



Aalto University
School of Arts, Design
and Architecture

Sustainable design S1

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22.4.2024

Agenda

13.15-13.45 Course schedule and teacher introductions.

13.45-14.30 'Where do you think change comes from' exercise

14.40-15.15 Sustainability approaches and priorities

- *Topical issues and fads?*
- *Planetary boundaries, 'Radar'*
- *Safe and just space for humanity, 'Donough'*
- *Circular economy, 'Butterfly'*
- *Sustainable consumption and 1,5 degree lifestyles & eco-efficiency. 'Footprint and Handprint'*

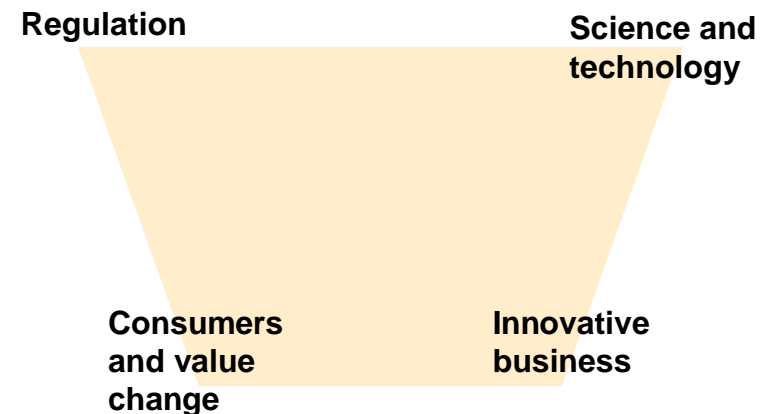
15.15-15.45 Design 'on demand' / ' at root causes' / 'for priority materials'

Where do you think change comes from? Driving forces of sustainability?

- Consumers and value change
- Innovative business
- Science and technology
- Regulation

Pick a corner and go talk with others about your choice.

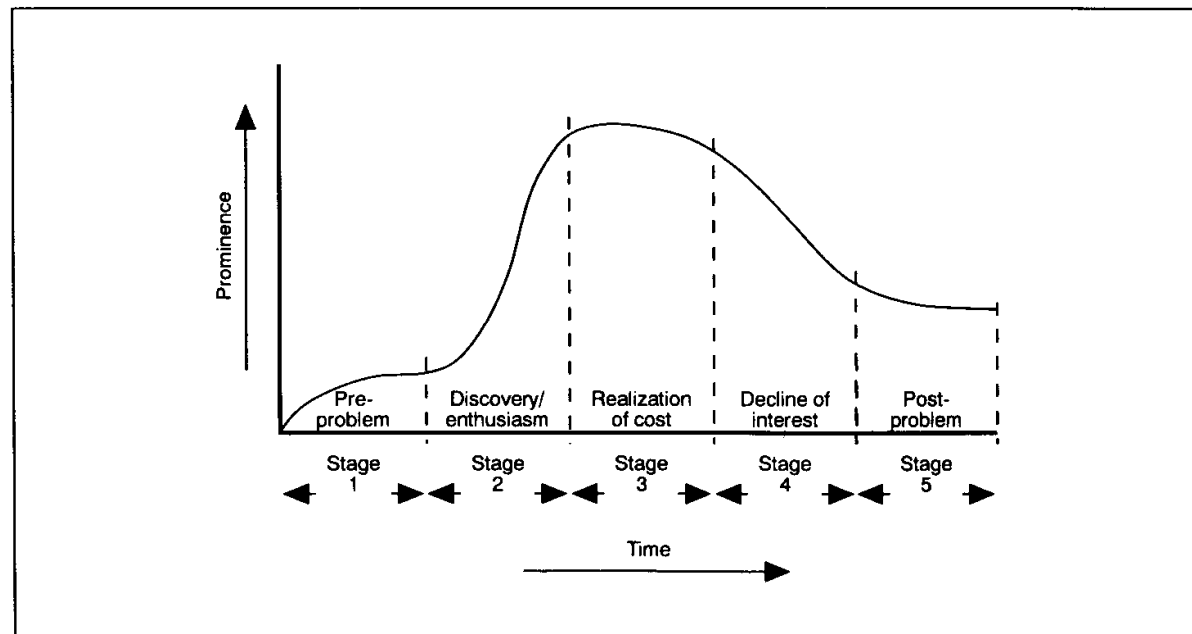
Be ready introduce your perspective.



What issues to address: what is topical, when to get engaged

Caught in
the 'topical'

'News' as
entertainment



Downs, A. (1996): The "Issue-Attention Cycle". *The politics of american economic policy making*, 48.

Emergence of micro-plastics discourse

The scientific
'discovery' took
place in 2005.

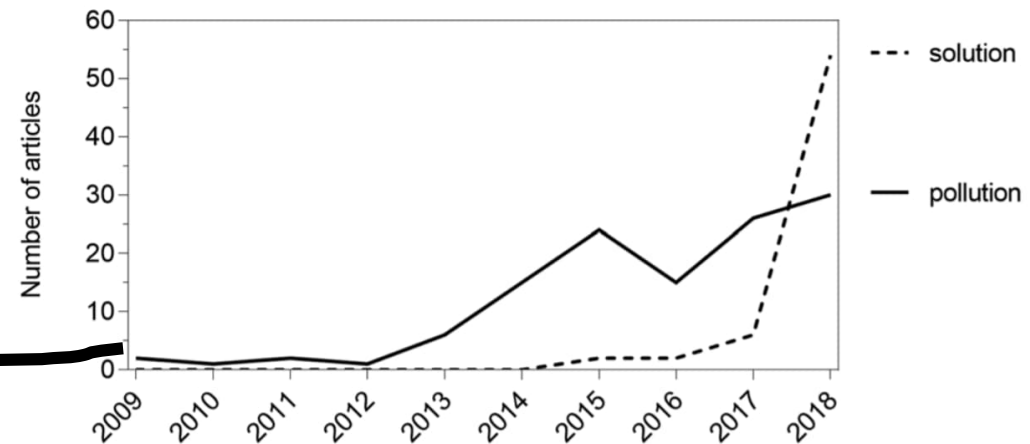


Figure 2. Number of published media articles on (micro)plastics per year addressing two main topics, $n = 186$.

The Guardian (UK), The New York Times (USA), and HuffPost (UK + USA) as quality newspapers and The Sun (UK) and USA Today as tabloids

Völker, C., Kramm, J., & Wagner, M. (2019). On the Creation of Risk: Framing of Microplastics Risks in Science and Media. *Global Challenges*, 1900010.

Materiality process

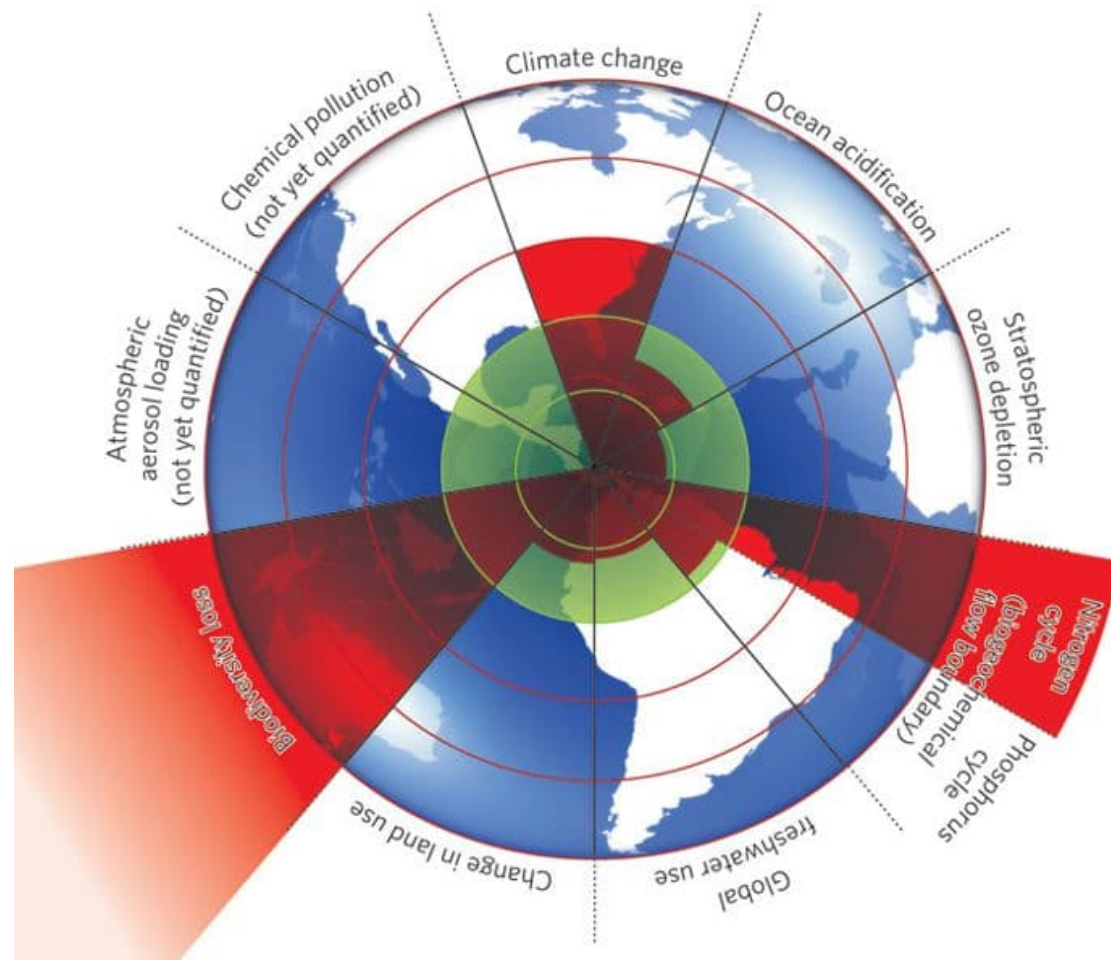
Through our sustainability reporting, we aim to give stakeholders a clear picture of our performance, the challenges we face, and actions to address those challenges. We define our key stakeholders as customers, consumers, employees, shareholders, sugar beet and cane sugar growers, other key suppliers, neighbours, the authorities and the local community. Our intention is to report on information defined as material by the materiality matrix.

Stakeholder consultation



Detailed calculation method see page 56.

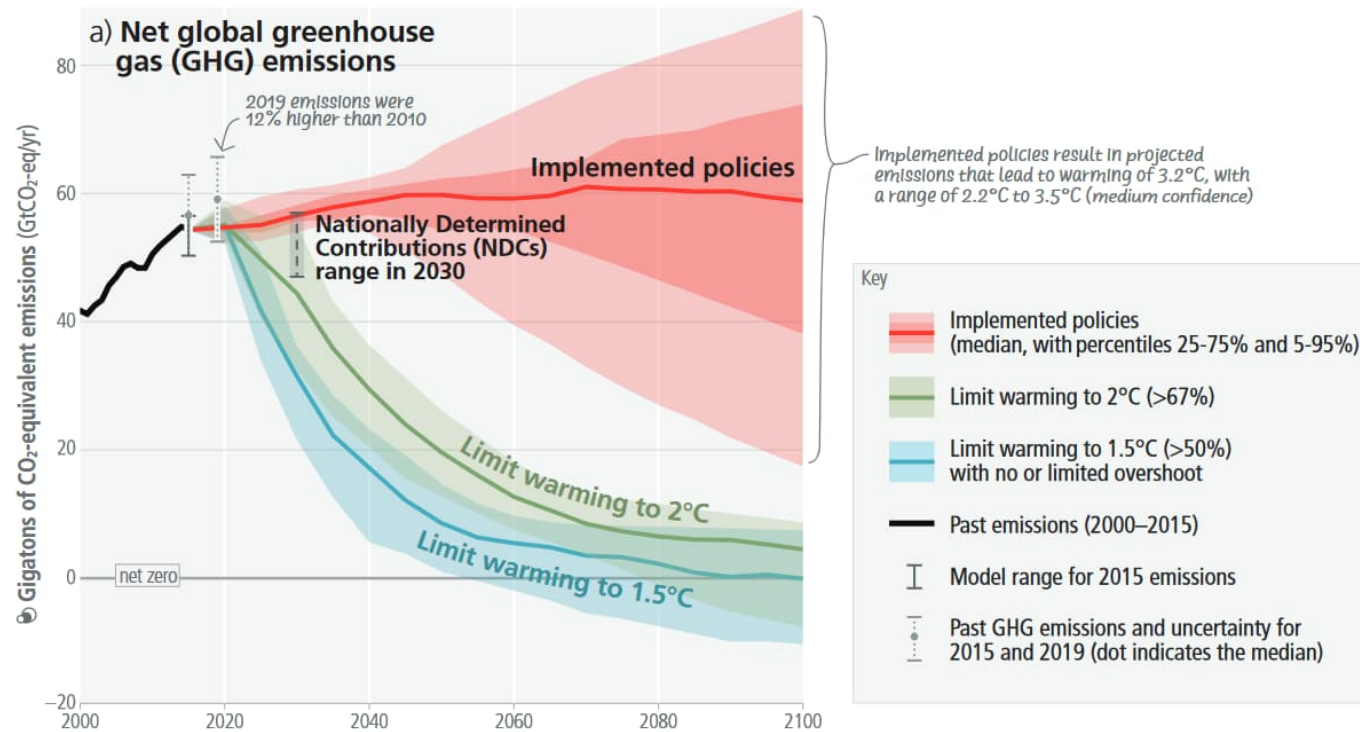
What issues are you dealing with: Planetary boundaries



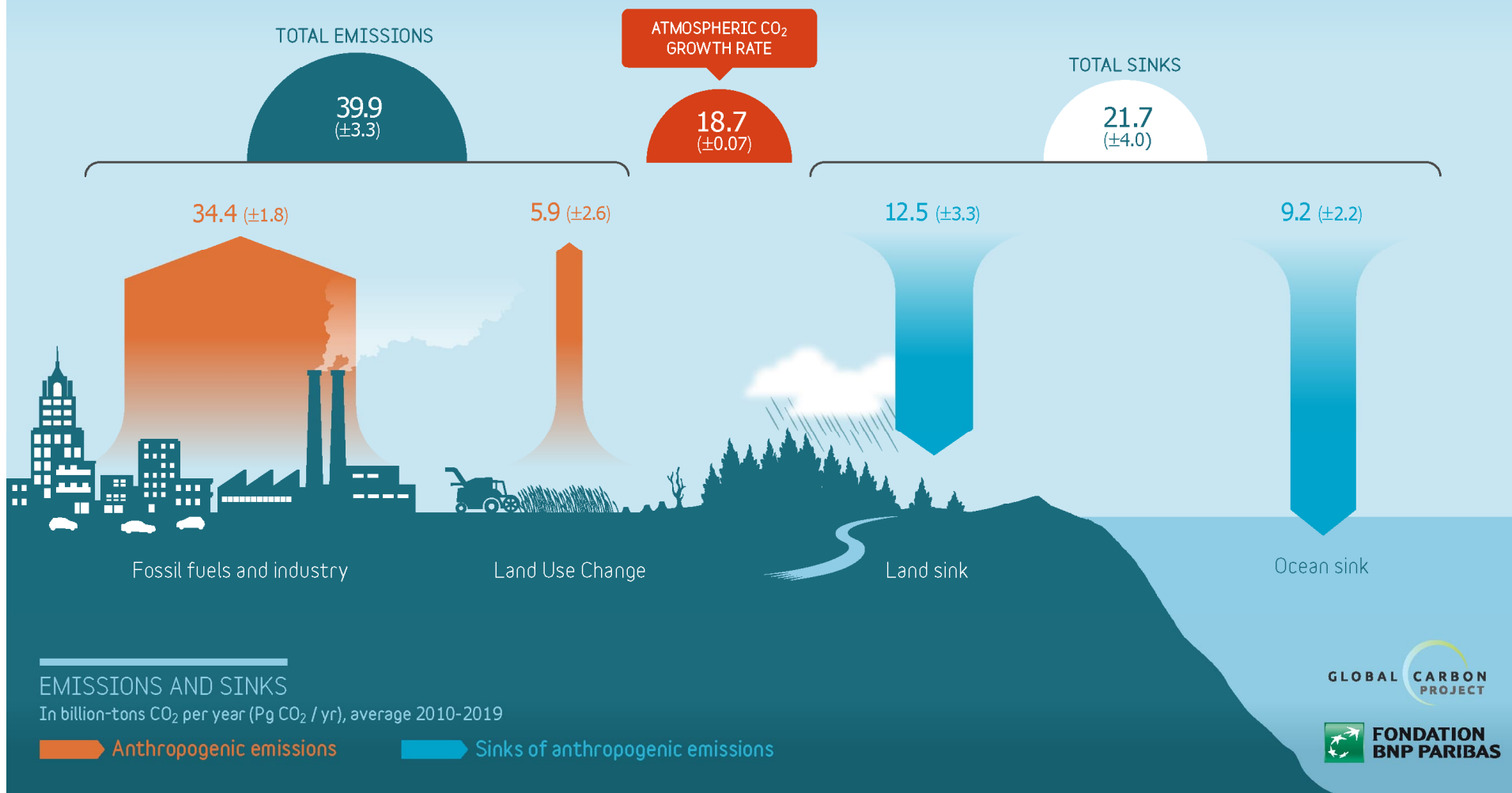
Short description of the logic and dimensions:
<https://www.youtube.com/watch?v=8dCU6jd-S9Y>
A view on how the economic and political systems are connected to the PP's
<https://www.youtube.com/watch?v=qLV4widac8A>

Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

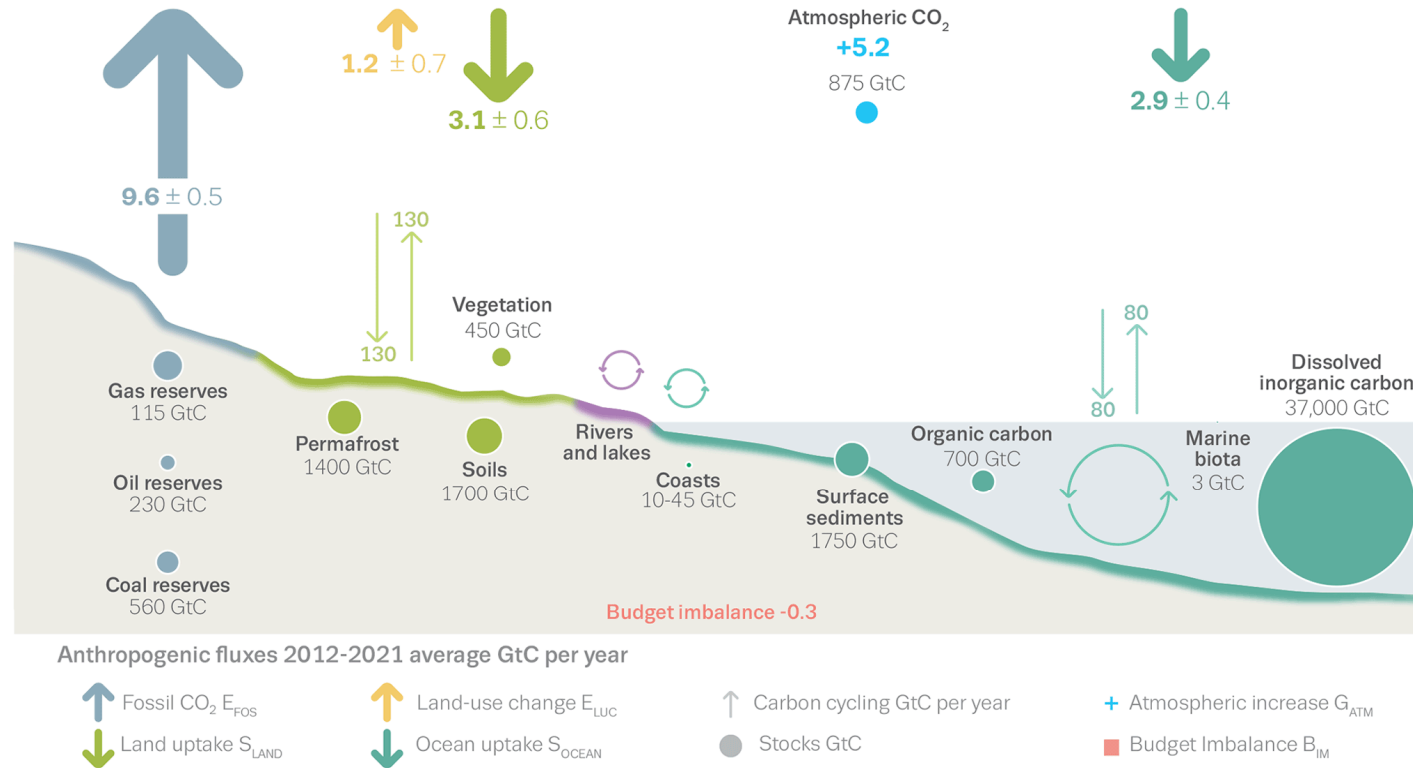
Net zero CO₂ and net zero GHG emissions can be achieved through strong reductions across all sectors



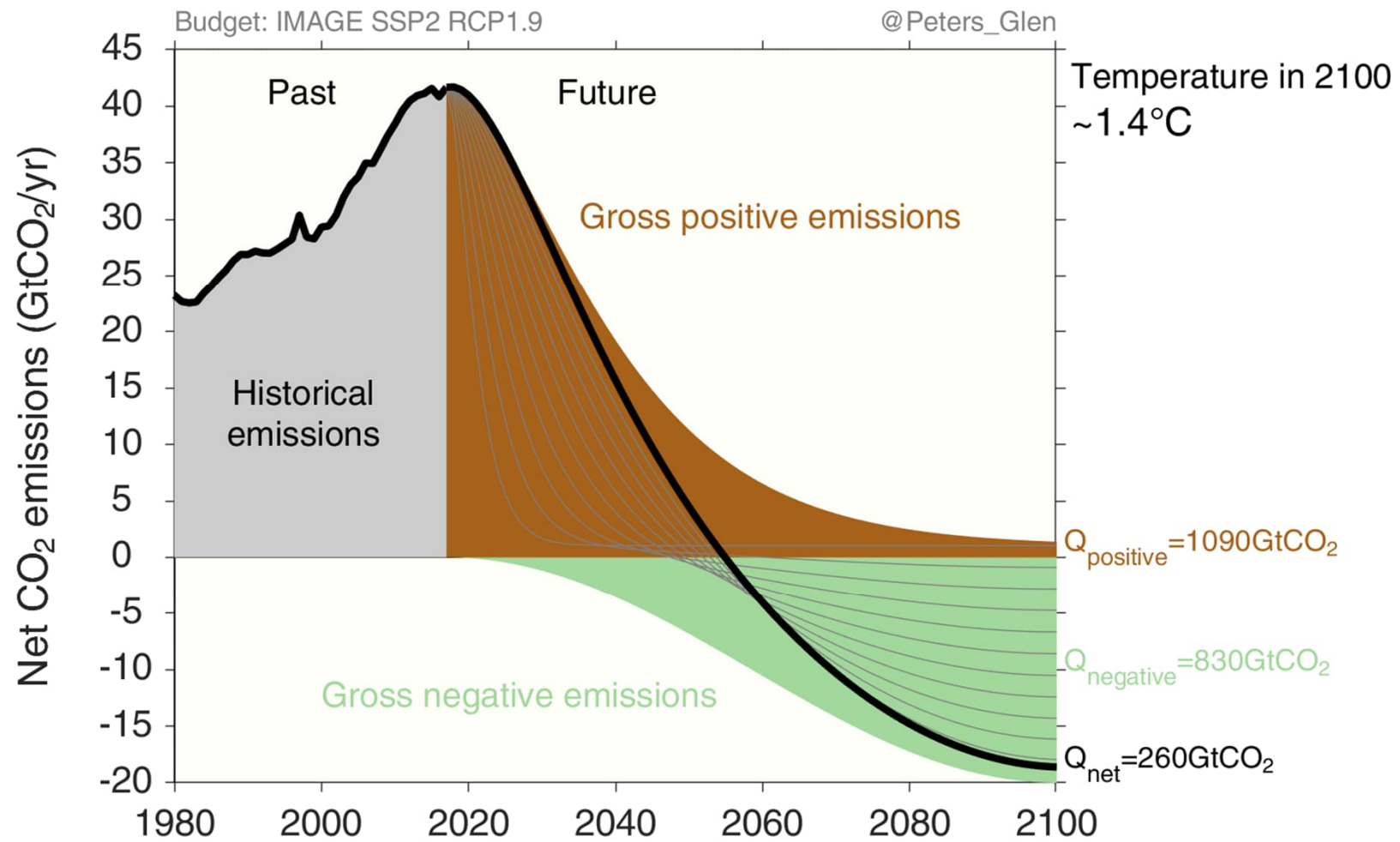
GLOBAL CARBON BUDGET 2010-2019



The global carbon cycle



Source; Friedlingstein, Pierre, et al. "Global carbon budget 2022." *Earth System Science Data Discussions* 2022 (2022): 1-159.



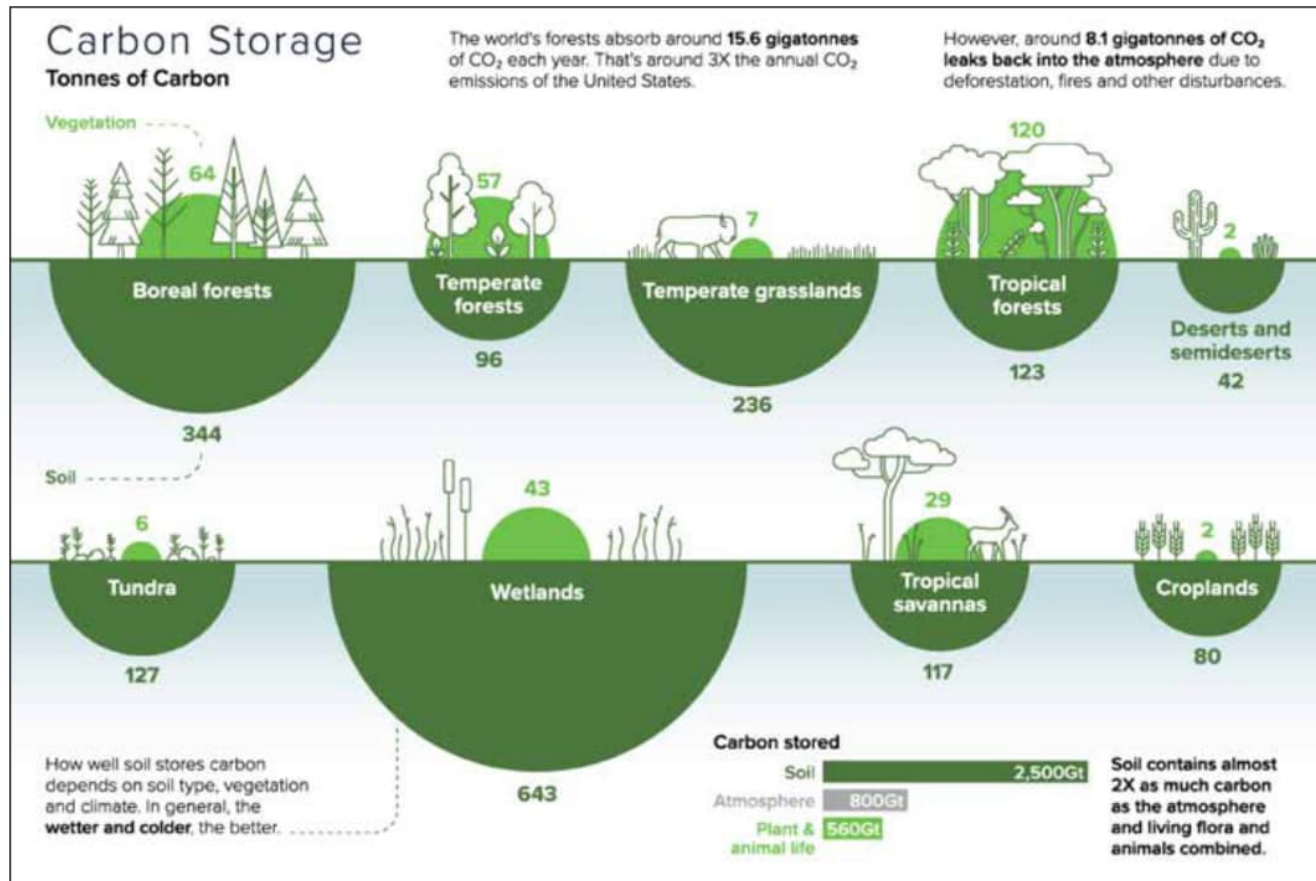
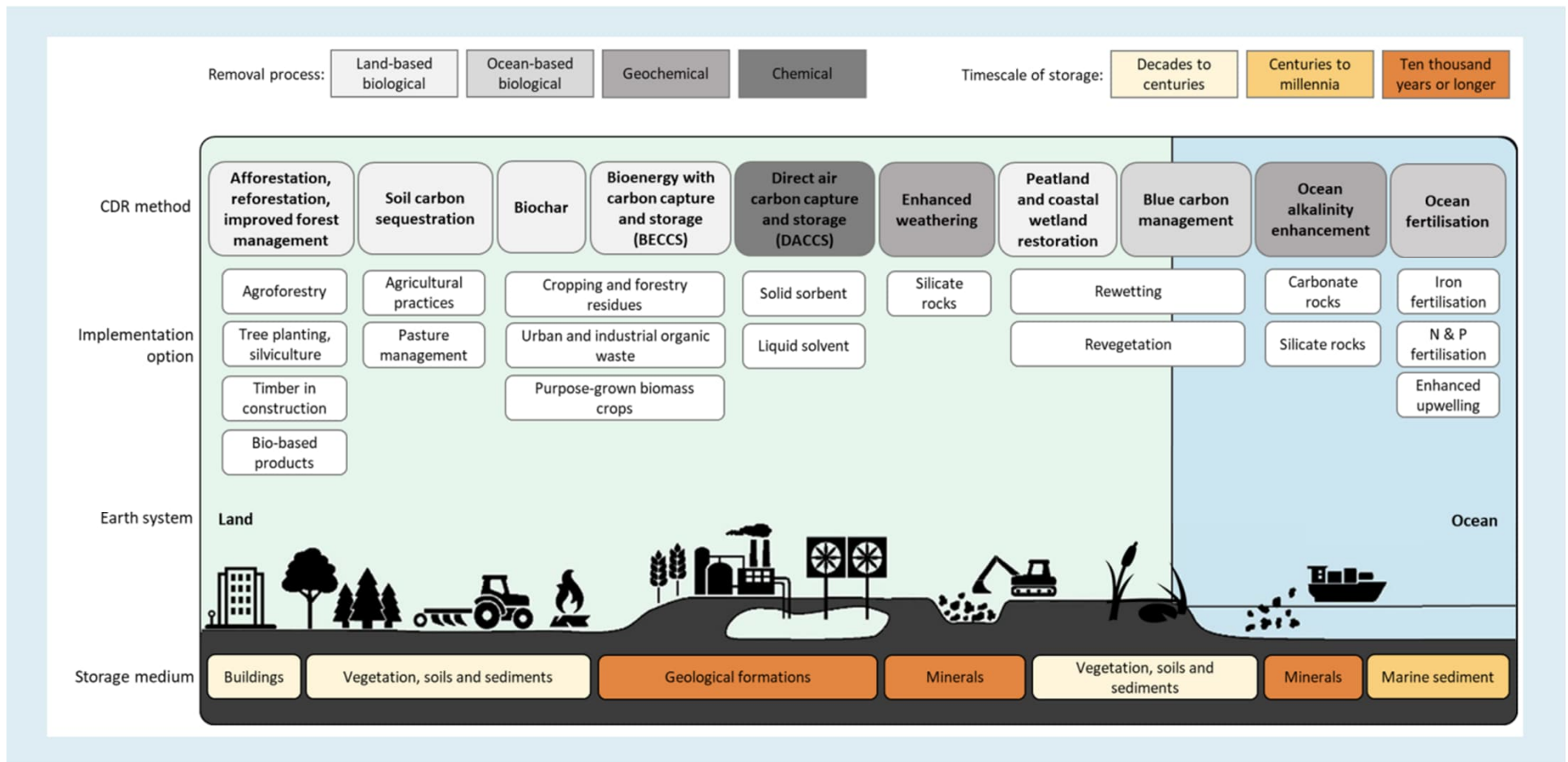


Figure 2. Carbon storage in and above soils, Gt. (Source: IPCC, NASA).

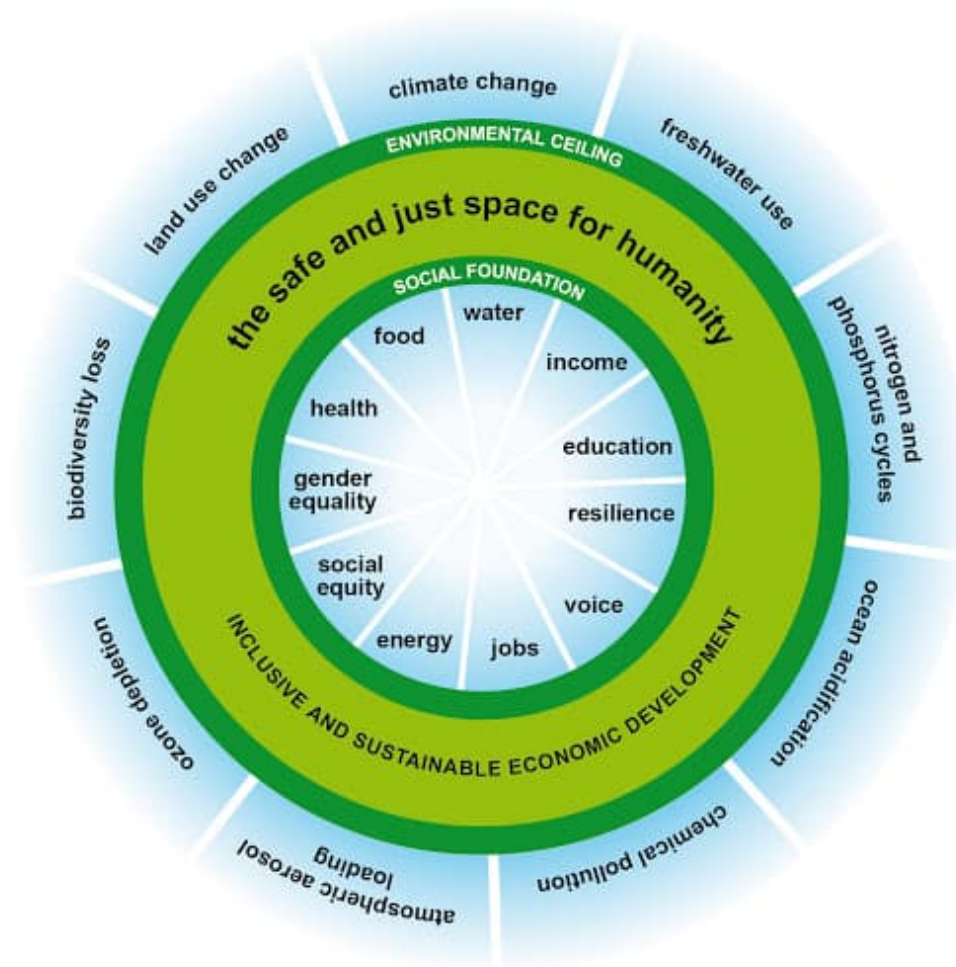
<https://clc.fi/wp-content/uploads/2023/06/CLC-Position-Paper-Holistic-land-use-plan20.pdf>



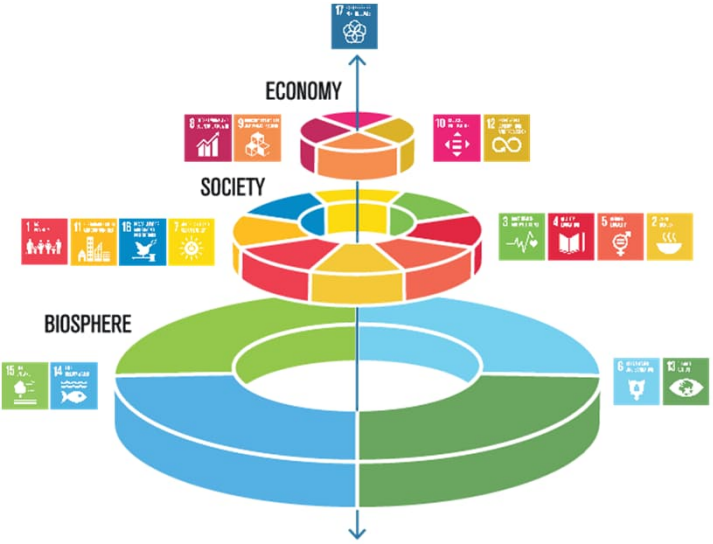
Options for carbon removal IPCC AR6 WG3, p. 1262

Safe and just space for humanity

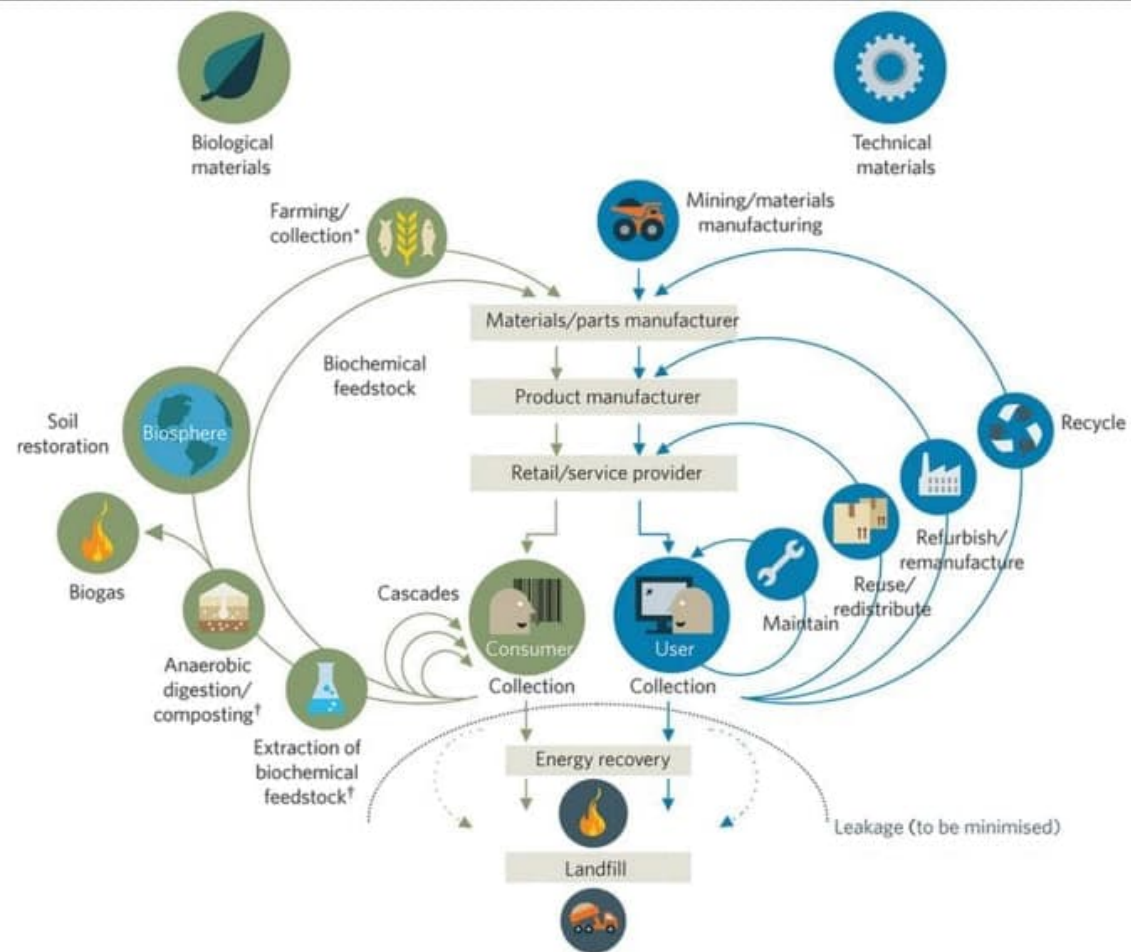
Raworth 2012



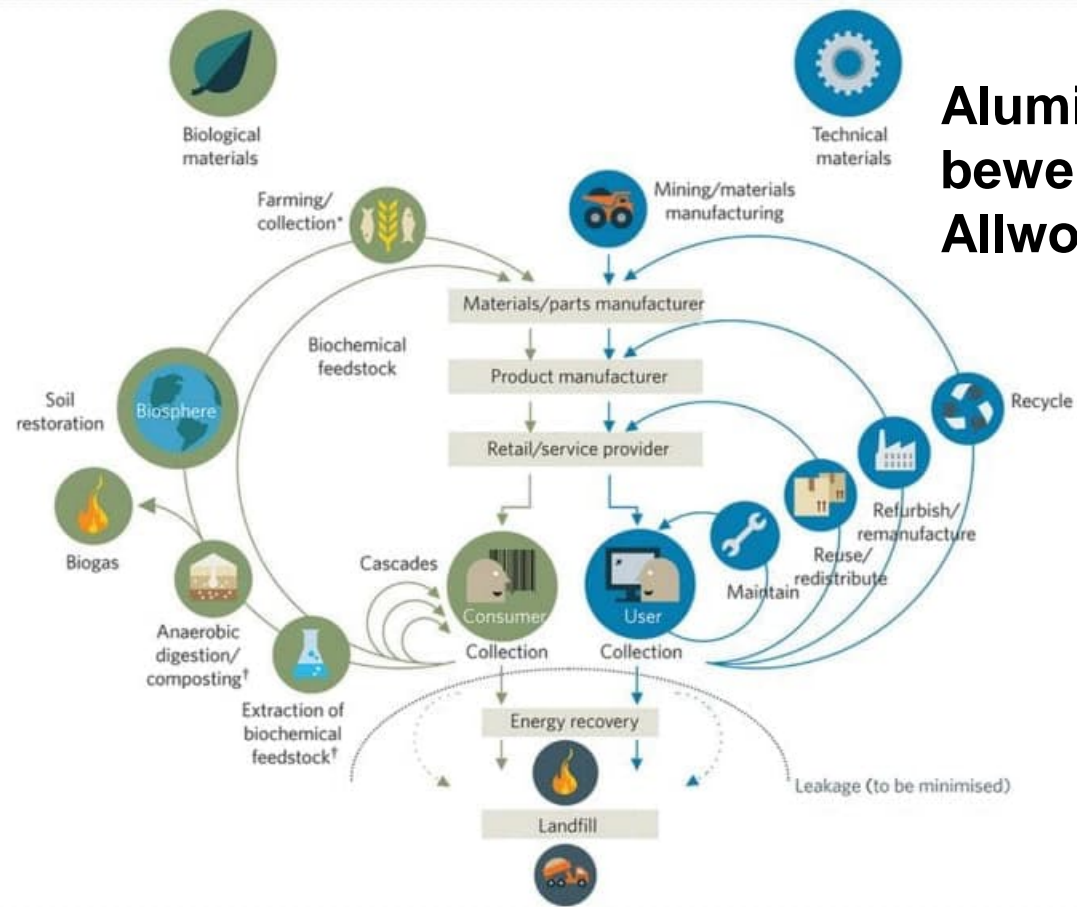
SUSTAINABLE DEVELOPMENT GOALS



Circular economy



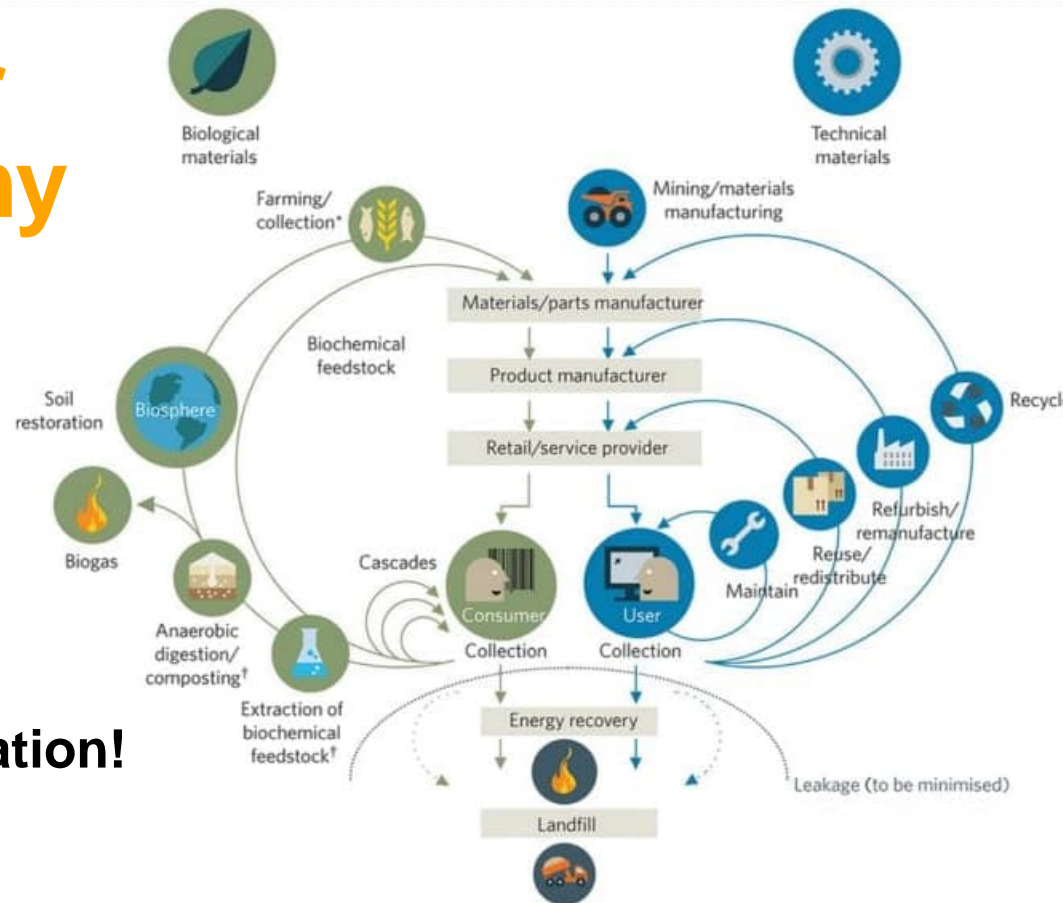
Circular economy



Aluminium beverage can in Allwood et al ?

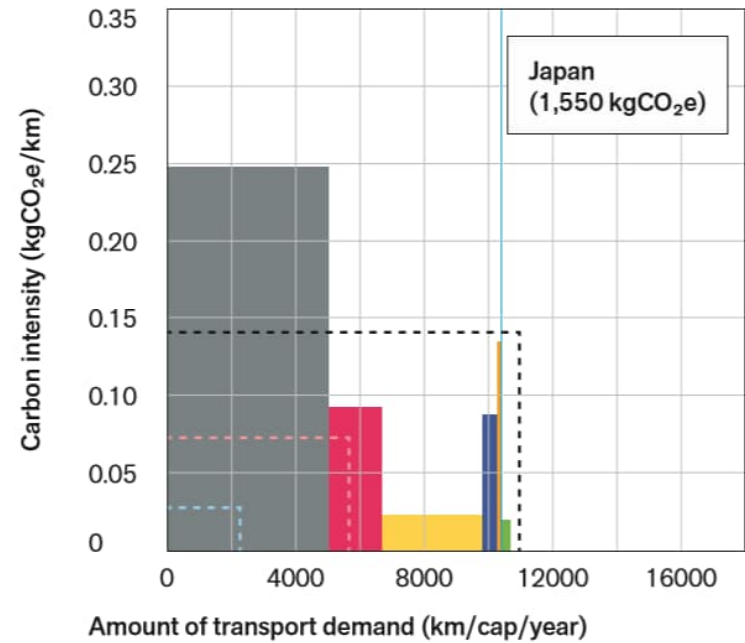
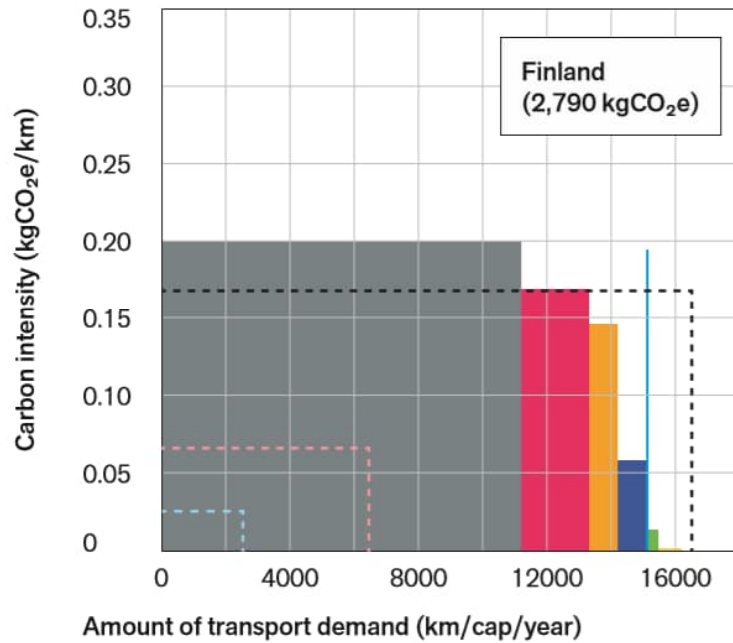
Circular economy

Biodiversity!
Land use!
Bio-accumulation!
Soil health!



**Availability/
Cost
Loss/
Quality/
of the material
stock!**

Figure 3.8. A comparison of carbon footprints and their breakdown (mobility, in kgCO₂e/cap/year 2017)

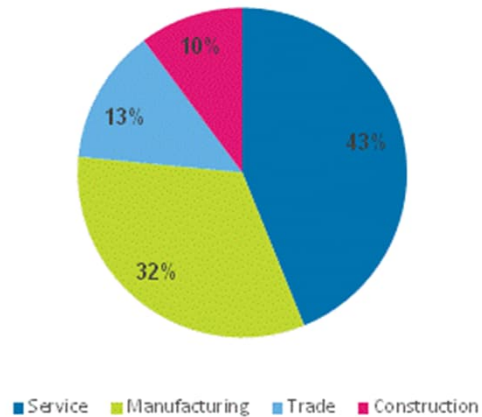


● Car ● Airplane ● Other private ● Bus
● Ferry ● Bicycle ● Train ● Walking

● Car ● Airplane ● Train ● Bus ● Motorcycle
● Ferry ● Bicycle ● Walking

I=PAT

$$\text{Impact} = \text{Population} \times \text{Affluence [€]} \times \text{Technology [impact/€]}$$



Footprint & Handprint

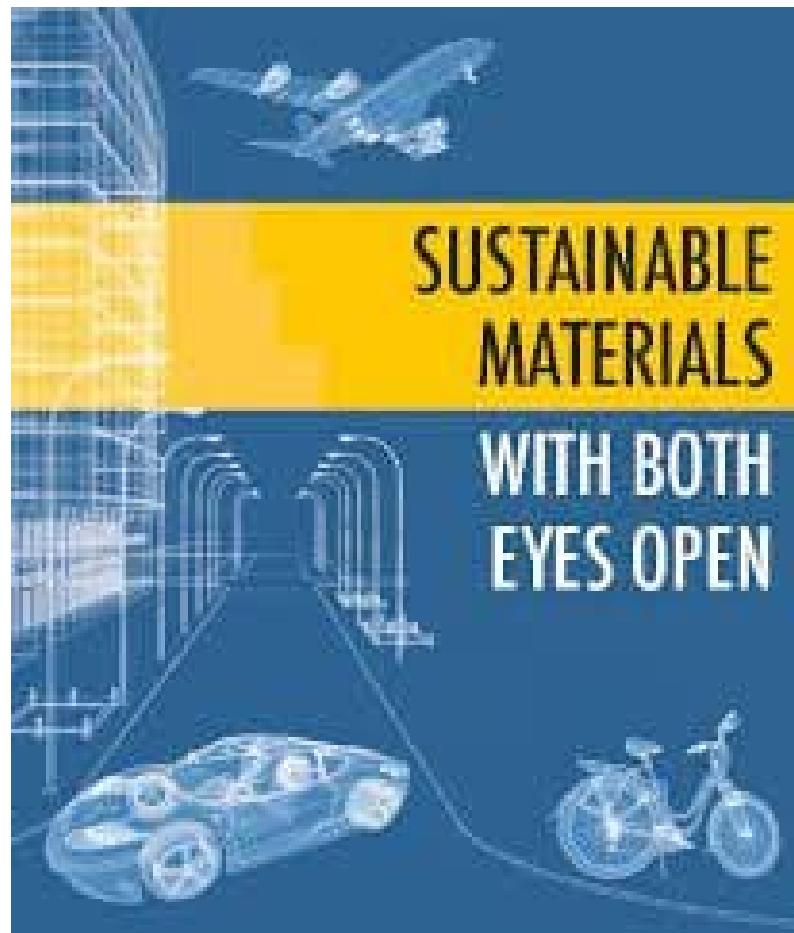
How to address issues?

A systemic view to microplastic pollution can be found by studying the laundry practices of people and what cleanliness means for them.

Svartström A. (2019): Towards reducing microplastic fiber pollution in local and global waterways. Master thesis in Creative Sustainability.







Allwood et al on materials (and the embedded CO2 emissions)

Material use, and particularly mining, is the hidden source of unsustainability.

Fundamental for modern/urban lifestyles

High in volume and space

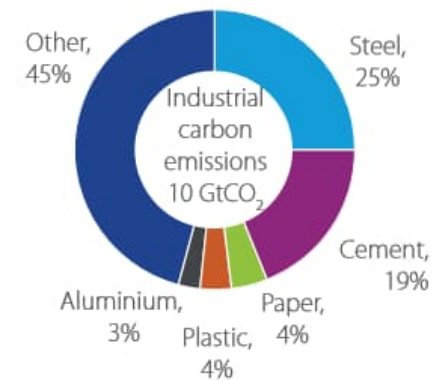
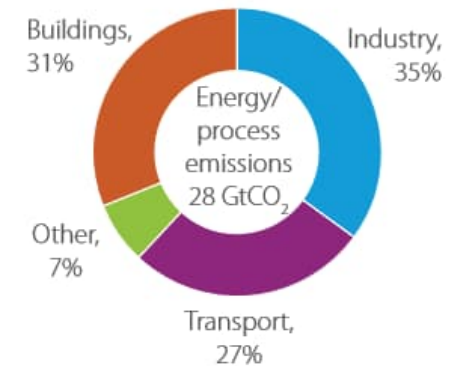
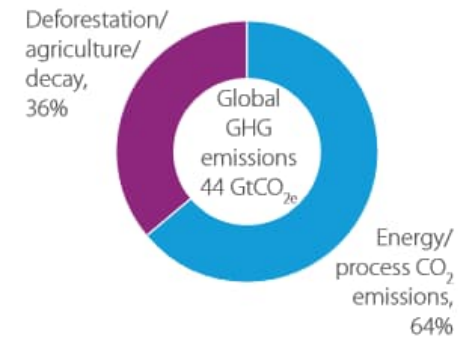
Toxic by-products

Rare and subject to conflict



Allwood et al ch2

- **Most of CO₂ emissions are due to energy use and processes.**
- **Industrial processes are the single biggest source of CO₂**
- **Steel, cement, aluminum, paper and plastics are most important materials 'behind' CO₂ emissions.**



Allwood et al ch2

Industrial production and treatment of materials accounts for half of worlds CO2 eq emissions.

A further breakdown of emissions in China give a proxy for the whole world.

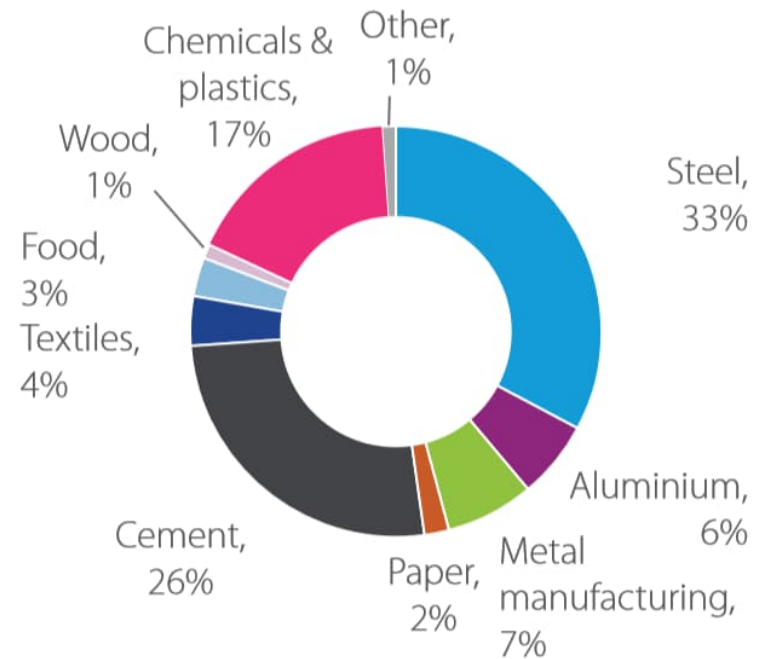


Figure 2.4—Sources of Chinese CO₂ emissions

For next time

Read the text by Ceschin and Gaziulusoy

Calculate carbon footprint with SITRA's lifestyle calculator
<https://lifestyletest.sitra.fi/>

Place your footprint score at <https://flinga.fi/s/FQH5S2W>
You are also free to choose to place your score anonymously without your name.

Indicate your groupwork preferences when Tatu announces a survey on topic interests.