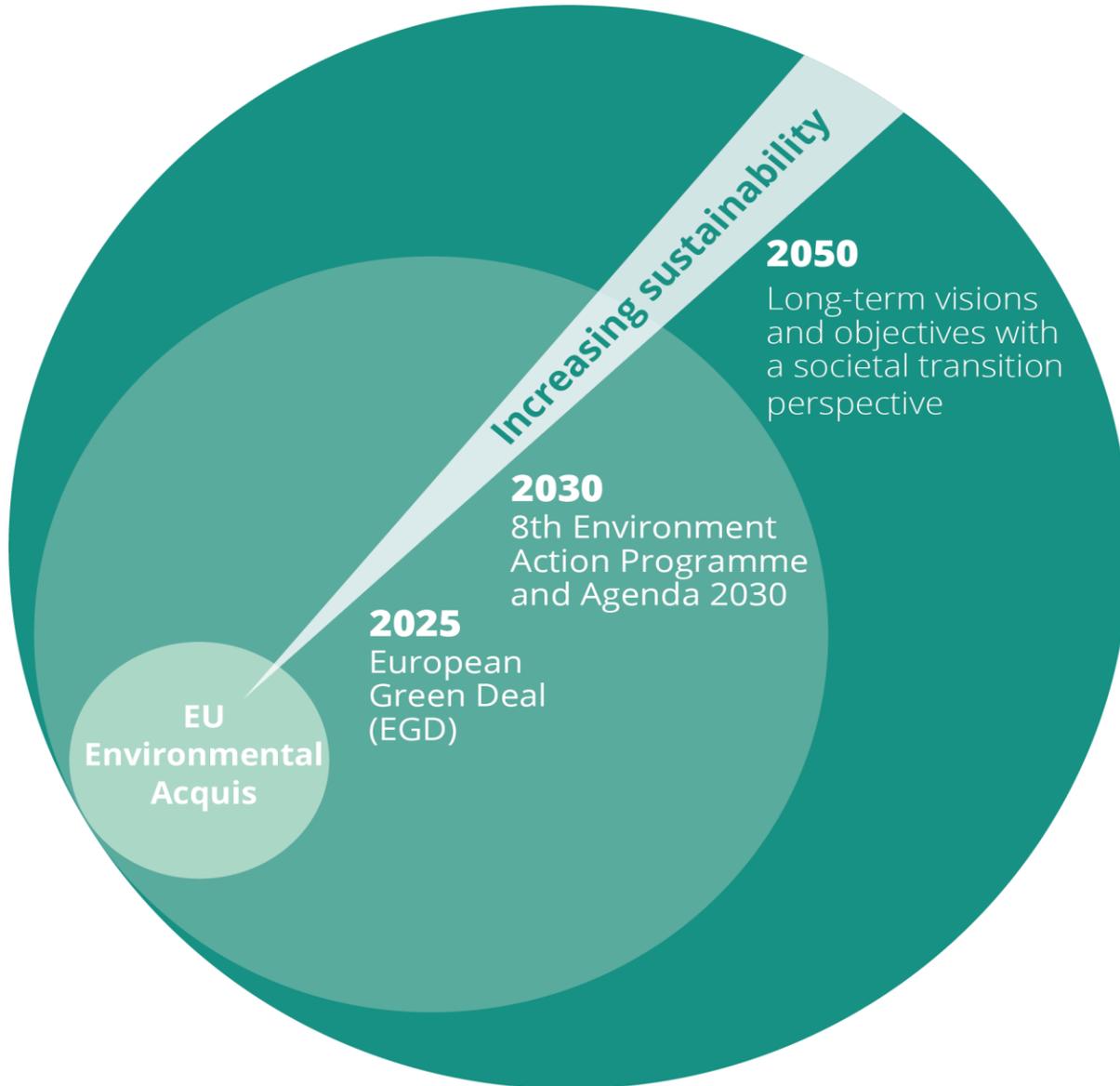
- **Urgent** challenge
- The EGD will **accelerate** ... the transition needed in all sectors
- More ambitious climate action in coming decade: **rapid phasing out** of coal and decarbonizing gas.
- To be ready in 2050, decisions and **actions need to be taken in the next 5 years**
- The transformation (towards a circular economy) is taking place a **too slow pace**.
- The EGD will ... **accelerate** the EU's **industry transition**
- **Breakthrough** technologies in Key industrial sectors **by 2030**. E.g. zero-carbon steel making.
- Rate of renovation of **buildings** is **too slow** and needs to double.
- **Accelerating** the shift to sustainable **mobility**
- ...

Mechanisms to speed-up of the transition

- Institutional set-up fit for purpose
- Phasing-out of non-sustainable practices
- The role of investments and capital: sustainable finance
- Digital society
- Urban setting
- Race-to-the-top logic
- Undertanding and cost of the 'new normal'
- ...

Implications for knowledge creation, organisation and use

A new policy landscape



2050

Long-term visions and objectives with a societal transition perspective

Ecosystems are restored, resilient, and adequately protected
(EU Biodiversity Strategy)

Climate resilience
(Climate Adaptation Strategy)

Climate neutrality
(EU Climate Law)

Living well, within planetary boundaries
(8th EAP)

A regenerative economy that gives back to the planet more than it takes
(8th EAP)

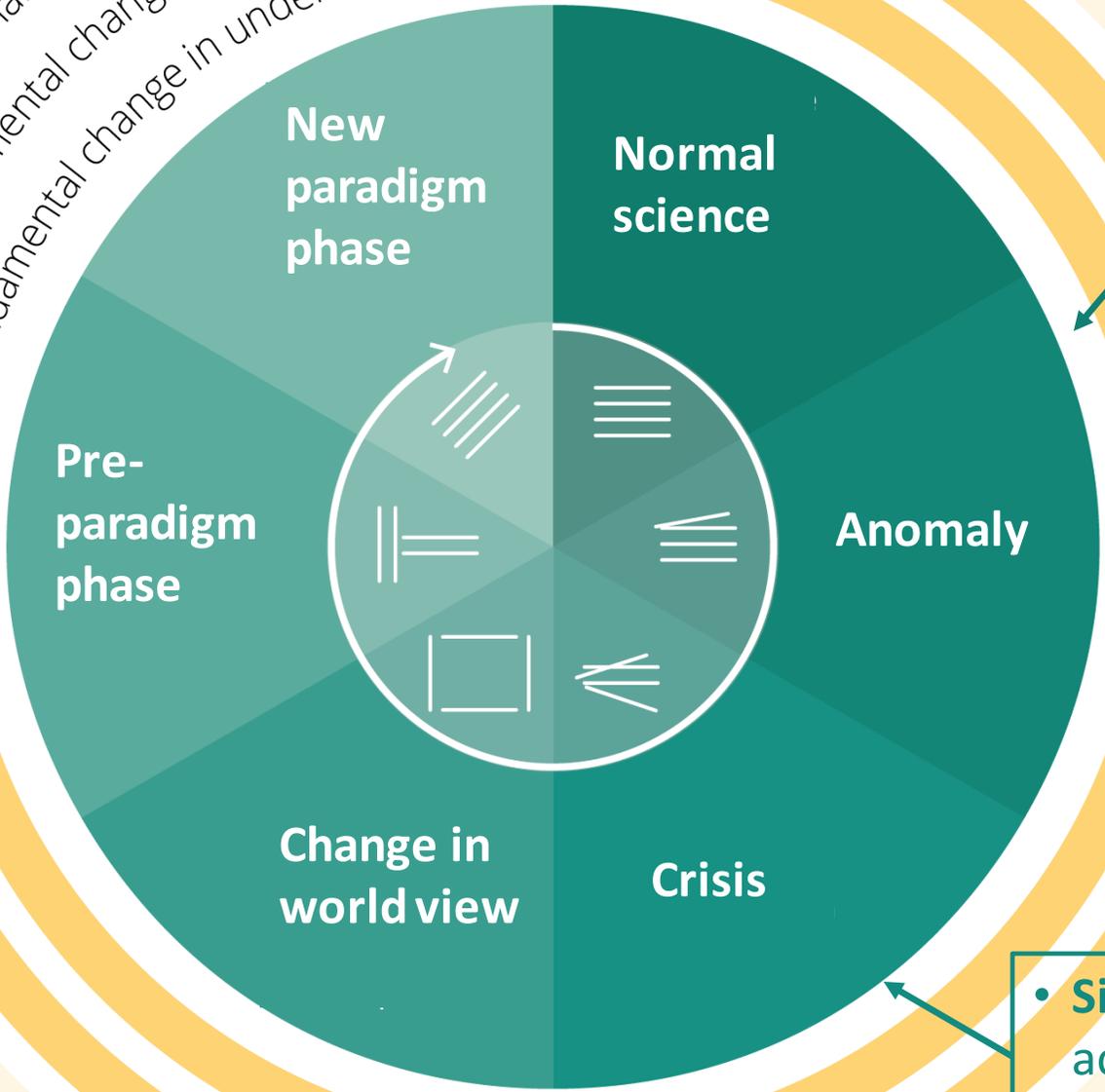
A toxic-free environment
(Zero Pollution Action Plan)

A just transition /
Leaving no one behind
(EGD)

A new paradigm?

THOMAS S. KUHN
THE
STRUCTURE OF
SCIENTIFIC
REVOLUTIONS

A fundamental change in knowledge?
A fundamental change in policy
A fundamental change in understanding



- **1970s:** specific regulatory interventions
- **1980s:** integration of environmental concerns into sectoral policies
- **Late 1990s:** focus on sustainability; interlinkages between environment, economy, society

- **2020s:** new concepts in policy, e.g.
 - green, low-carbon, circular, blue and bio economies
 - natural capital
 - transitions agenda

- **Since 2010:** acknowledgement current trajectories unsustainable

Understanding wicked problems



Based upon Rittel and Webber (1973)

A paradigm to deal with Super-wicked problems?

Super-wicked problems have the following additional characteristics:

1. Time is running out.

2. Policies discount the future irrationally.

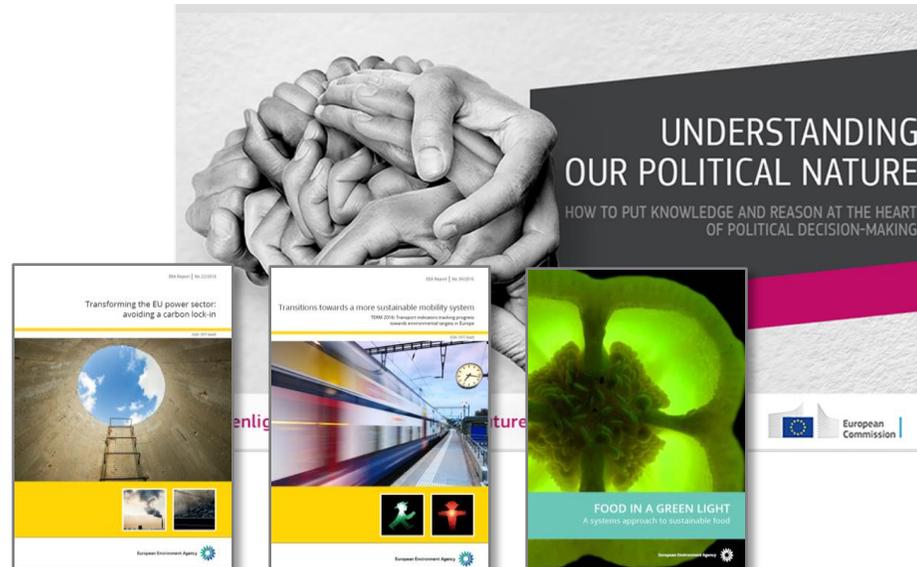
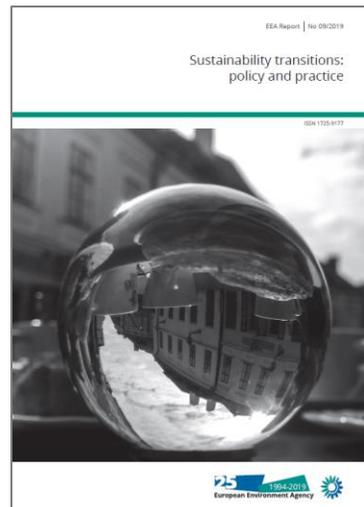
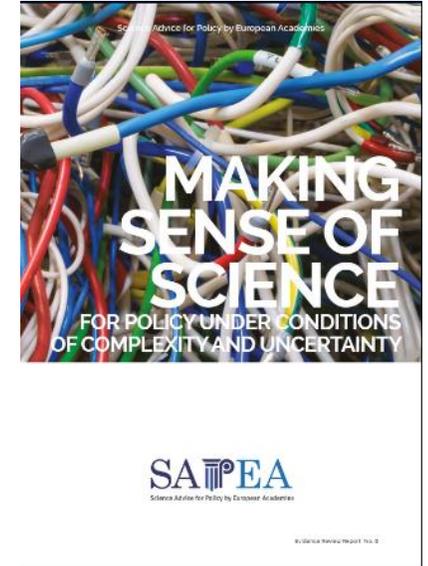
3. Those seeking to solve the problem are also causing it.

4. No central authority.

(Kelly Levin, Benjamin Cashore, Graeme Auld and Steven Bernstein, 2012, *Policy Sciences*)

Developing solutions-oriented knowledge - how

- Developing **knowledge that reflects** the nature of (super-wicked) **problems**: systemic; drivers; uncertain; agency; time; scale; ... transition dynamics
- Knowledge **co-creation** at the science-policy-society interface
- Knowledge **use**: engagement with academic communities and policy audiences



Expansion of sustainability science needed for the SDGs, 2019

Dominant research modes are not enough to guide the societal transformations necessary to achieve the 2030 Agenda. Researchers, practitioners, decision makers, funders and civil society should work together to achieve universally accessible and mutually beneficial sustainability science.

Peter Messerli, Eun Mee Kim, Wolfgang Lutz, Jean-Paul Moatti, Katherine Richardson, Muhammad Saidam, David Smith, Parfait Eloundou-Enyegue, Ernest Folj, Amanda Glassman, Gonzalo Hernandez Licona, Endah Murniningtyas, Jurgis Kazimieras Staniskis, Jean-Pascal van Ypersele and Eeva Furman



Knowledge for action

Selected areas for action



Data, monitoring & indicators
Lock-ins & enablers; synergies & trade-offs
Transformation pathways
Societal systems & nature-based solutions

Key actors



Policy makers & public authorities
Research & education communities
Business
Citizens & boundary organisations

Knowledge system features



Innovative & collaborative
Open-access
Single, inter- & trans-disciplinary
Knowledge co-production & learning by doing

Knowledge system outcomes



Innovative & Integrated
Enhanced interface: science-policy-society
Action-oriented
Capacities & skills

Developing solutions-oriented knowledge – what

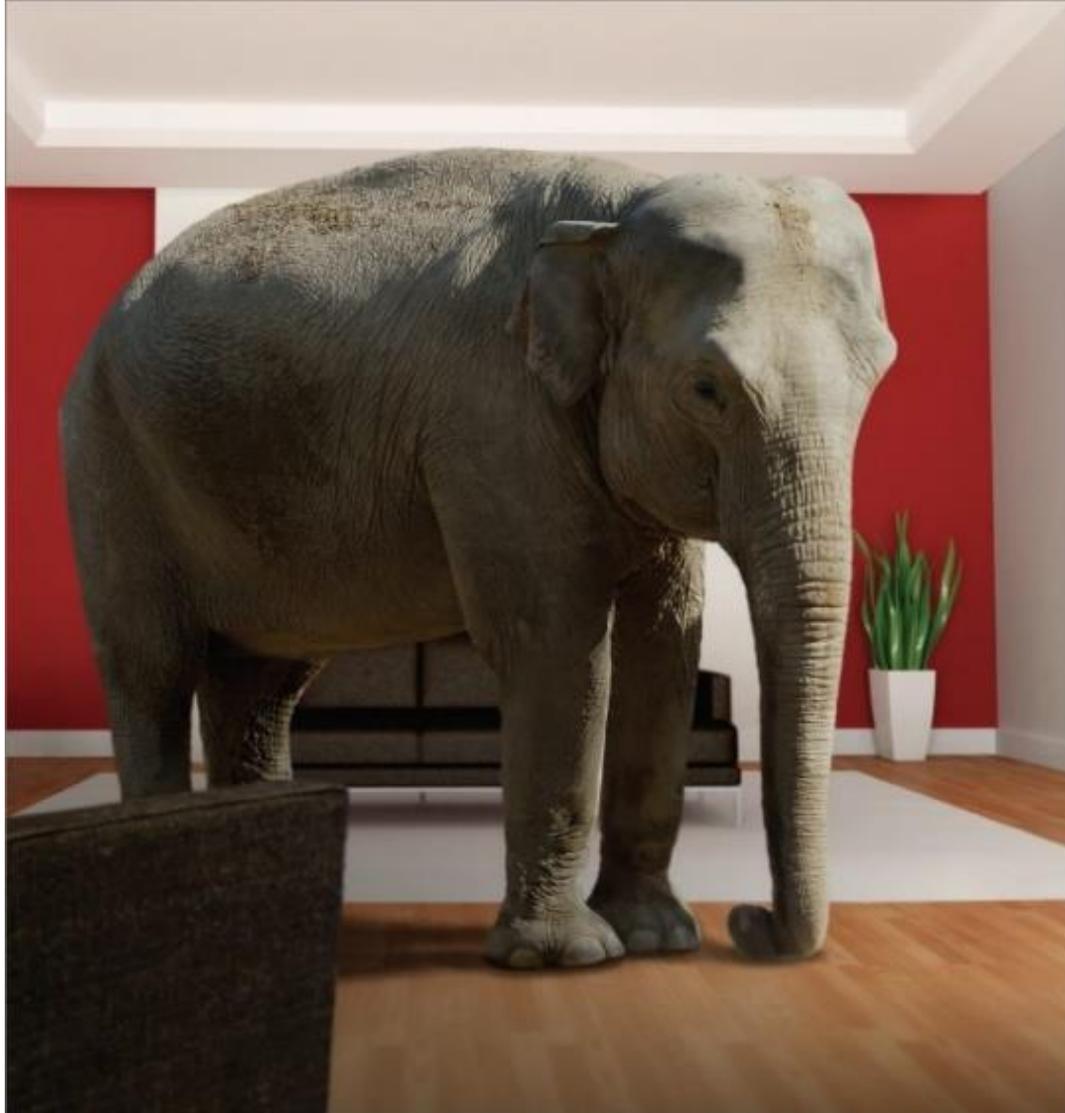


An EU knowledge strategy could help **create, organise, communicate, and use diverse** knowledge:

- **Complex** environmental change and **systemic** risks;
- **Societal systems** – actors, lock-ins, trends, etc.
- **Transition dynamics** in production and consumption systems
- **Integration:** methods, technology (data intelligence), understanding
- **Future:** foresight, modelling, scenario's, expertise
- **Early warning** systems: harms and opportunities
- **Practice-based evidence:** innovations, impacts, successes, failures at various levels
- **New knowledge skills,** infrastructures, institutions



Space for **fundamental debate**: “Narratives for change”



- Growth without Economic Growth
(Living well within the limits of the planet)
- Governing Innovation for Sustainability
- Beyond Fear: Early Lessons for Sustainability from COVID-19
- Agriculture as care
- ...

Communicating complexity, risk and uncertainty

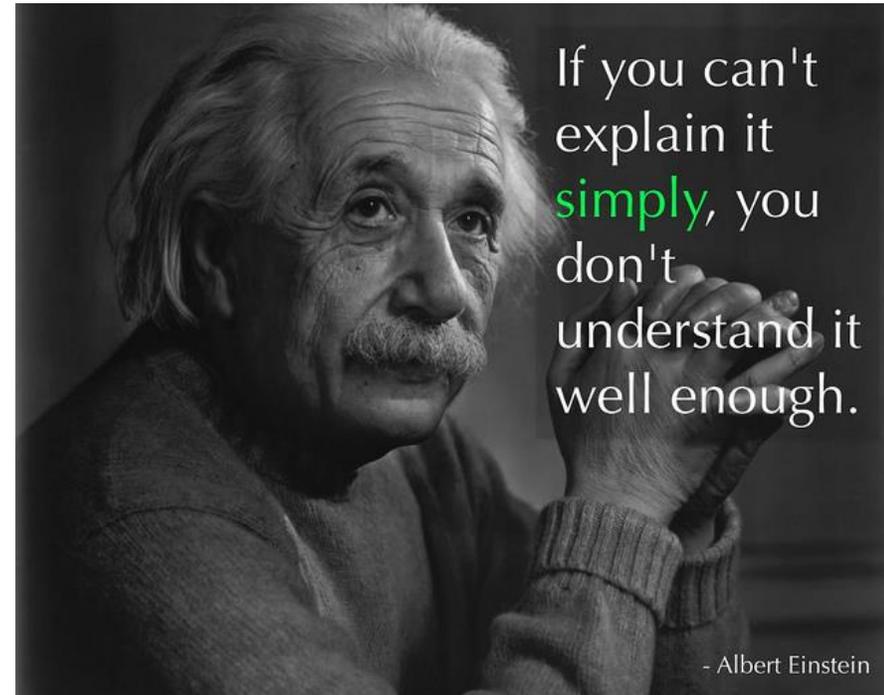
$$\Delta E \approx \frac{hc}{\lambda}$$

The product of these two uncertainties is

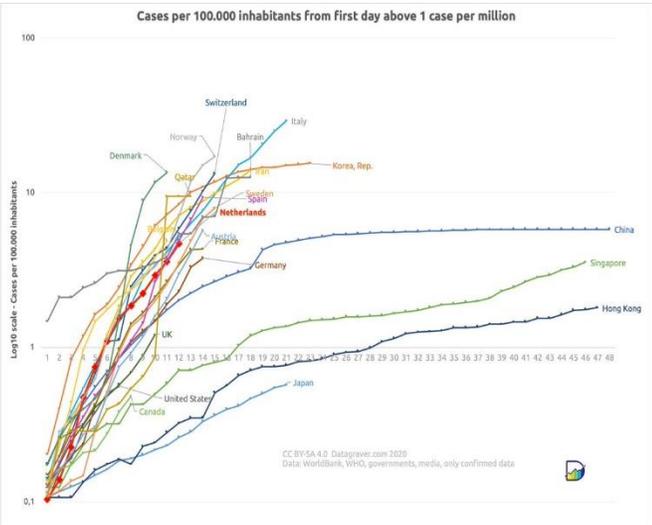
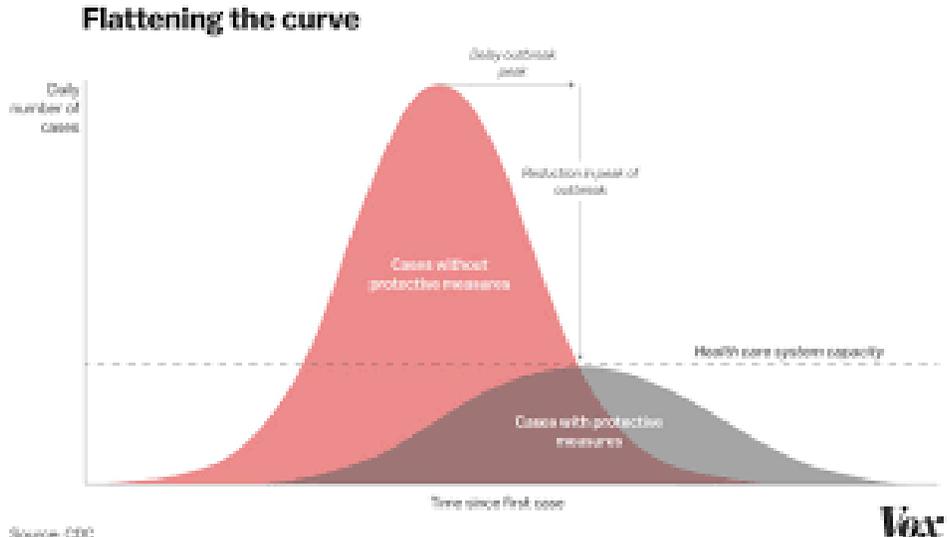
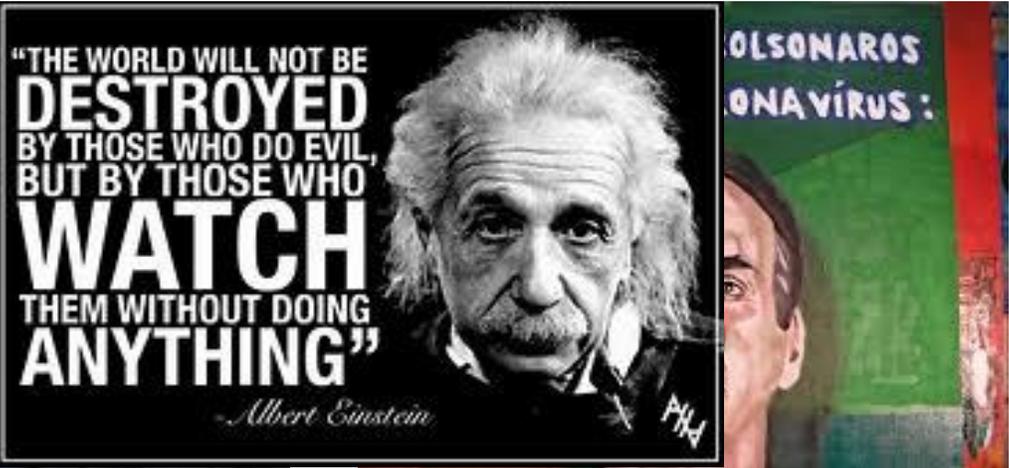
$$(\Delta E)(\Delta t) \approx \left(\frac{hc}{\lambda}\right)\left(\frac{\lambda}{c}\right) \approx h.$$

A more careful calculation gives

$$(\Delta E)(\Delta t) \approx \frac{h}{2\pi}.$$



Reflecting on the relation between science and policy



European Green Deal: a paradigm shift in politics/policy?

- First **climate-neutral** continent
- **Biodiversity**
- New **Circular**
- **Zero pollution**
- **Farm to fork**
- **Just transition**
- **Sustainable**
- **Future ready**

Yes, ...

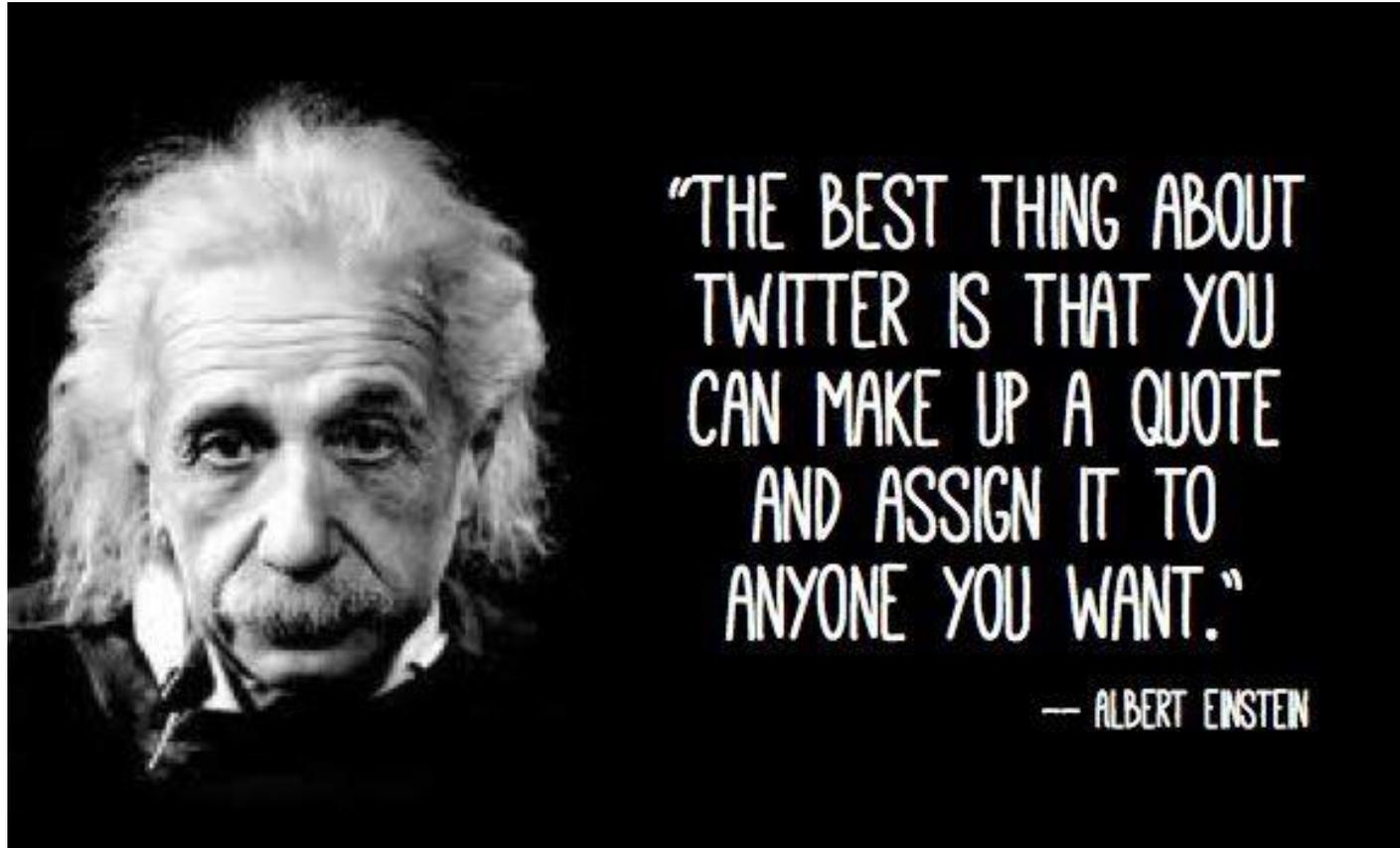
... if ...

... but ...

... and ...

European
Green Deal
European Commission





Thank you

