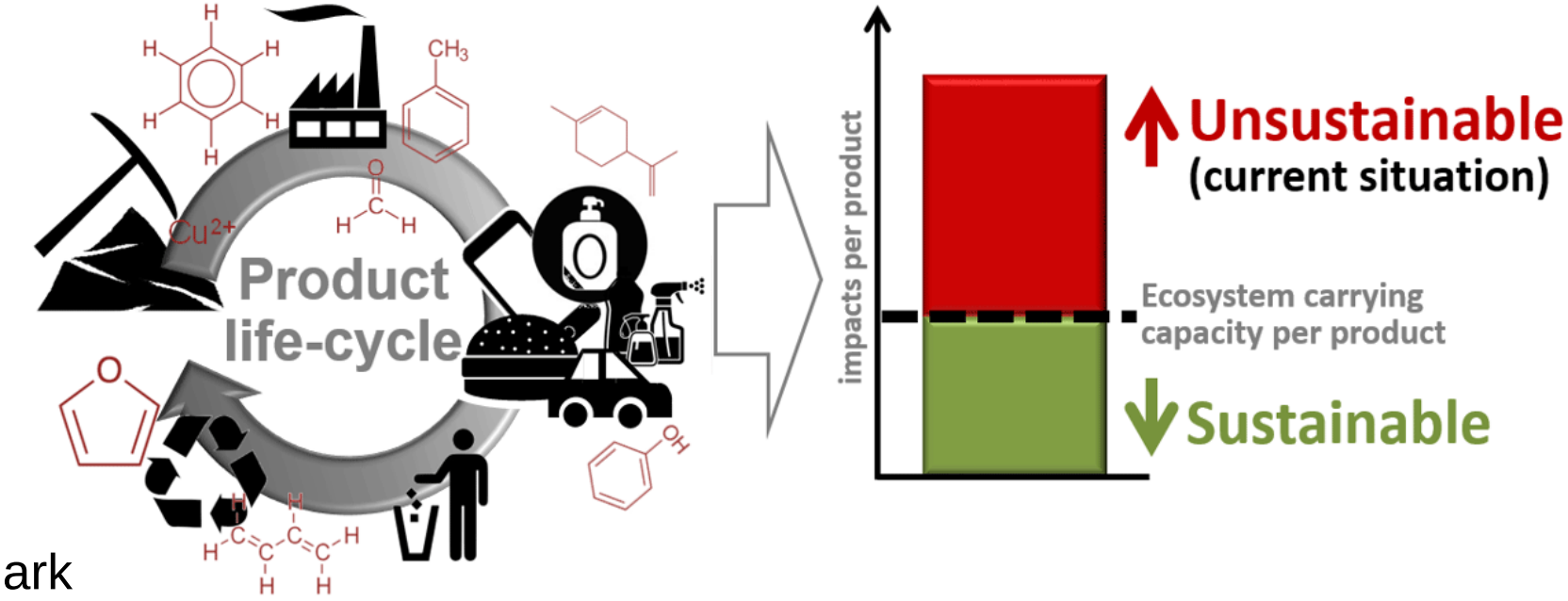
# Moving beyond climate change: Toward environmentally sustainable food systems




Webinar ‘Climate-friendly diets’
World Food Summit | 2-May-2022

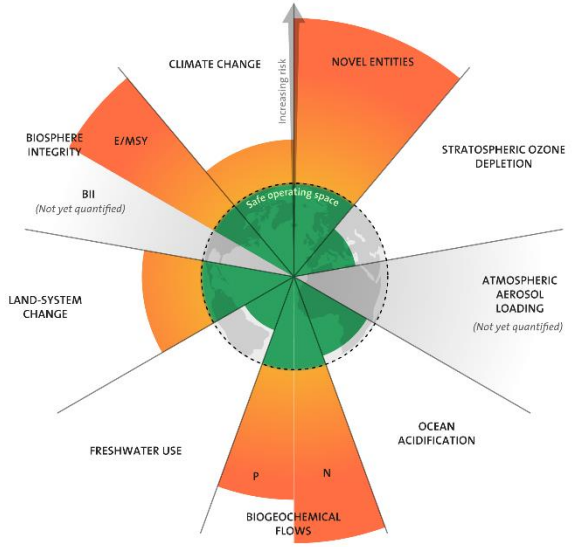
**Prof. Peter Fantke**
Technical University of Denmark

# Food for sustainability: Three overarching questions

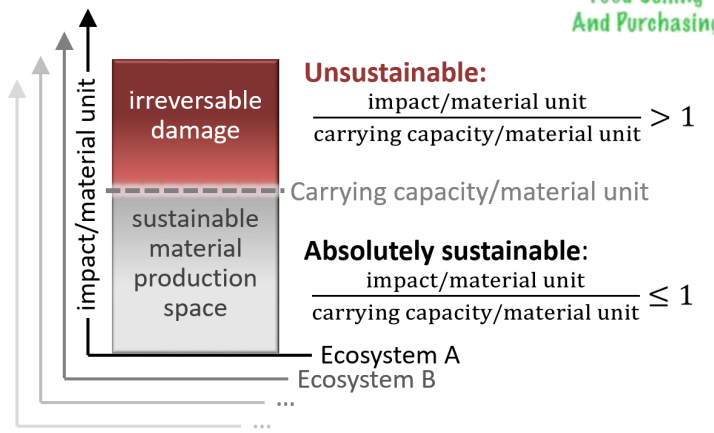
1. Is sustainability more than just climate change?

2. How can we assess environmental sustainability?

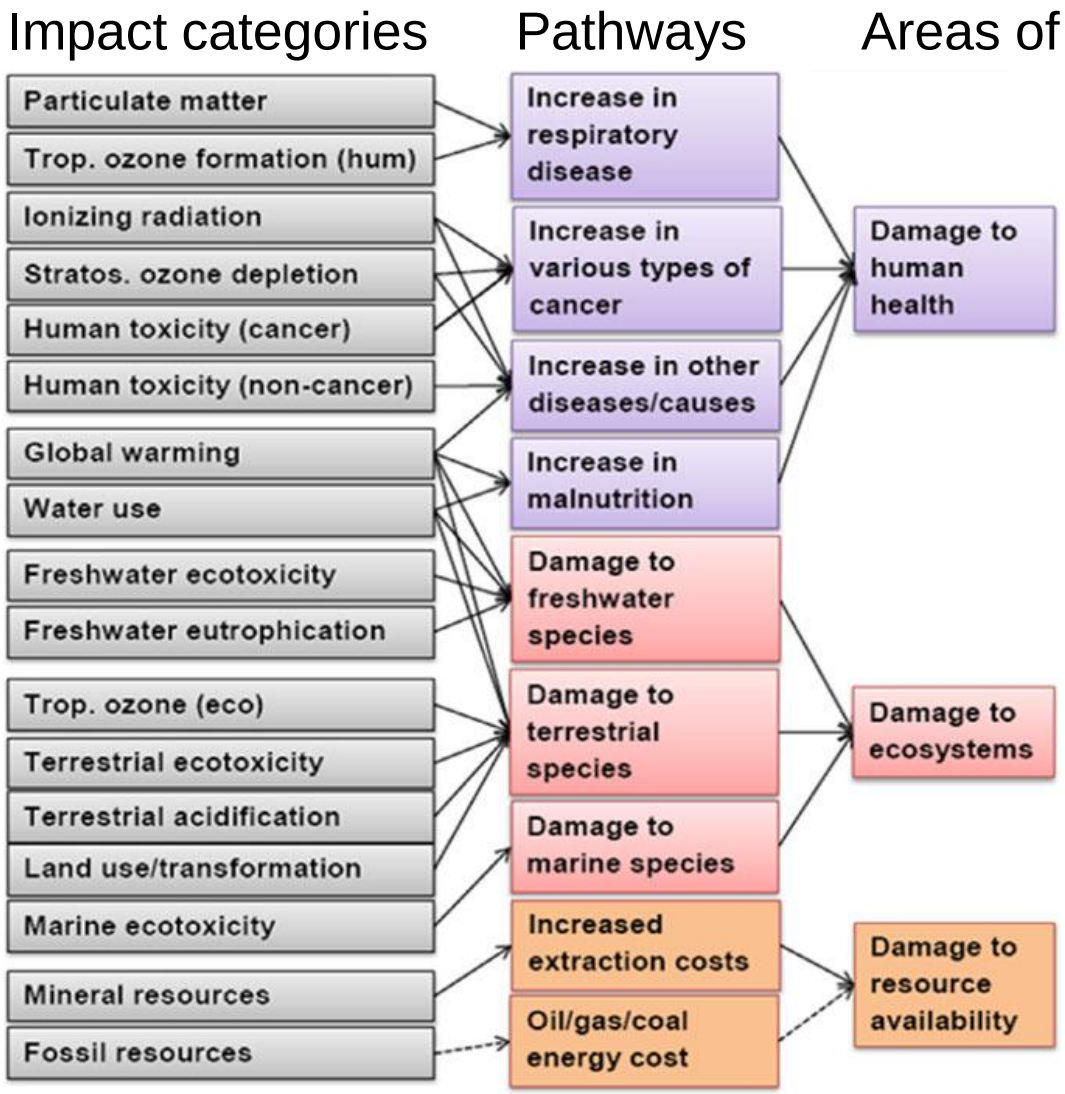
3. What is needed to achieve absolute environmental sustainability?

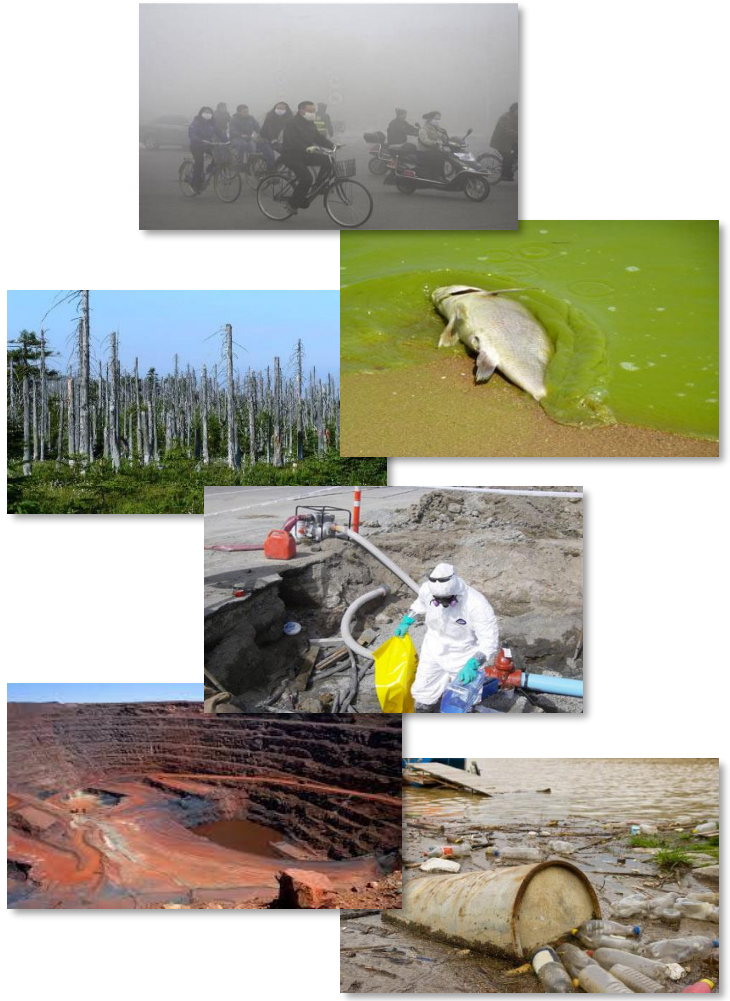






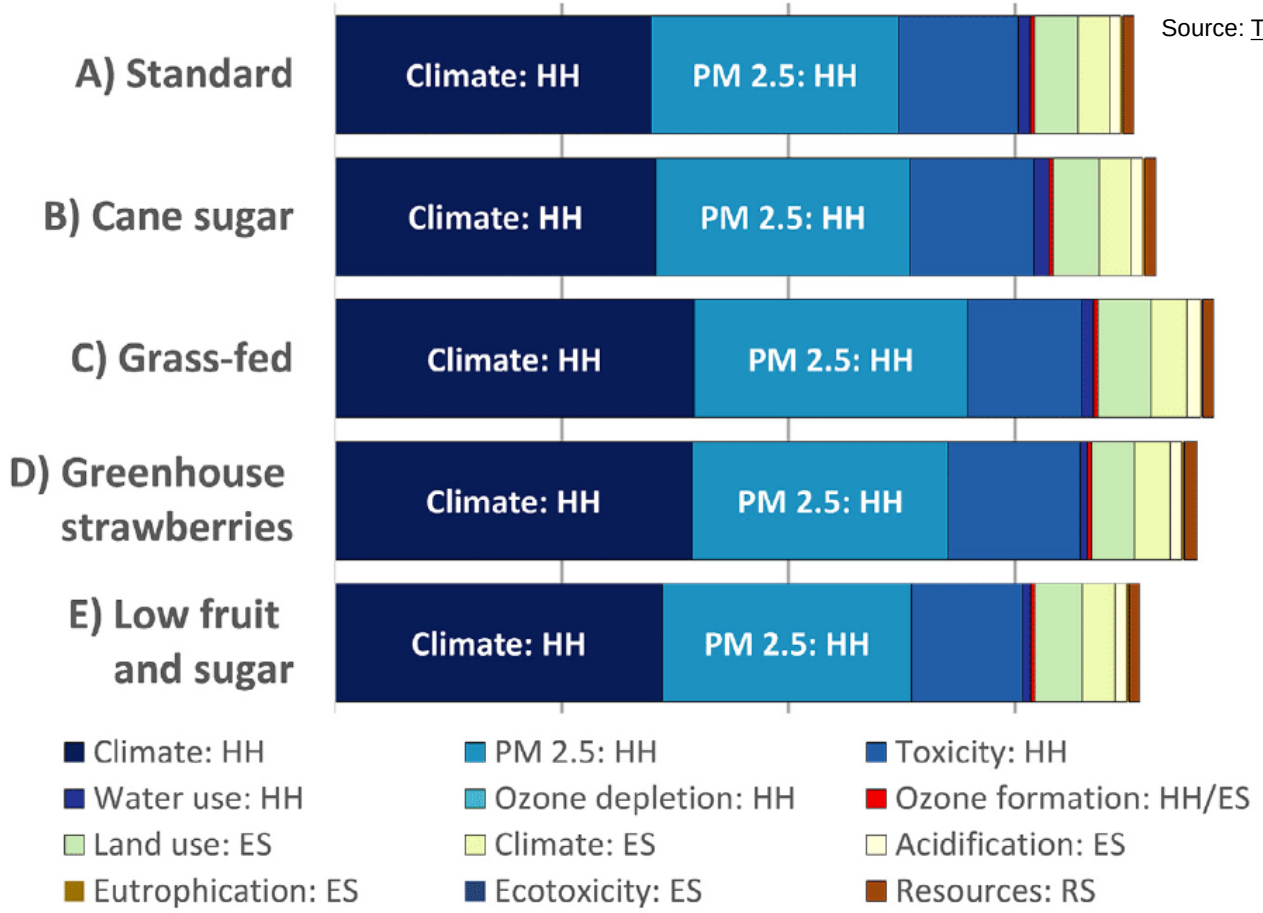
# Beyond climate change: What else should we care about?



# Considering all impact categories avoids burden shifting

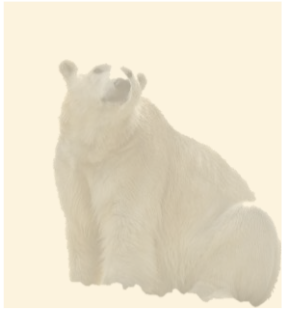
Weighted impact distribution per serving of 1 portion of strawberry yoghurt




Source: Thoma et al. 2022

Impact profiles highly variable across food products, systems and diets!

# Other example focus areas: Harmful chemicals in FCMs

| Persistent | Accumulating | Toxic |
| --- | --- | --- |
|  |  |  |

Example PFASs:
Per- and polyfluoroalkyl substances

→ Pro: multi-performance chemicals
→ Con: ‘forever’ chemicals
→ For human toxicity, consumer exposure usually dominates overall health impacts

# Products and systems: Life cycles matter!

**LCA**

- Life cycle perspective
- Covers broad range of environmental issues
- Quantitative
- Relative comparison or hot-spot analysis

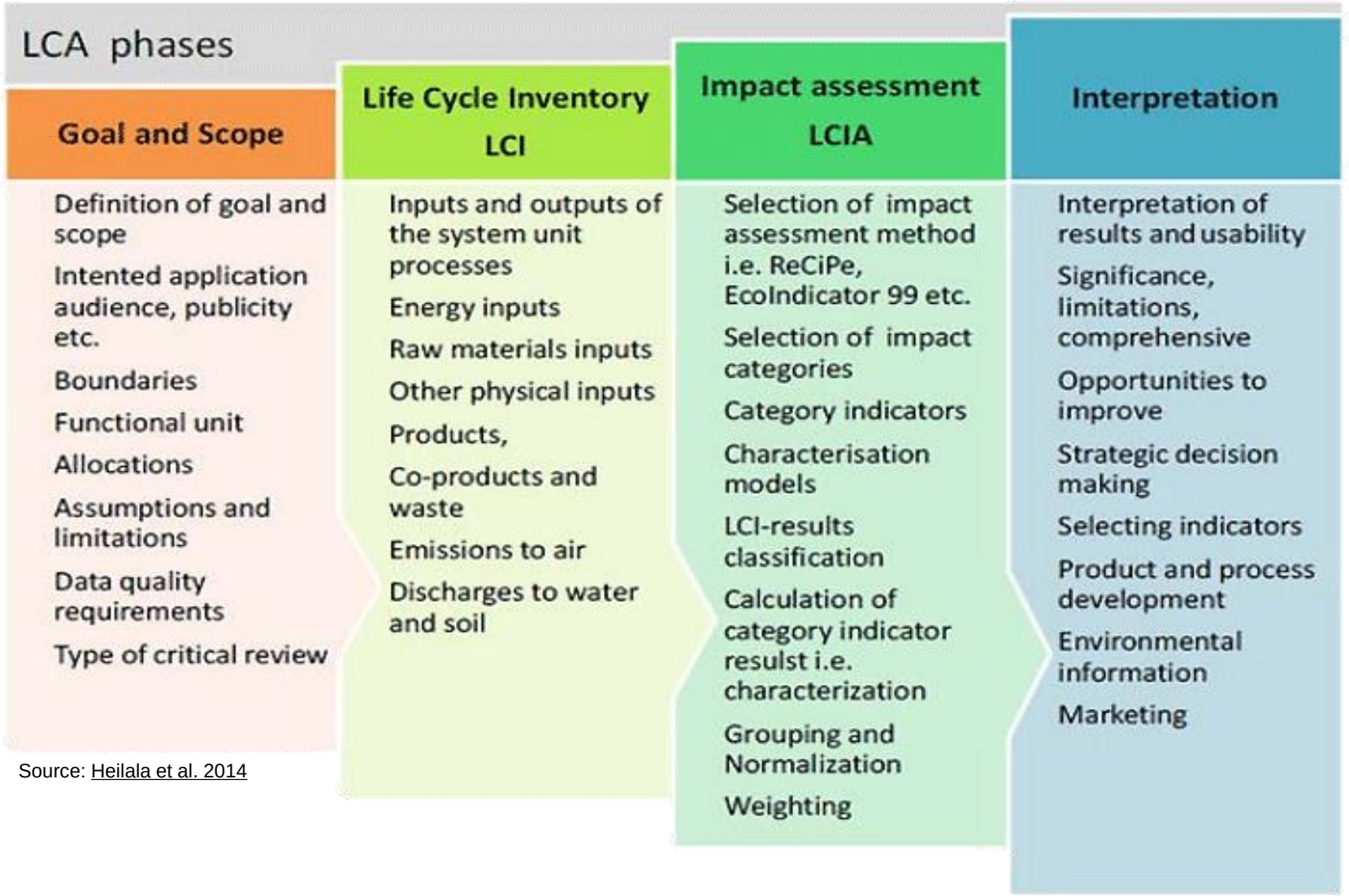
Life cycle of product #2 — more sustainable

Life cycle of product #1 — less sustainable

Environmental impact metrics

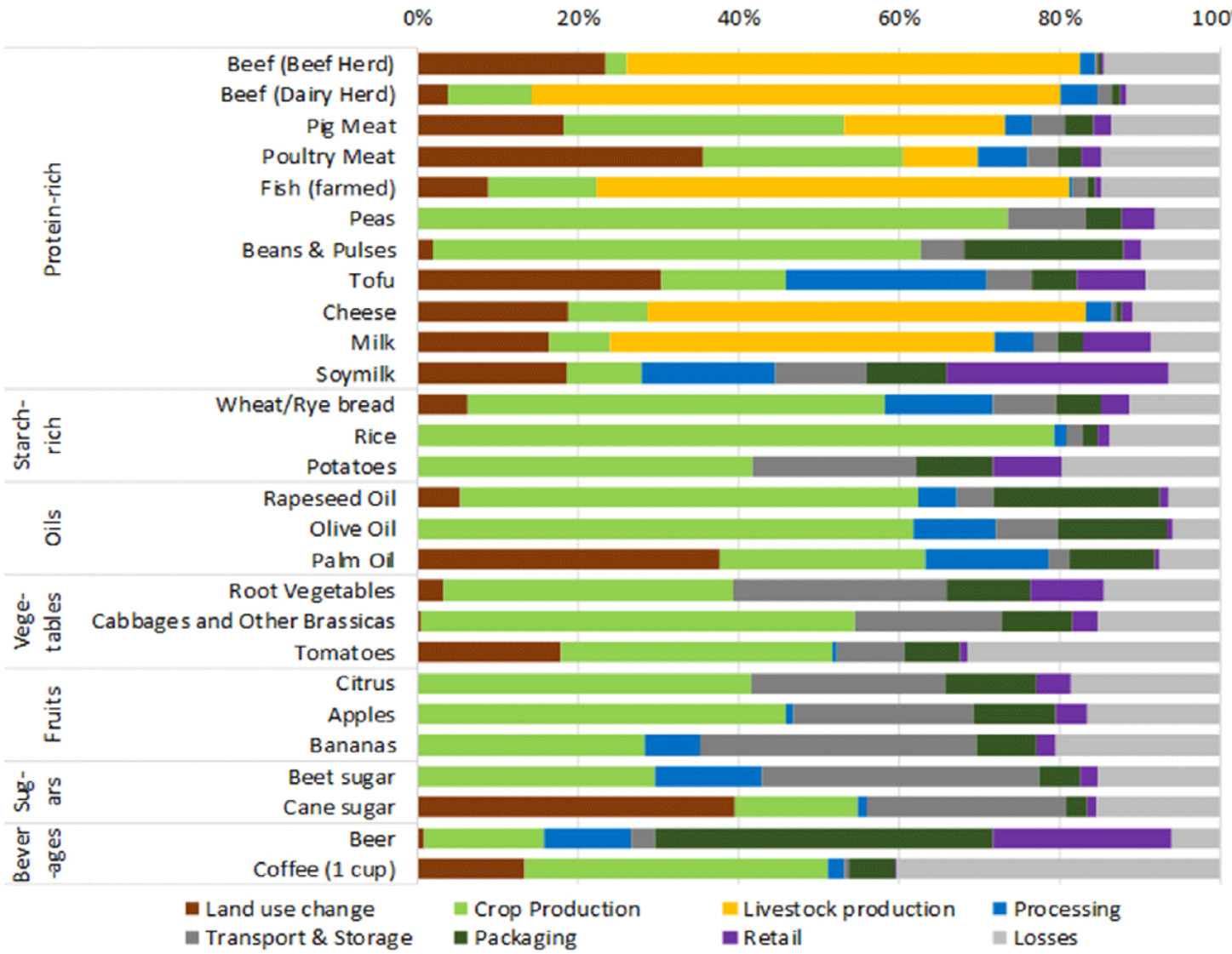
- Climate change
- Ozone depletion
- Toxicity
- Water use
- …

# Four phases of Life Cycle Assessment




Source: Heilala et al. 2014

# Considering all life cycle stages to assess trade-offs

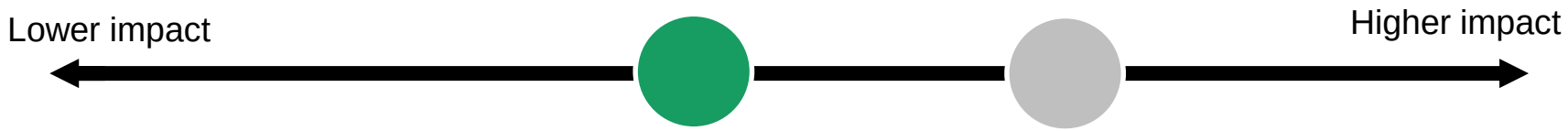



Source: Thoma et al. 2022

Contribution of life cycle stages to climate change and other impacts varies among food groups!

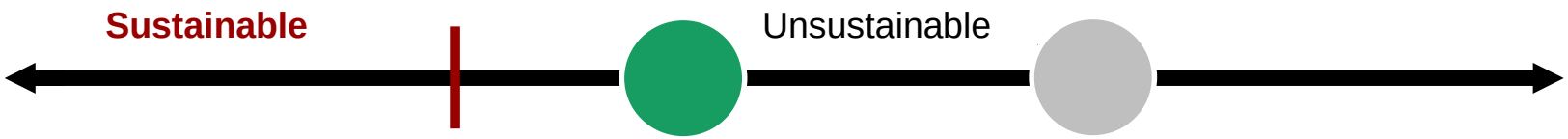
# How much is enough? Our way to absolute sustainability

LCA supports relative assessments of environmental sustainability (*"more sustainable"*)




**Absolute sustainability** (*"sustain-able"*)

- Where is the boundary beyond which the activity becomes unsustainable?
- What is sustainable in absolute terms?



# ‘Sustainable’?


Greenwashing

calls for

**absolute metrics**

in the sustainability assessment

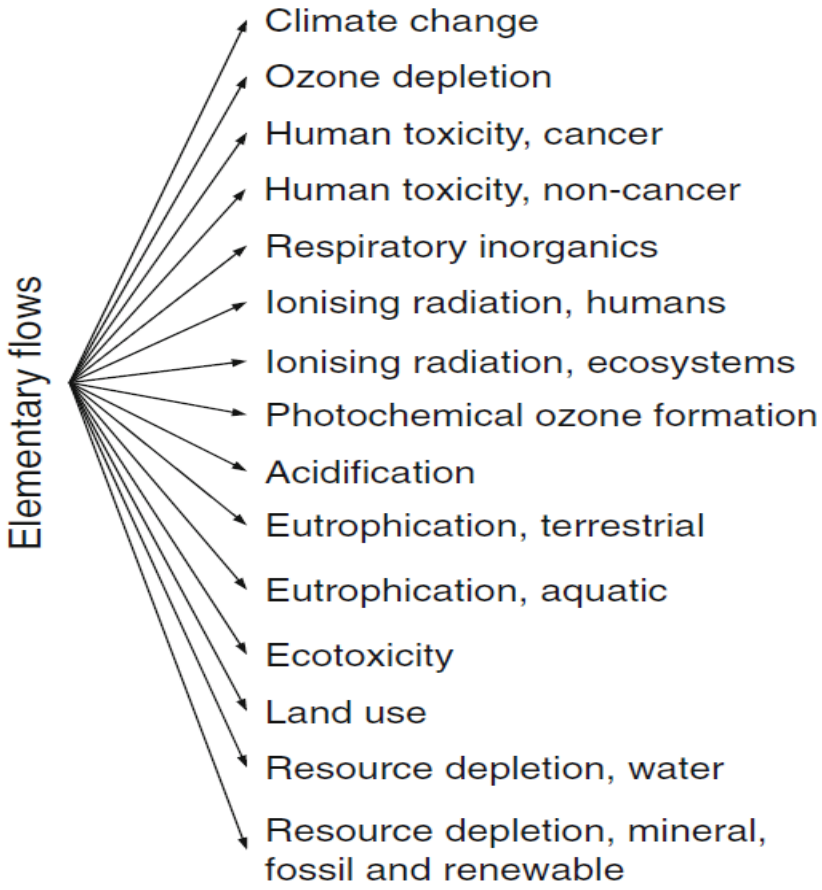
of products and systems

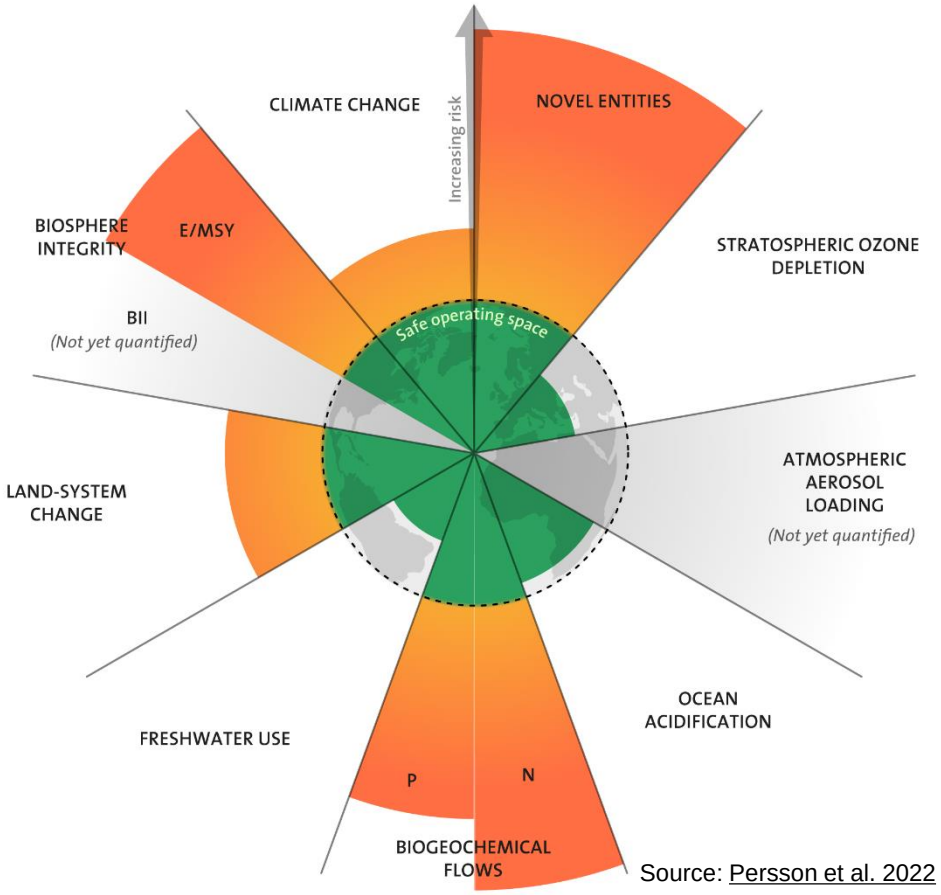
# Linking impact categories to boundaries

Inventory

Impact categories

Planetary boundaries

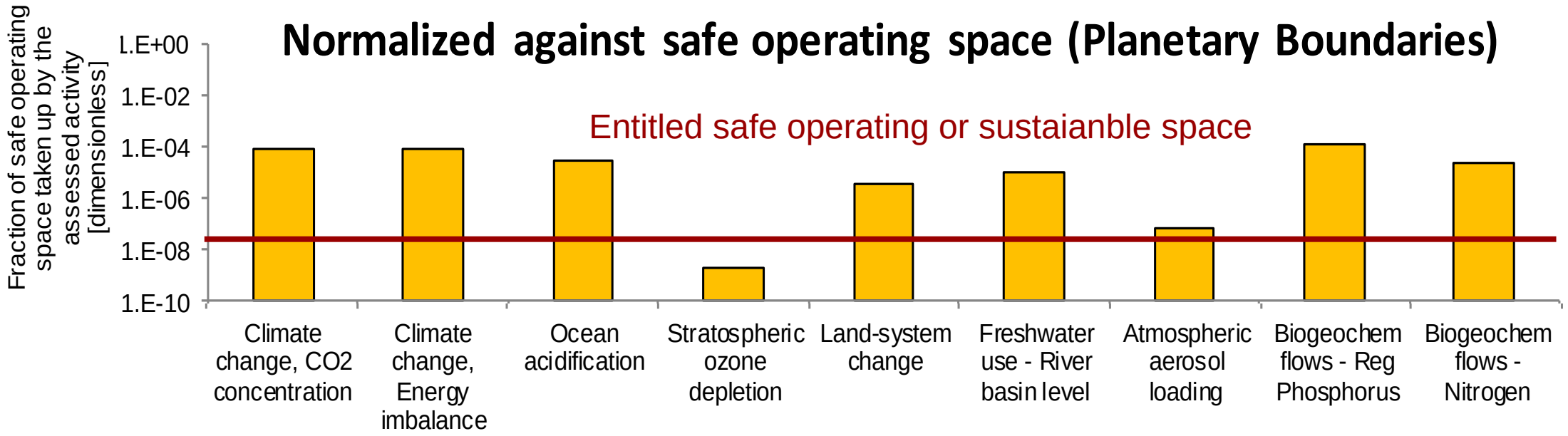



Source: Persson et al. 2022

# Environmental constraints

- Annual supply of potatoes for Danish consumption
- Relate an activity's impact to planetary 'safe operating space'
- Safe operating space must be scaled down to contributors




**How to cut the sustainability space? → Entitlement**

# Take-Home Messages

→ Consider **all environmental impacts** to avoid burden shifting from e.g. climate change to chemical & plastics pollution

→ Include entire **life cycles** of food products & technologies to identify hot-spots and trade-offs

→ Compare impacts against biophysical targets to achieve **absolute environmental sustainability**

→ Increase resilience of food systems through **crop diversification** to reduce needs for e.g. pest control

→ Better **adapt** to local crop production conditions to reduce resources

→ Reduce **packaging** and increase recycling rates to reduce waste