

# **Sustainability impact assessment of major public investment projects**

Joachim H. Spangenberg, Dr. rer. pol.  
Helmholtz Centre for Environment Research UFZ  
Germany



**The 5th Concept Symposium on Project Governance**  
**Valuing the Future - Public Investments and Social Return**  
20. – 21. September 2012

Symposium web-site: <http://www.conceptsymposium.no/>  
Concept Research Programme: <http://www.concept.ntnu.no/english/>

# Sustainability Impact Assessment of major public investment projects

Dr. Joachim H. Spangenberg

Helmholtz Centre for Environmental Research UFZ  
Dept. Community Ecology, Halle, Germany

Presentation at the  
the 5th Concept Symposium on Project Governance  
“Valuing the Future – Public Investment  
and Social Return”,  
September 20th - 21st, 2012, Losby Gods, Lorenskog (Oslo), Norway

# Sustainable development is

*“development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:*

- **the concept of ‘needs’, in particular the essential needs of the world’s poor, to which overriding priority should be given; and**
- **the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.”**

*WCED 1987, p. 43*

# Sustainable development is

*“a balance seeking process in order to achieve social justice, sustainable economies and environmental sustainability”*

*Aalborg Charter 1994*

- “to ensure sustainable and environmentally sound development” [signatories] “shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters”

*UNECE Aarhus Convention 1998*

**Institutional  
Imperative**  
strengthen  
participation

justice

democracy

care

burden sharing

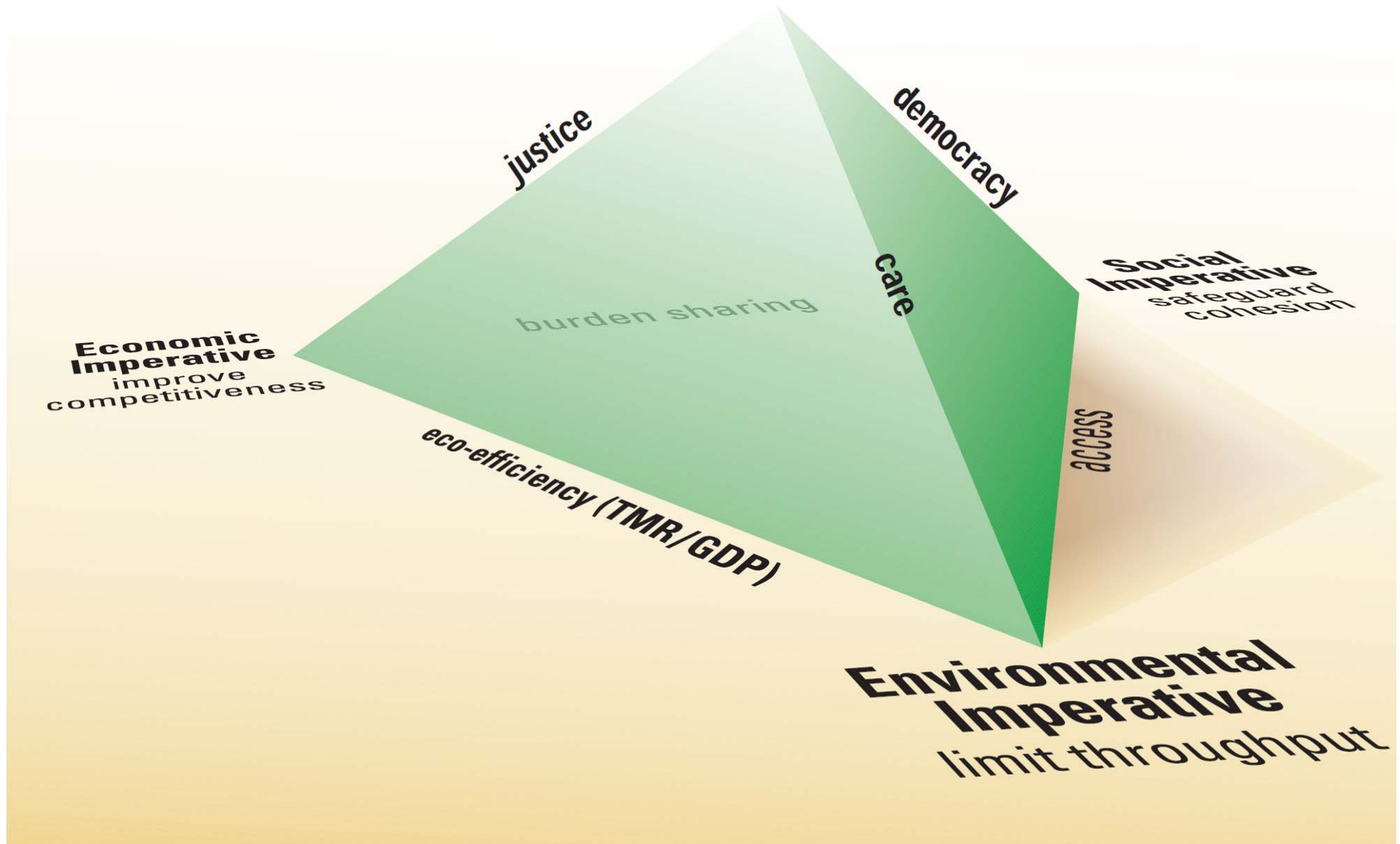
**Economic  
Imperative**  
improve  
competitiveness

eco-efficiency (TMR/GDP)

**Social  
Imperative**  
safeguard  
cohesion

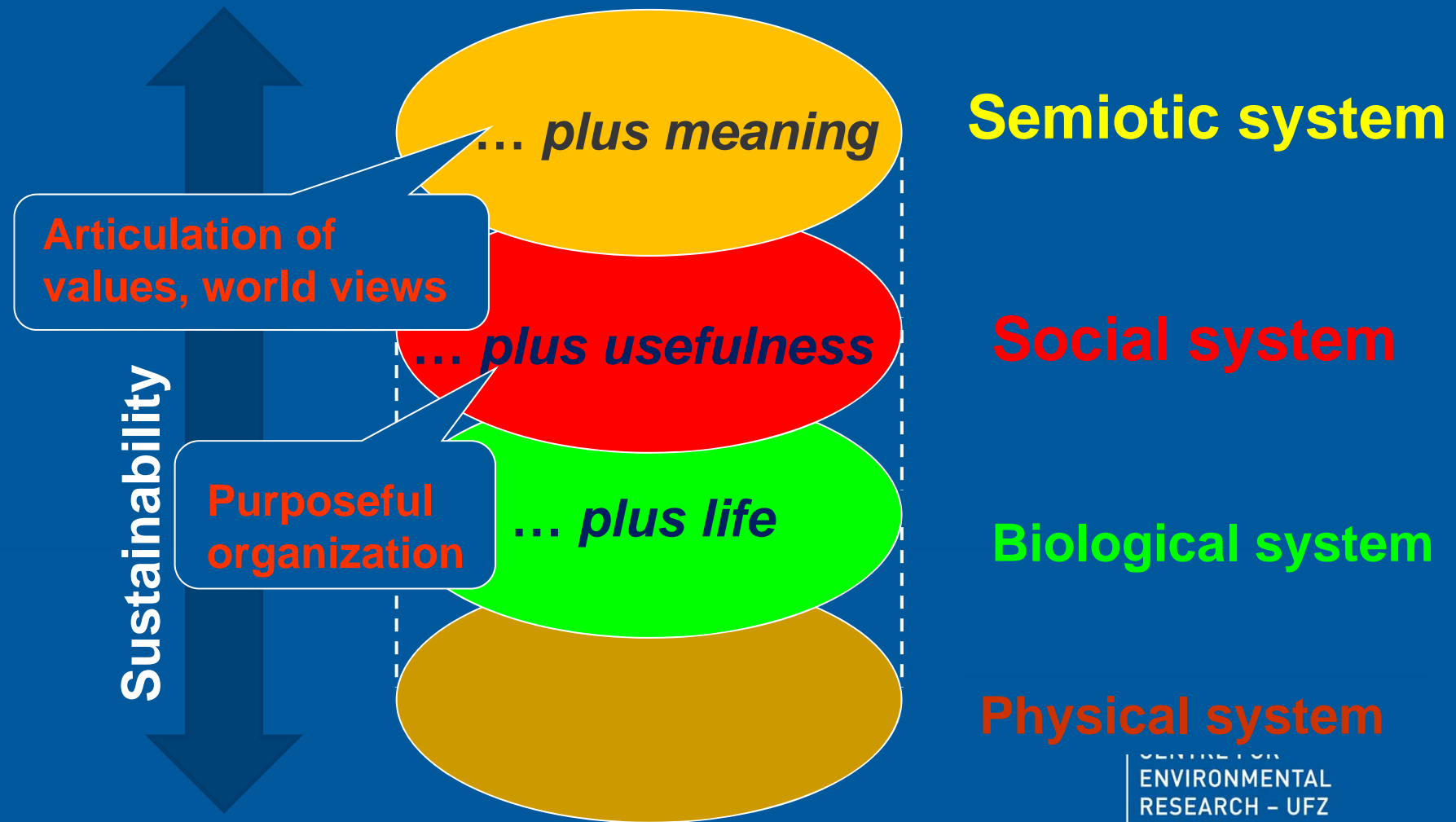
access

**Environmental  
Imperative**  
limit throughput



# Orders of system complexity

After M.A.K Halliday (2005)



CENTRE FOR  
ENVIRONMENTAL  
RESEARCH - UFZ

# Two key governance challenges

1. The delimitation in space  
and time

2. The need for integration  
across the dimensions



# Delimitation in space and time

## In space:

- acceleration and accessibility effects
- competitiveness and identity effects



## In time:

- planning for and against change over 50 years
- planning for future demands and preferences
- life cycle planning: DfS criteria

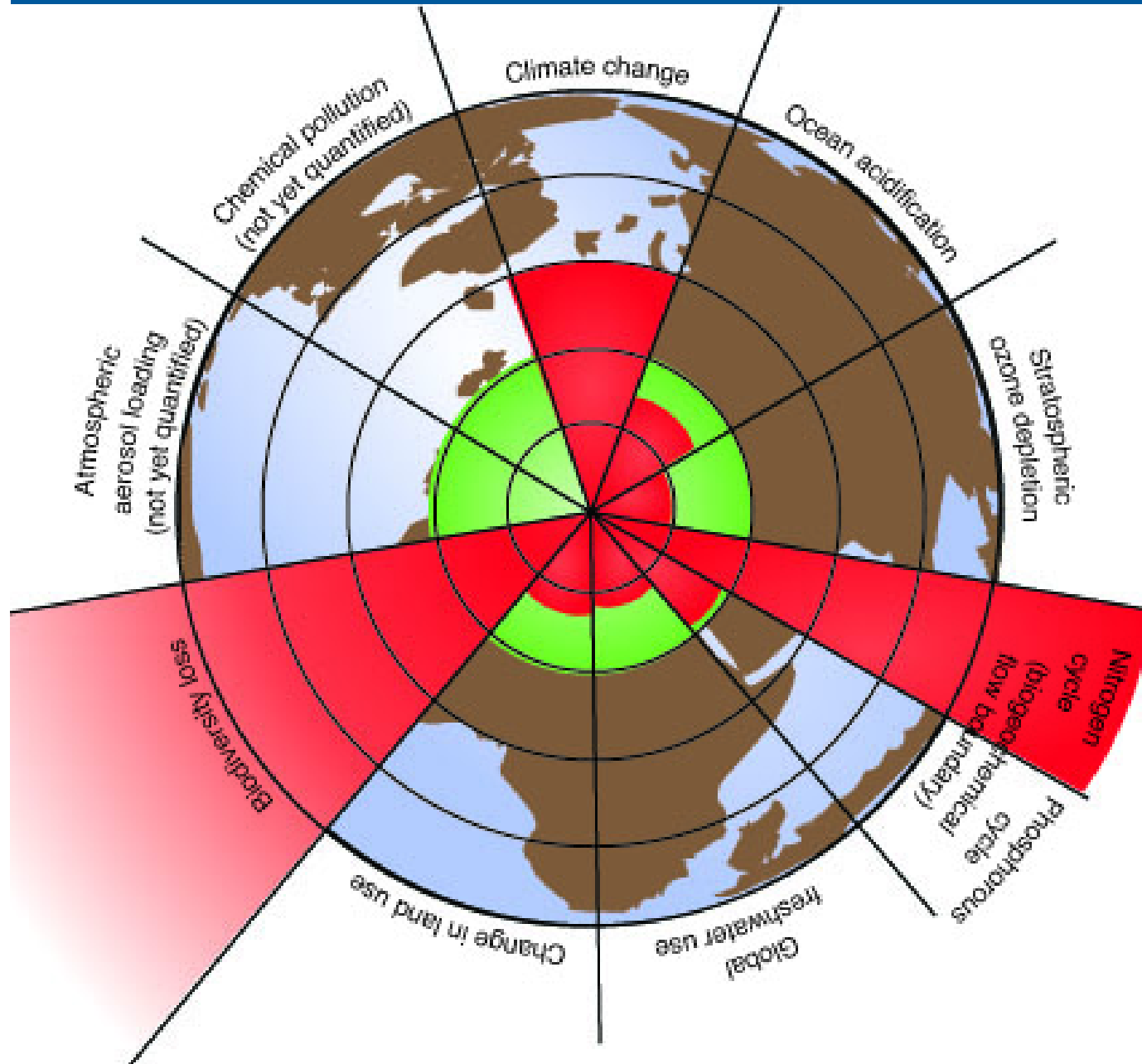


# Planning for and against change over 50 years

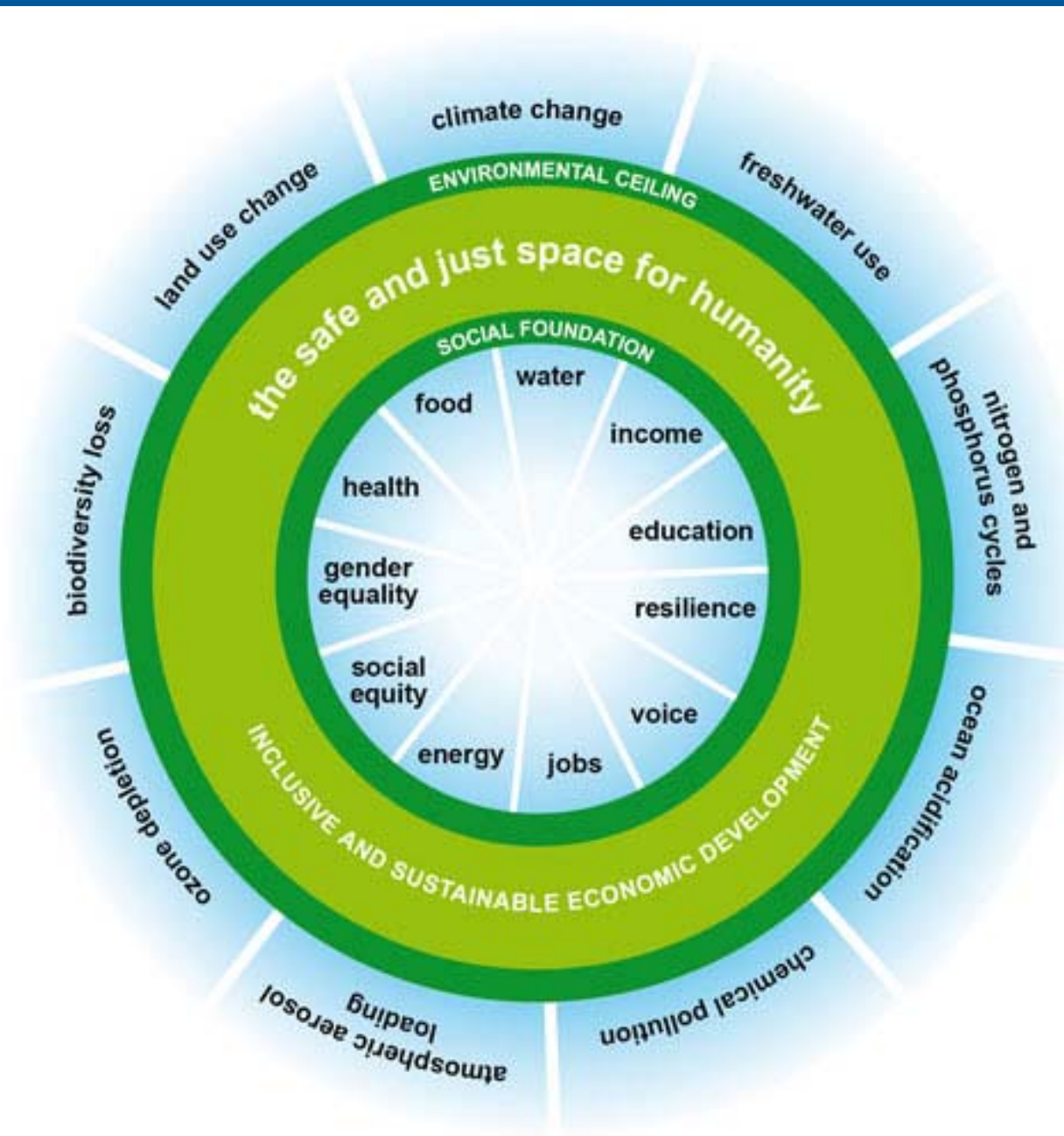
## Against change:

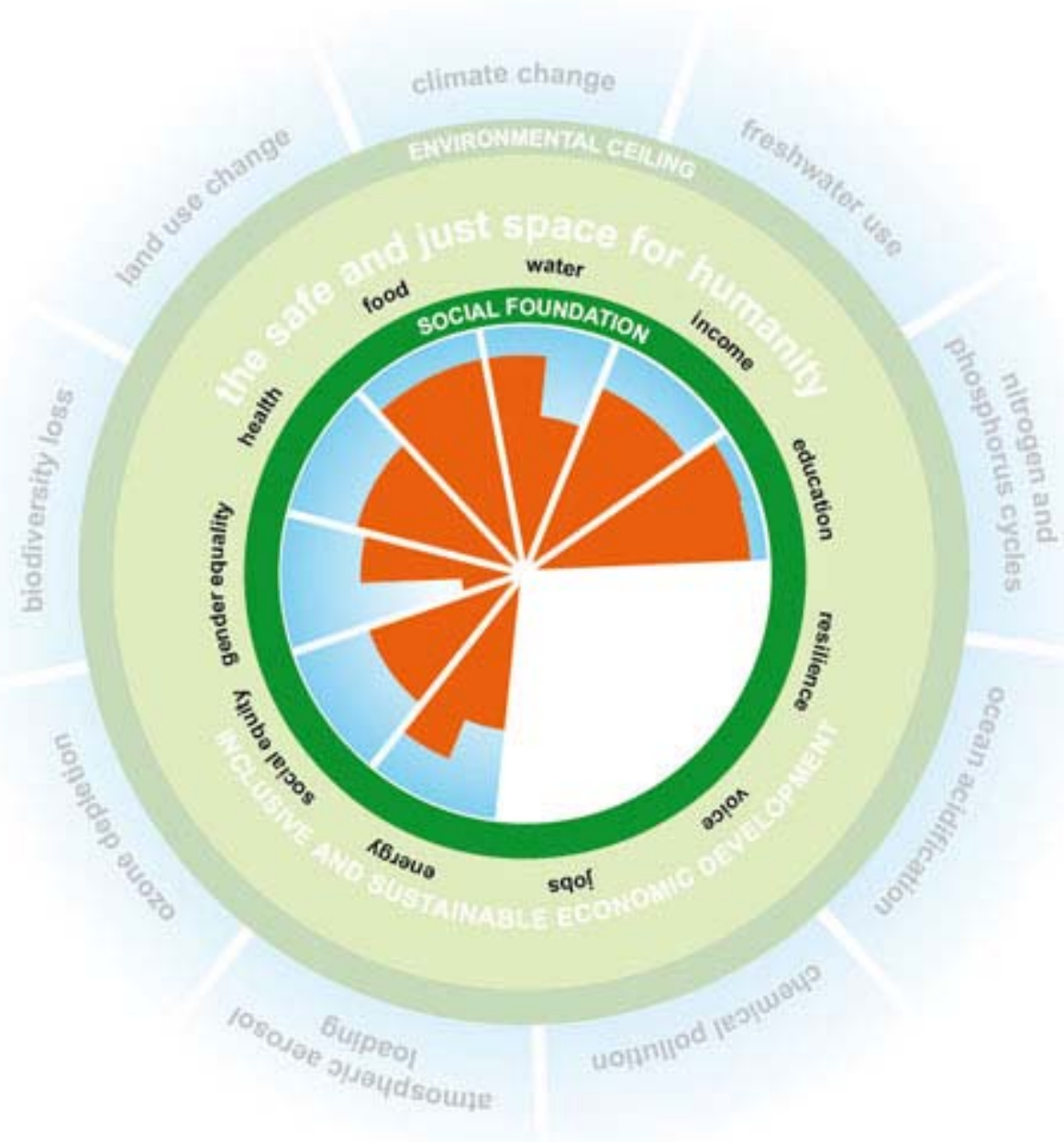
- Limit climate change by reducing CO<sub>2</sub> by 90% before 2050.
- Limit resource deficiencies by reducing material flows by 50% 2050 and 90% until 2100.
- Respect planetary boundaries (e.g. nitrogen and phosphate cycles, fisheries quota, etc.)
- Save biodiversity, change land use planning and intensity, stop invasive species (trade controls), test chemicals' impacts also in low doses

# Planetary boundaries: we go through the ceiling of available Environmental Space



For sustainability, there is also a **social floor** of available Environmental Space





Behind the privileged 15%, there are 60% catching up, **out of poverty into scarcity?**

# Planning for and against change over 50 years

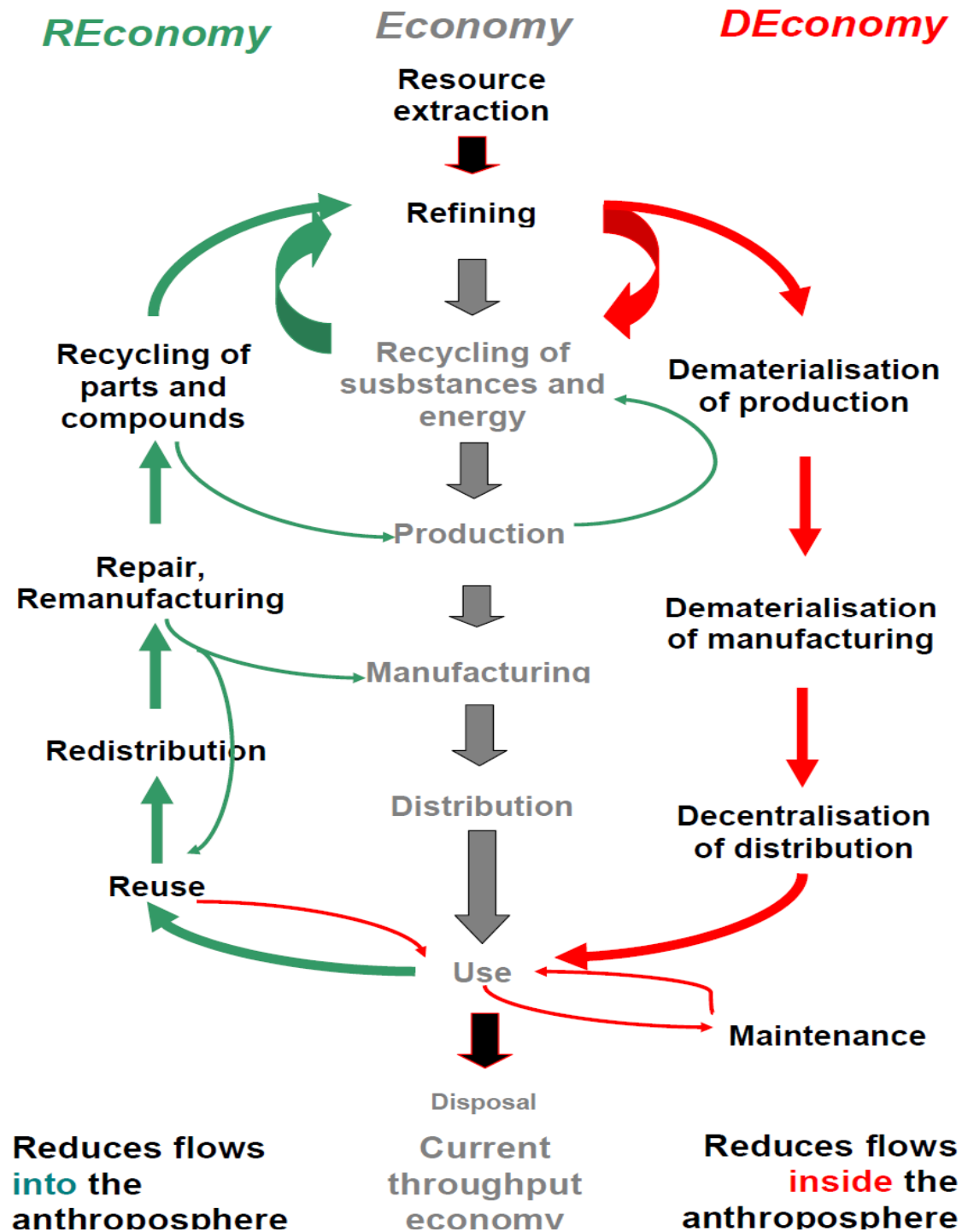
## For change:

- **Accept:** long term irreversible changes are necessary and should result from investment
- Support innovation, creative **destruction** (both!)
- **Foresight** is necessary: use IA and scenarios
  - diverse scenarios, incl. shocks & backcasting
  - investment is sustainable if fitting all scenarios
  - think the unthinkable: Peak Oil, Degrowth, ...
- Promote changing consumption patterns (education, **choice editing**)

# Energy- and Material Consumption of Different Societal Formations

	Hunter & Gatherer	Agrarian Societies	Industrial Societies	Sustainable Societies
Energy [GJ/cap * a]	10-20	~65	223	< 25
Material Consumption [t/cap * a]	~1	~4	22	<2





Recycling is important, but the **REconomy** alone is not enough: **DEconomy** is needed!



# Planning for future demands and preferences

- **Accept: future demands and preferences need to be different from the status quo.**
- **However, they are not known yet → uncertainty:**
  - current optimisation criterion must no longer be maximising utility but enhancing future option diversity, sustaining the **freedom of choice**
- **Involving cultural minorities today may give hints for potential future majority choices.**
- **Structures must be adaptable, reversible and recyclable → High quality waste production.**

# Life cycle planning: DfS criteria

**Accept: The infrastructure must be sustainable in all phases of its life, in a changing environment.**

- Its resource demand for maintenance should approximate zero, e.g. over 50 to 80 years.
- It should not be dependent on scarce resources (metals, minerals, fossil fuels)
- It should support low and hinder high resource consuming life styles, although that may not be popular (airports, motorways, single houses,...).
- It should be low resource consuming in operation to avoid social exclusion with higher prices.

# Sustainable public infrastructure should

- maximise consumer / user satisfaction per service enjoyed,
- combine efficient and effective service provision with emotion, human relations, reasons for pride, enhancing self-esteem and awareness sharpening,
- focus on function and the **experience to be made**, not on objects: solutions should be functional, **appealing – and fun**.
- system functions should provide – wherever feasible – **opportunities to enhance personal standing and social acceptance, encourage involvement, avoid social exclusion**.



# Conclusion

Under (growing) uncertainty, sustainable **public planning implies taking the risks** inherent to directed innovations instead of living with the risks of inaction.

**This can be described as a directed change management, an innovation process including elements of creative destruction, in order to preserve the reproductive capabilities of our societies in their changing environment.**



*We have become far too clever  
to survive without wisdom  
E. F. Schumacher*

*Thank you for  
your attention*

*For the presentation  
and other papers see*

*<http://seri.academia.edu/JoachimHSpangenberg>*