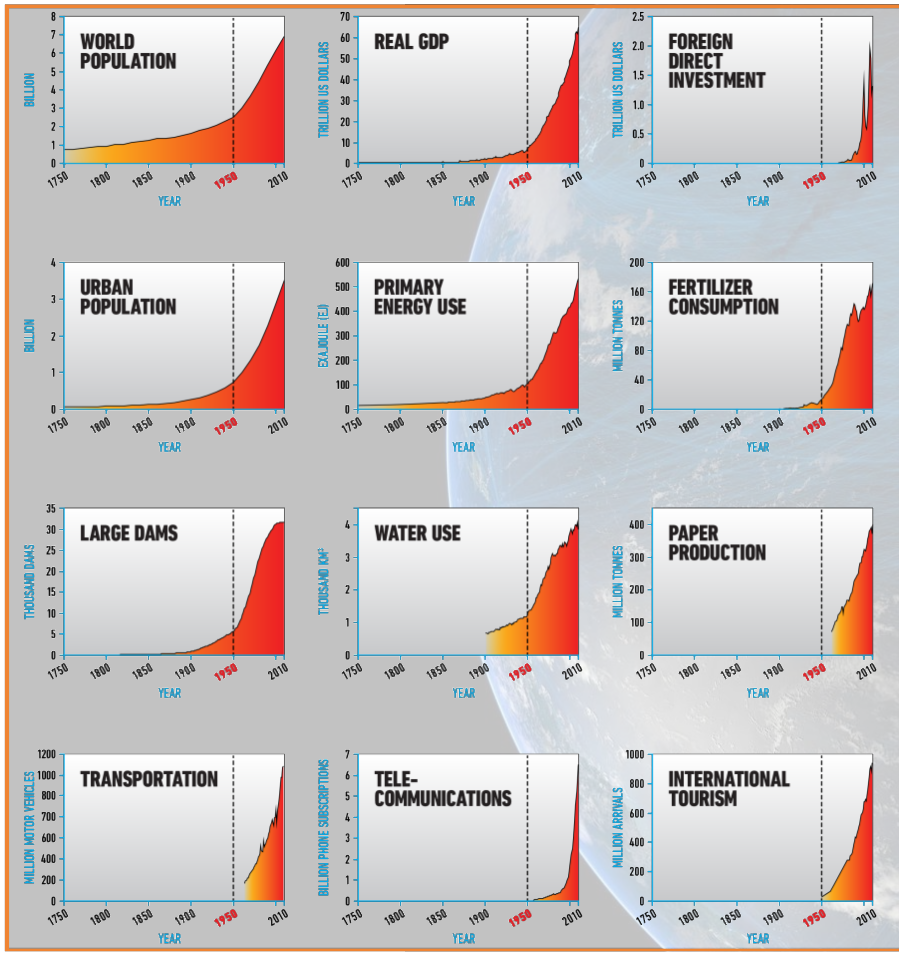
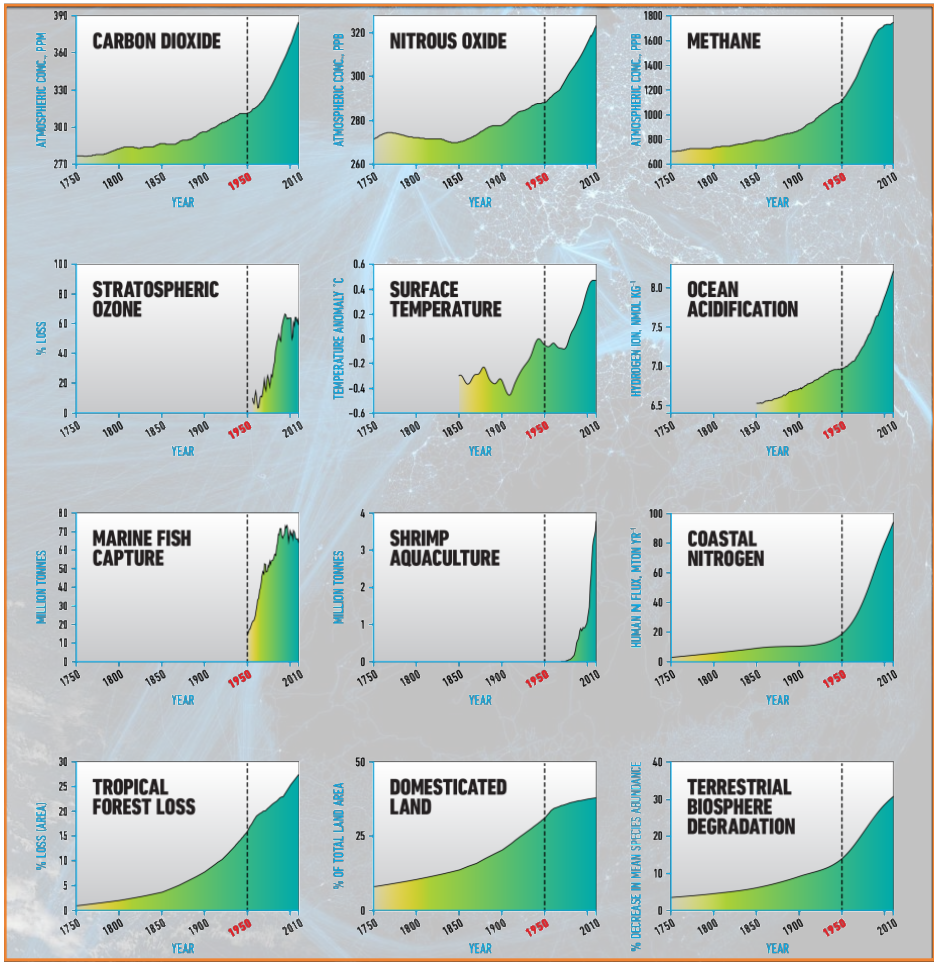
Missions: directing R&I towards sustainability

Pavel MISIGA
Circular Economy and Bio-based Systems
Directorate-General for Research and Innovation
European Commission

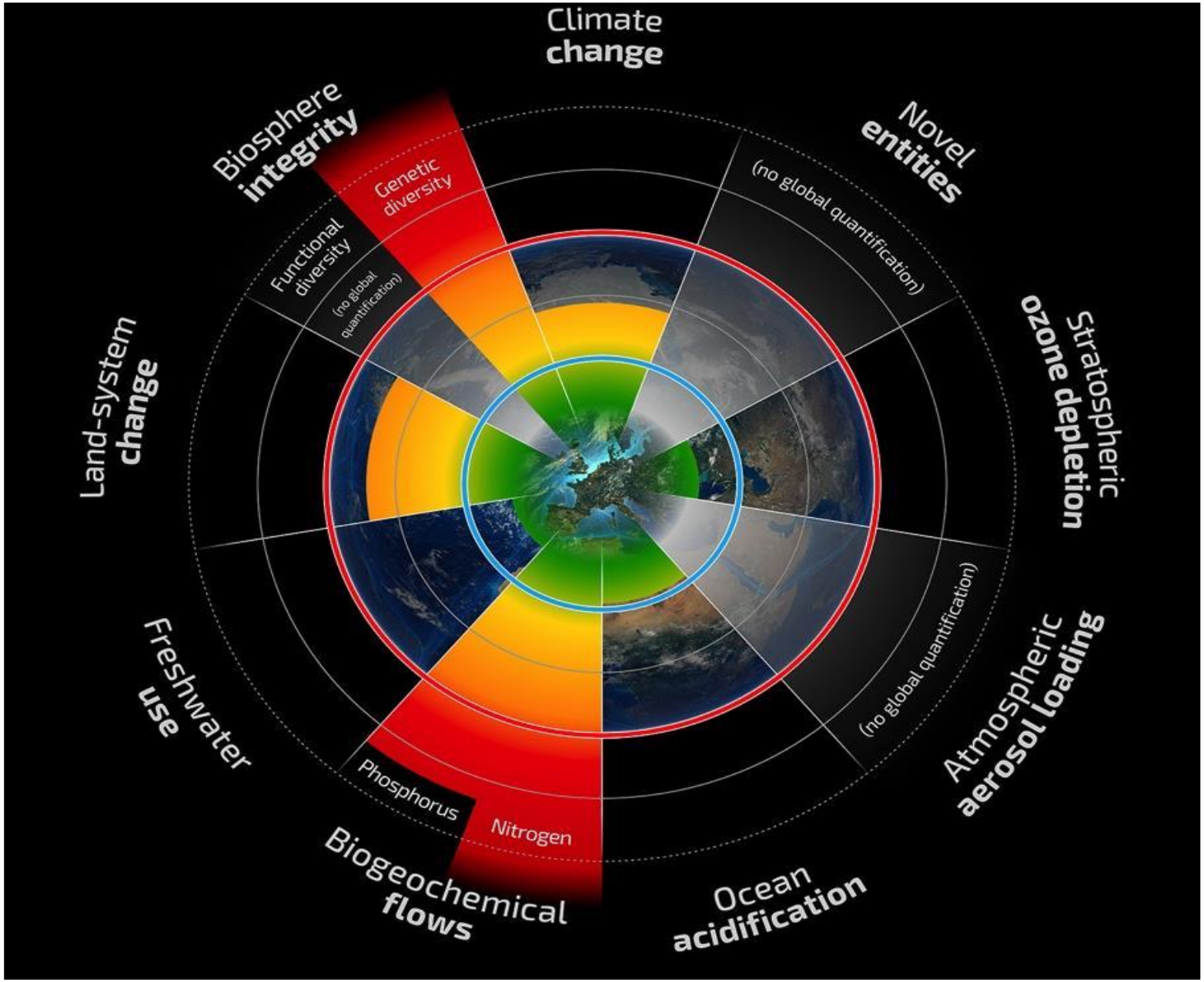
Great acceleration





Source: Rockström, 2018

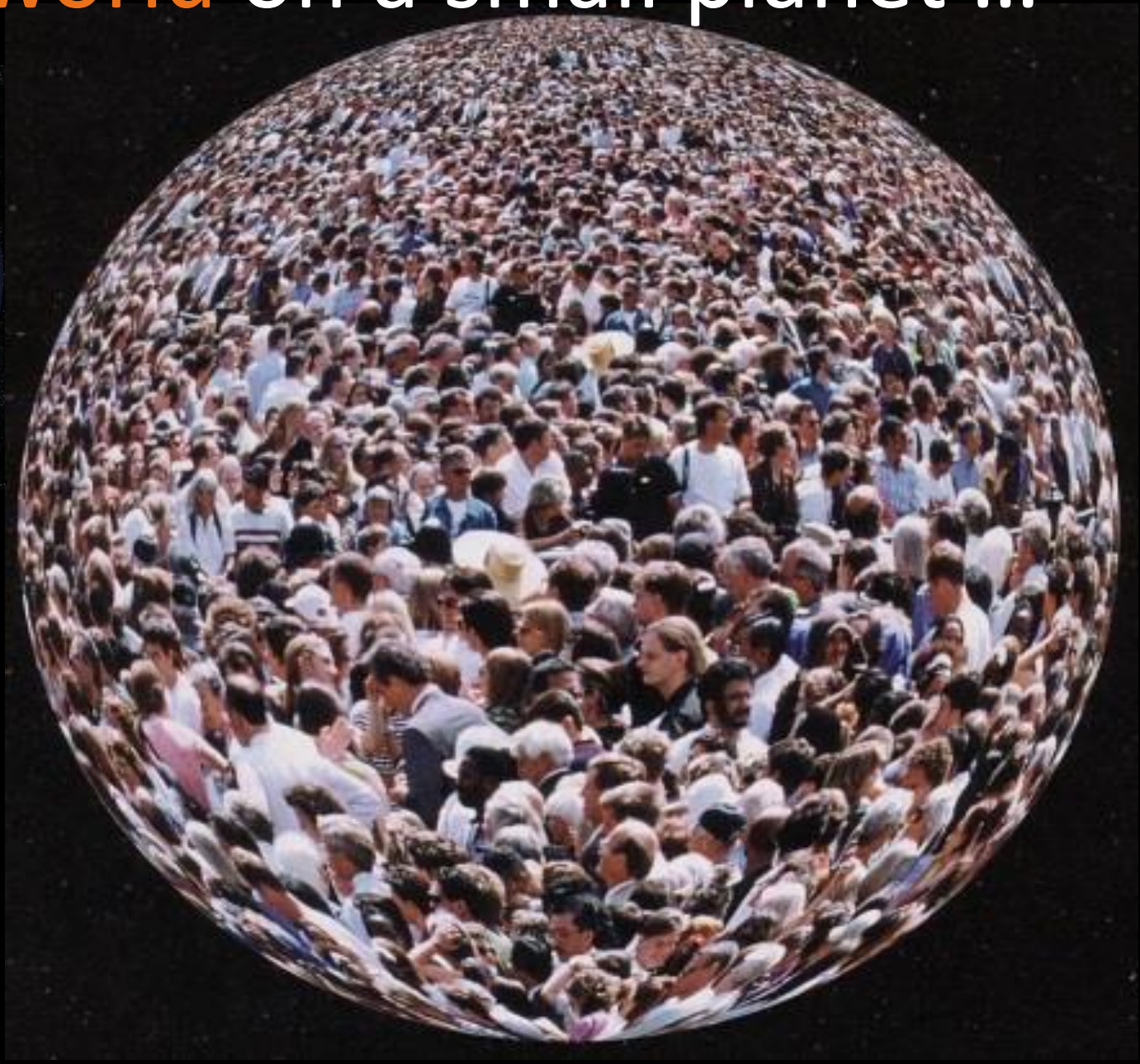
Planetary boundaries crossed

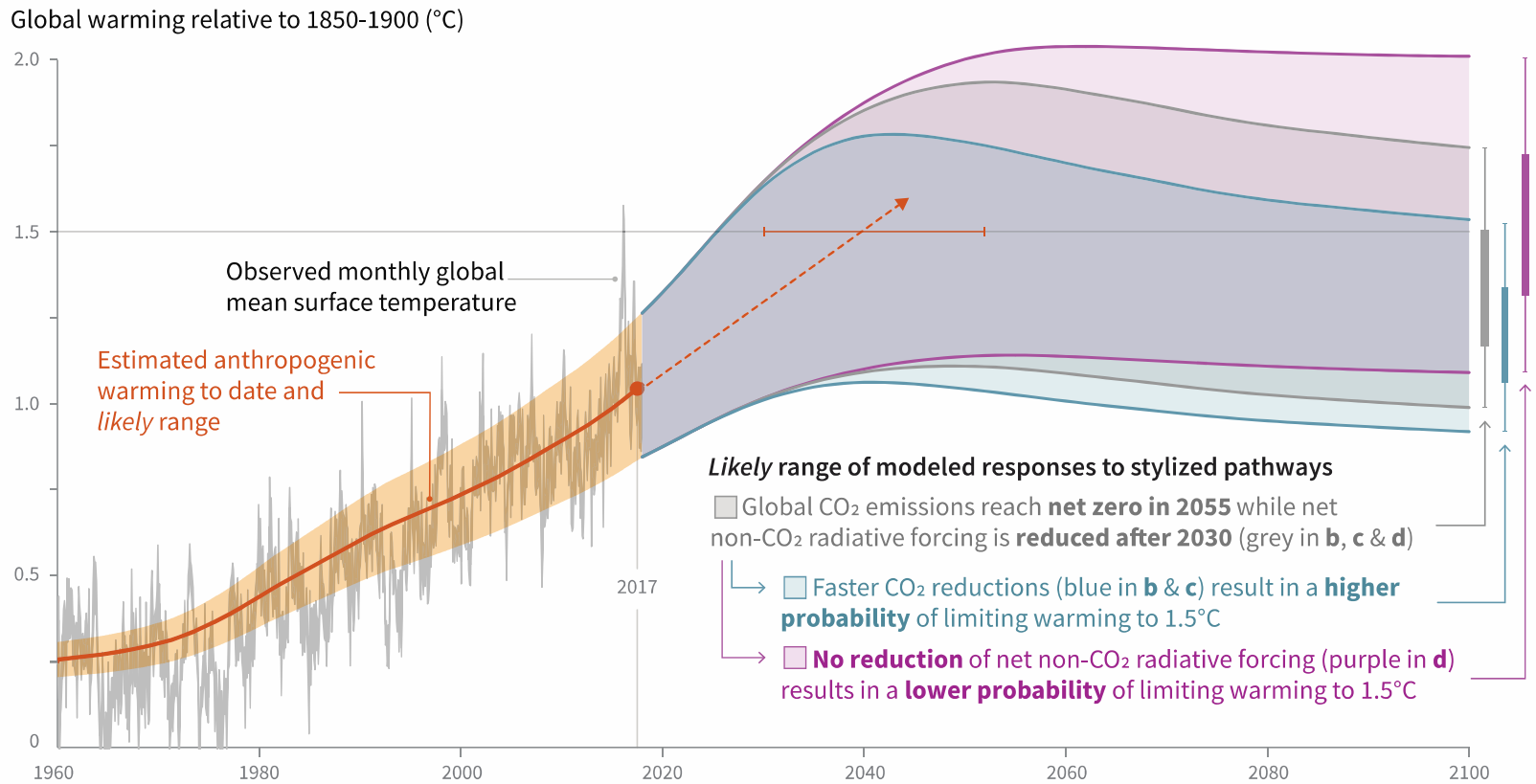


Source: Rockström, 2018

From a small world on a large planet …

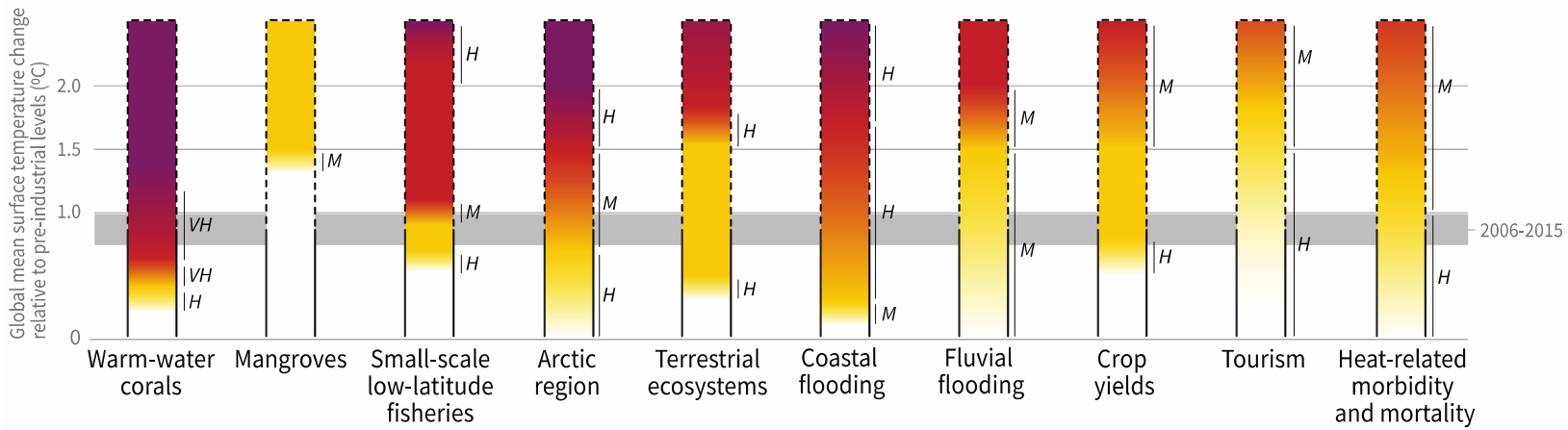
To a large world on a small planet …

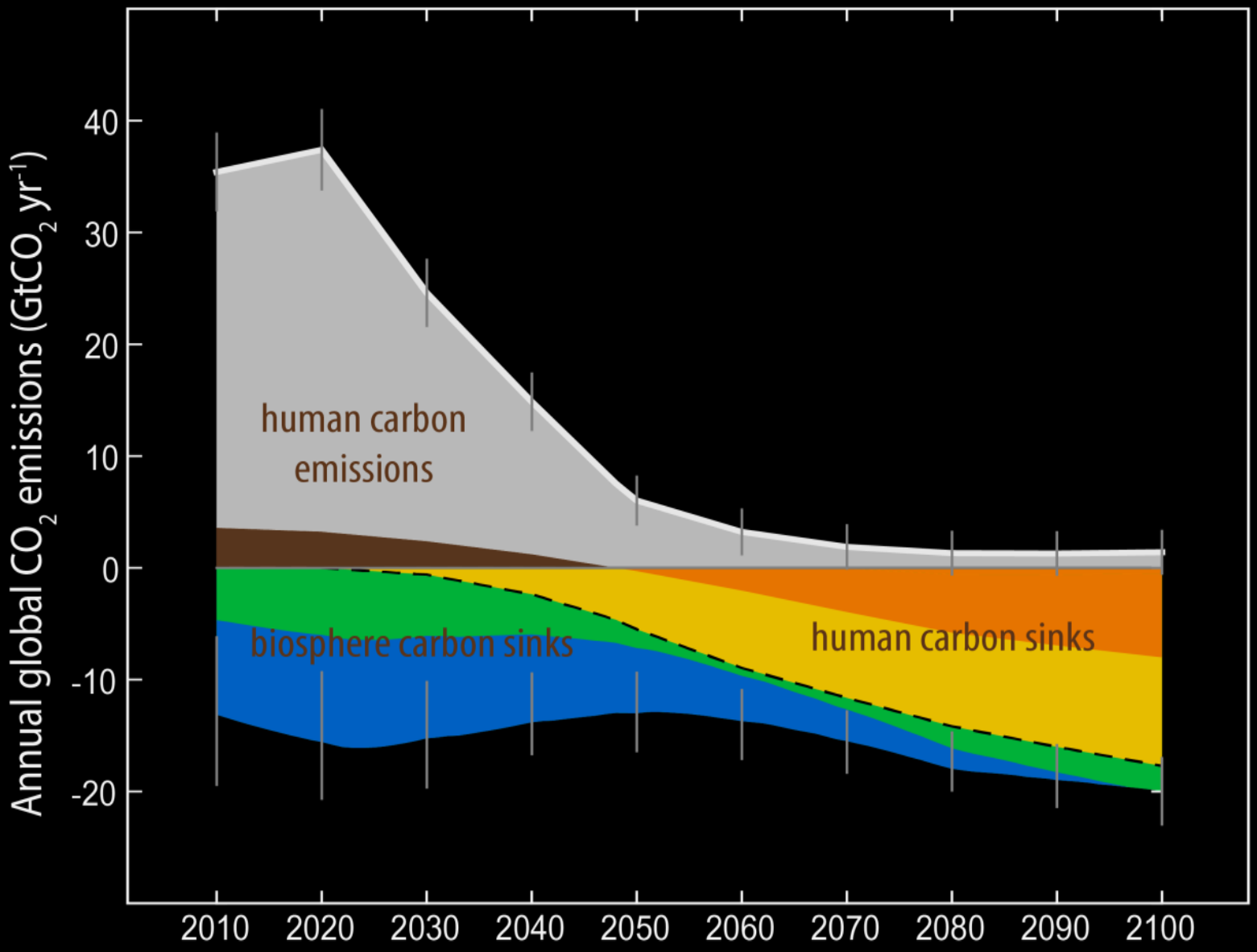




Impacts and risks for selected natural, managed and human systems

Source: IPCC, 2018





anthropogenic CO_2 emissions (gross)

- fossil fuel and industry
- land use and land-use change

anthropogenic CO_2 removals

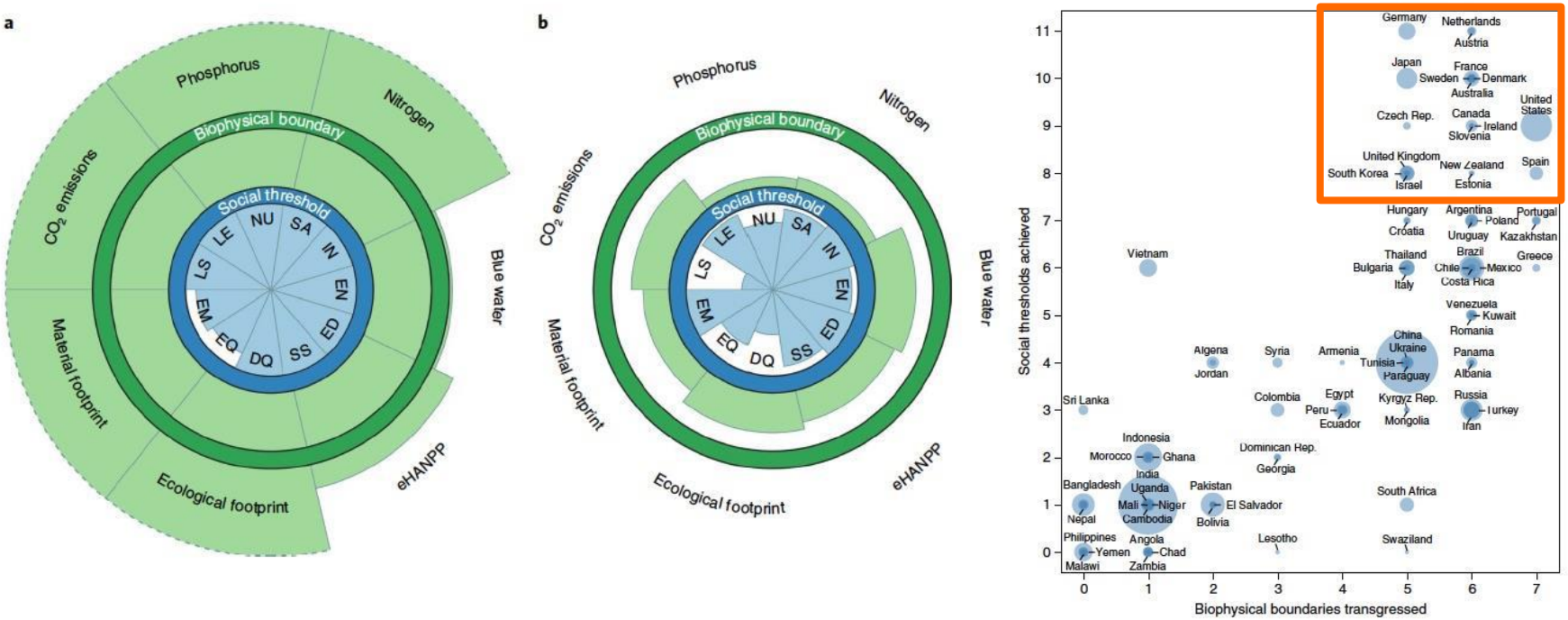
- land use and land-use change
- engineering CO_2 sink (BECCS)

biosphere carbon sink

- Land carbon sink
- Ocean carbon sink

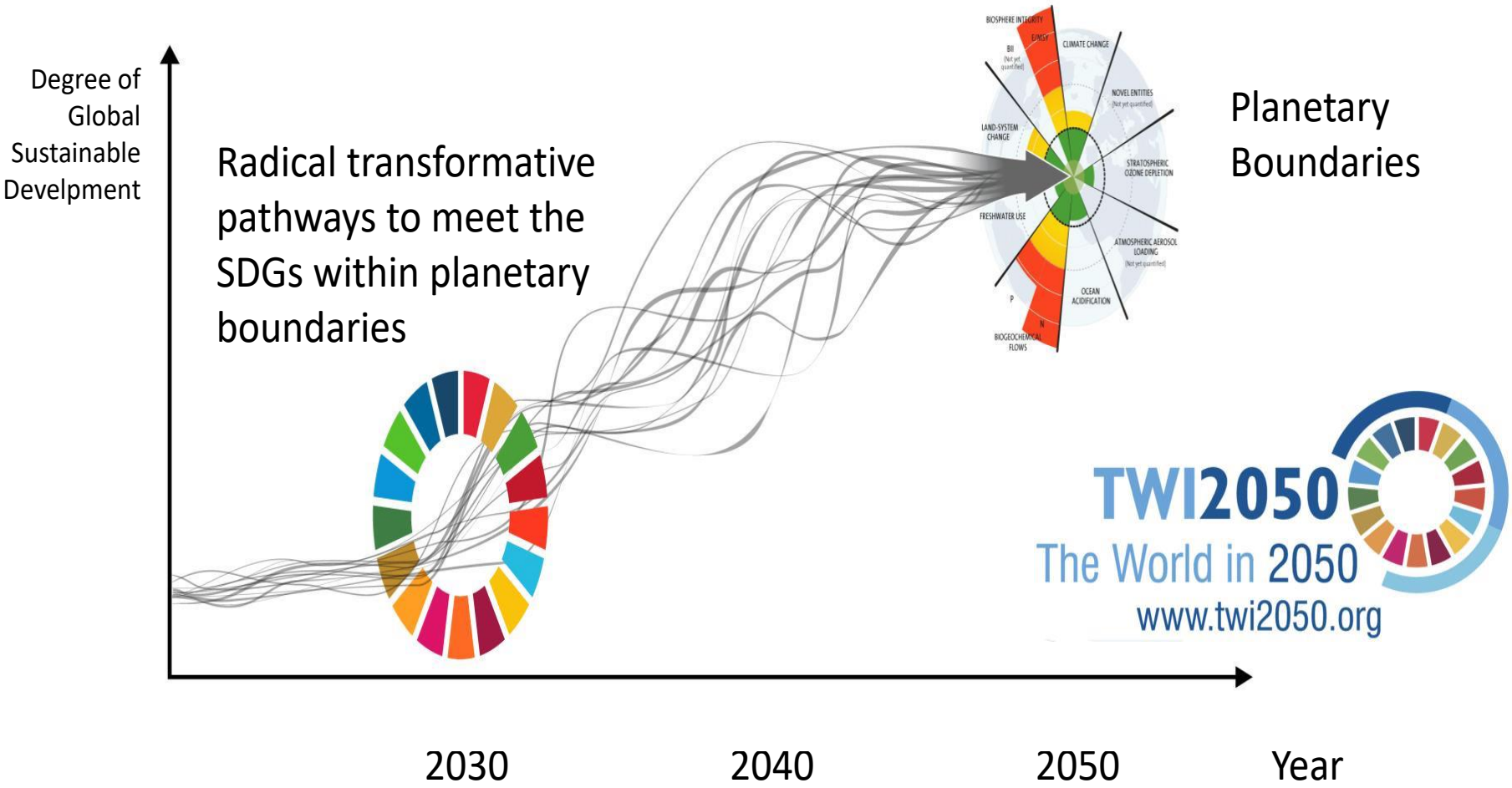
SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

A good life for all within boundaries



O'Neill, D., et al. (2018). A good life for all within planetary boundaries.
Nature Sustainability, 1, pp. 88-95.

The World In 2050



New political commitments

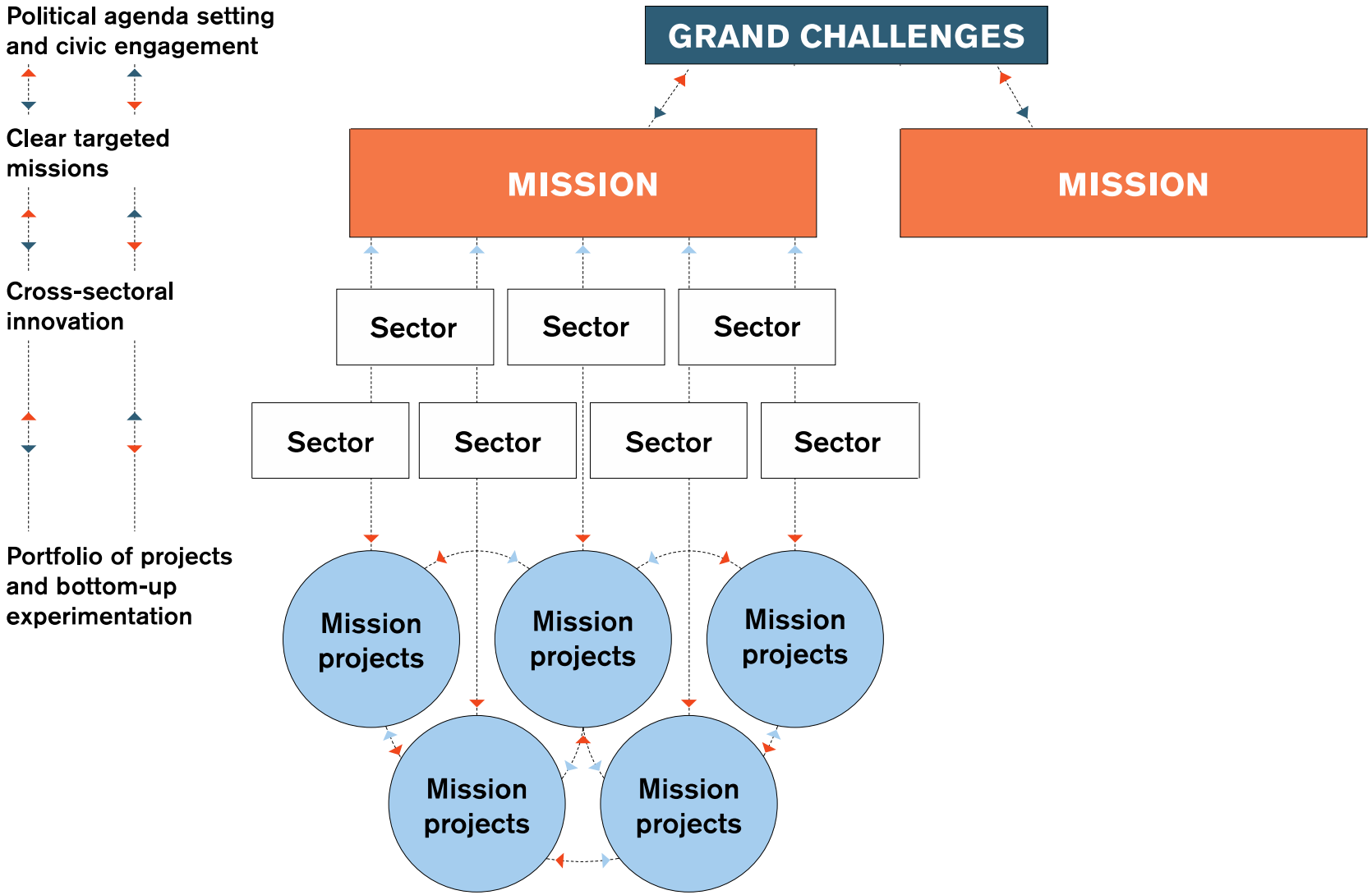
Ursula von der Leyen: A Union That Strives for More

- European Green Deal
  - Climate neutrality
  - Biodiversity strategy
  - Circular economy
  - Green financing
  - Farm to Fork: Sustainable food system
  - Zero pollution
  - Just transition
  - International leadership

The role of R&I in societal transitions

- Critical role for achievement of objectives in the given timeframe
- Need for system innovation
- Directionality R&I policy

R&I Missions


Political agenda setting and civic engagement
Clear targeted missions
Cross-sectoral innovation
Portfolio of projects and bottom-up experimentation
GRAND CHALLENGES
MISSION
MISSION
Sector
Sector
Sector
Sector
Sector
Sector
Sector
Mission projects
Mission projects
Mission projects
Mission projects
Mission projects

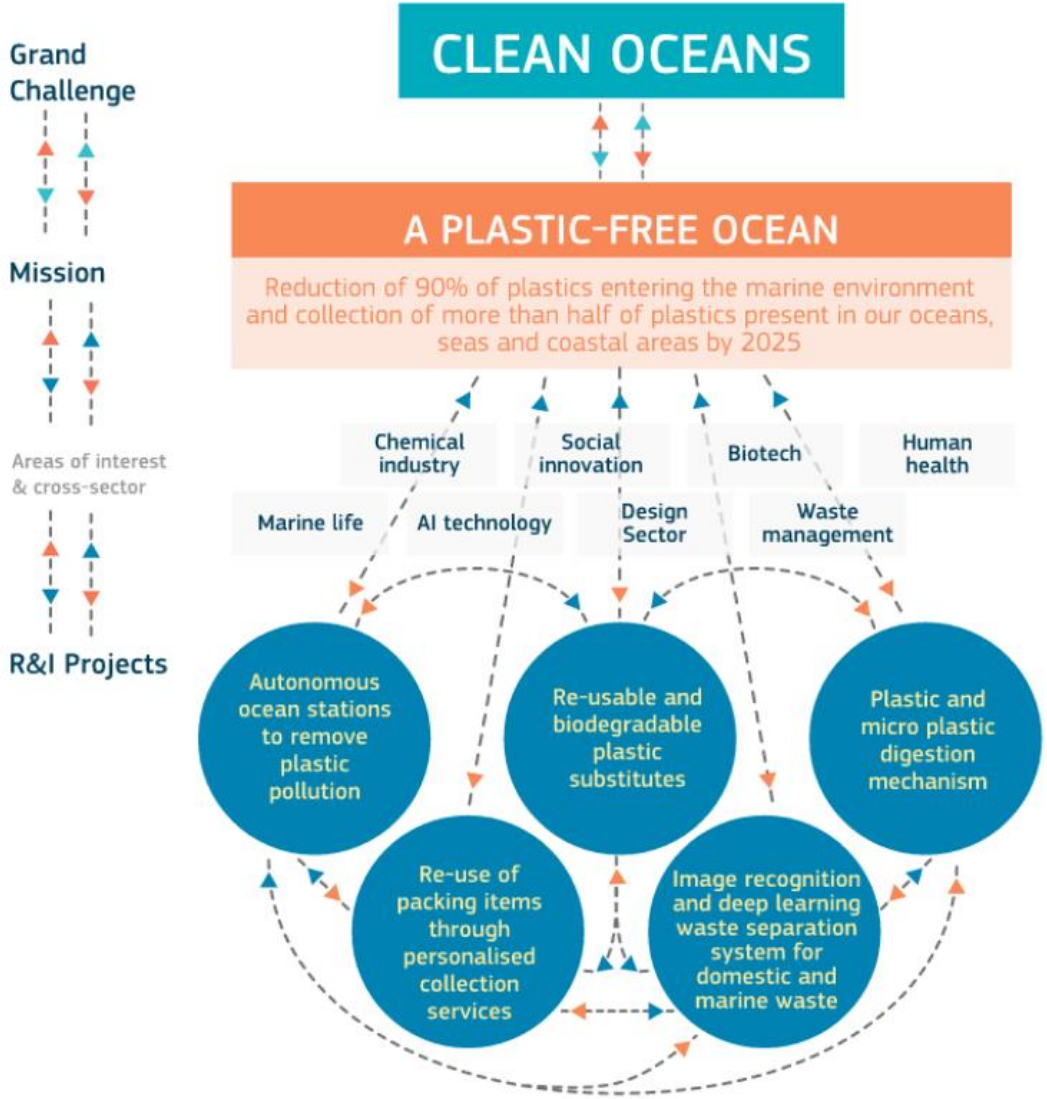
Principles

- Bold, inspirational with wide societal relevance
- A clear direction: targeted, measureable, and time-bound
- Ambitious but realistic research and innovation actions
- Cross-disciplinary, cross-sectoral, and cross-actor innovation
- Multiple, bottom-up solutions

What is the change?

- From picking winners to picking the willing
- Engagement
- From fixing markets to actively co-shaping
- From fearing failure to welcoming experimentation
- From a focus on quantity of public finance to a focus on the quality
- From de-risking to sharing both risks and rewards

Example: Plastic free oceans



Source: Mazzucato (2018a).

Example: Water scarcity

Water management/ governance innovation	Water efficiency in water using sectors	Water resources enhancement
• Water accounts • Water allocation systems • Economic instruments/ incentives • Ecological flow • Monitoring and enforcement	• Agriculture • Energy • Industry • Utilities/ urban water systems	• Retention enhancement • Nature-based solutions for water retention and infiltration in urban areas • New sources (condensation)

Possible implications for PRIMA

- Set the objective in terms of transition
- Gradual shift from singular innovation to system innovation
- Follow innovation along the life cycle
- Gradual shift from lower to higher TRL
- Cross-sectoral/nexus calls to exploit synergies
- Maintain support/investment in long-term
- Collaboration to broaden the experimentation base and create new synergies

Thank you for your attention

pavel.misiga@ec.europa.eu