



Aalto University
School of Arts, Design
and Architecture

Sustainable design S1

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21.11.2019

Agenda

9.15 - 10.15

Course syllabus and teacher introductions.

'Where do you think change comes from' exercise <https://flinga.fi/s/FQJP4ZQ>

10.15 - 10.25

What is sustainability? What did you do in the previous courses.

10.40 - 11.10

Sustainability approaches and priorities

- *Planetary boundaries, 'Radar'*
- *IPAT, 'Economy'*
- *Circular economy, 'Butterfly'*
- *Safe and just space for humanity, 'Donough'*

11.25-11.45

The text Allwood et al / Design 'for priority materials'

**Teaching:
Creative Sustainability
English BA Design**

**Research: Time use,
renewable energy,
energy efficiency, DIY**

**Emerging interests:
Energy justice,
Carbon drawdown
Eco-welfare state**



TOWARDS ECO-WELFARE STATE



Aalto ARTS Design alumni

Teaching:

- *Sustainable Design* (Design BA)
- *Design Approaches To Sust. Consumption*
- *Eco-Auditing* (CS MA)

Research:

Transition research, strategic codesign, ecodesign





Pirjo Kääriäinen
*Professor, Design and Materialities
Aalto University*

**CHEM
ARTS**



A!

Let's discuss sustainability aspects related to our everyday materials such as textiles.

Course schedule

Week	Weekd.	Date	No.	Session topic
1	Tue	20.4.	1	Intro: Key concepts and concerns of sustainability.
	Thu	22.4.	2	Multi-level design model; Strategies on different levels
2	Tue	27.4.	3	Tools to guide product design and certify performance
	Thu	29.4.	4	Communicate sustainability with design
3	Tue	4.5.	5	Sustainability research; Impact assessment and Granta Edupack
	Thu	6.5.	6	Product redesign: Strategies for life cycle extension
4	Tue	11.5.	7	Redesign exercise: presenting assessments and redesigns
	Thu	13.5.		No class: Ascension day
5	Tue	18.5.	8	Design with materials; Groupwork begins
	Thu	20.5.		No class: Independent groupwork
6	Tue	25.5.	9	Tutoring sessions for groupwork
	Thu	27.5.		No class: Independent groupwork
7	Tue	1.6.	10	Design with materials: Presenting results of groupwork

Grading

Course work and evaluation consist of

- Session-related independent assignments (30% of grade evaluation),
- A bigger group work on conceptual design (30%),
- Personal learning diary (40%).

Instructions for the learning diary are given at the Assignments section of the MyCourses page.

- There are questions to write on for many of the sessions.
- Cover these, but don't have to limit your diary to them.
- 5-7 pages / 2000-3000 words.

Sessions 2-4: Footprinting and communicating sustainability

- **For session 2:** Calculate your carbon footprint with SITRA's lifestyle calculator. Place your result on a Flinga board. Indicate also whether you think your score is high or low.
- **For session 3:** Select three different sustainability-related product/service labels, and find out who grants them and what is the main criteria
- **For session 4:** Beyond labels and standards: pick a product that communicates sustainability in an interesting, surprising, unconventional or controversial way

Sessions 5–7: Assessment & redesign exercise

Part 1 (session 5): Select a topic for the exercise and begin research on its sustainability impacts

- Pick a topic for exercise (product/service/system/material)
- Identify major sustainability issues and impacts along the life phases

Part 2 (session 6): Redesign ideation – suggest improvements

- Present your topic briefly in class, then...
- Redesign your focus product/system/material use

Produce a poster (for session 7): Communicate sustainability improvements

- Produce a poster to communicate results
- Present with 5 min pitch on session 8

Sessions 8-10: Design with materials

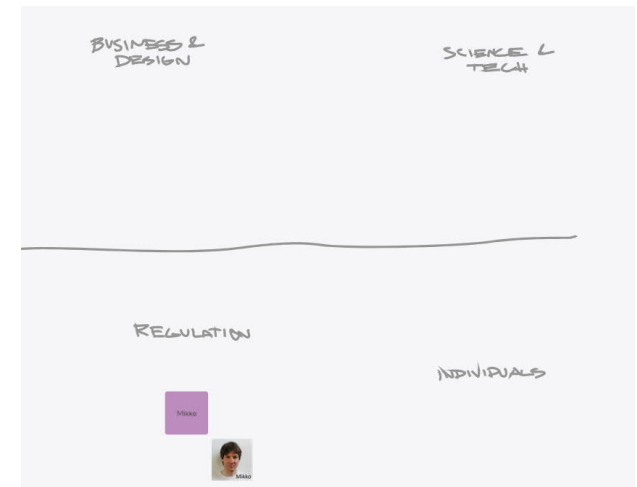
For the final part (weeks 5-7) you will be working in teams of 3-4 students to develop a material-related concept. Teams will be formed based on your interests.

You can start to list your interests here, final date is 7.5.:
<https://flinga.fi/s/F7KRFMP>

Where do you think change comes from?

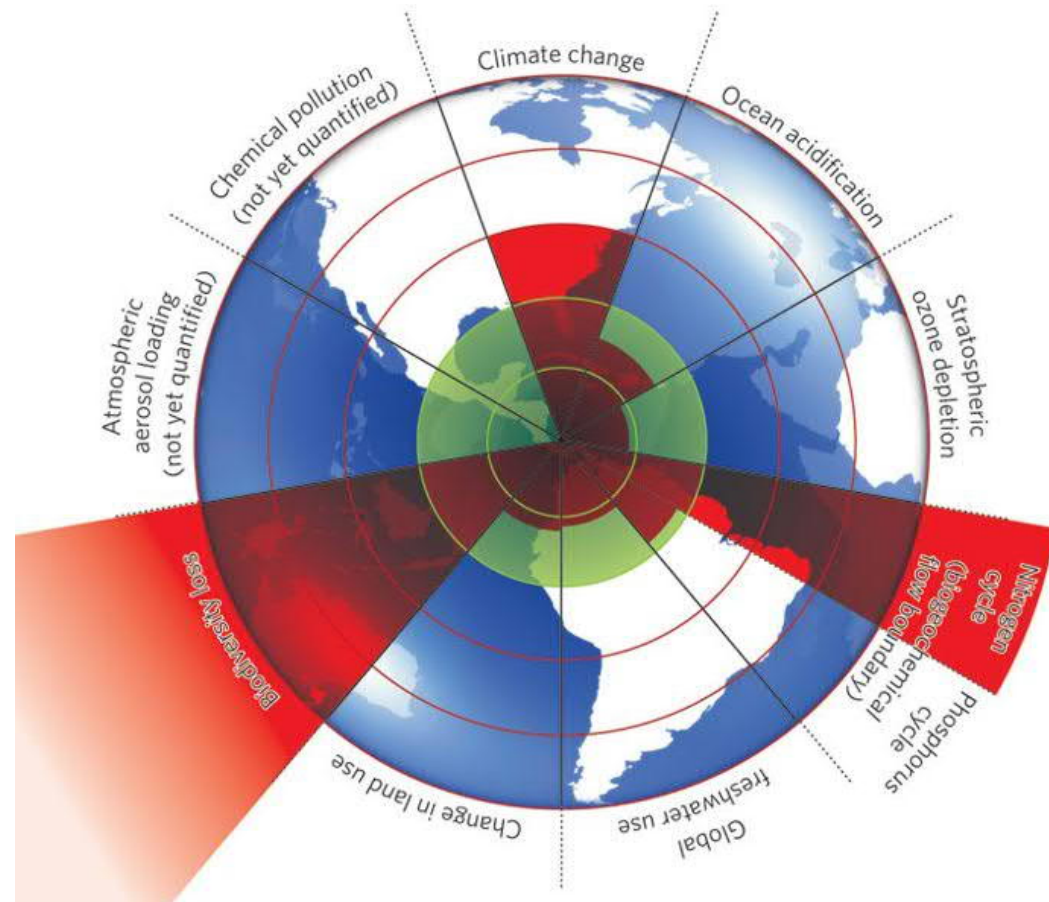
What are the driving forces

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



Go to Flinga <https://flinga.fi/s/FQJP4ZQ> and place a sticker on the whiteboard with your name. Instead of a sticker, you can place your photo with your name on it.

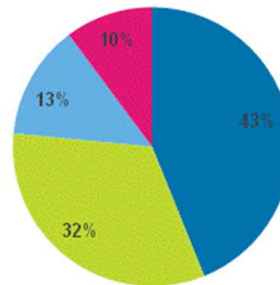
Planetary boundaries



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=qLV4wjdac8A>

I=PAT

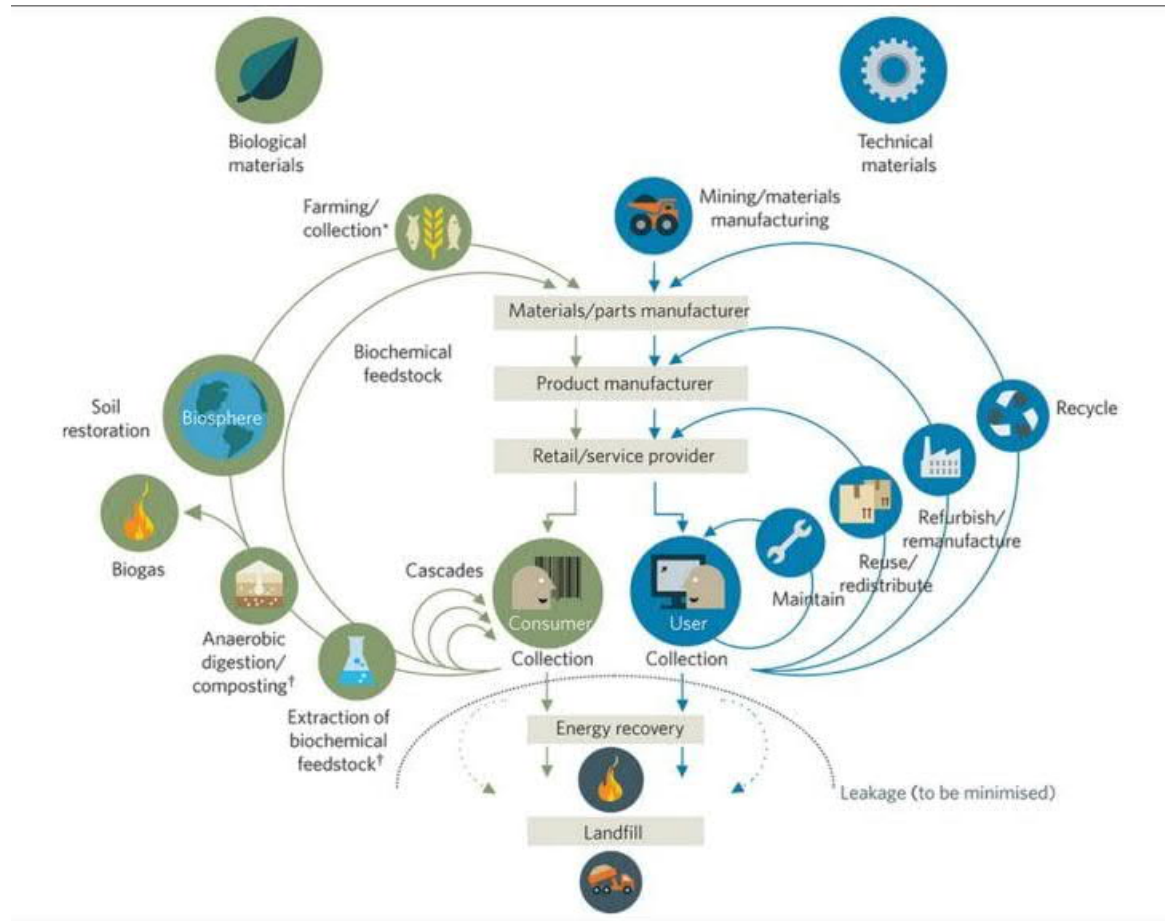
$$\text{Impact} = \text{P}_{\text{opulation}} \times \text{A}_{\text{ffluence}} [\text{€}] \times \text{T}_{\text{echnology}} [\text{impact/€}]$$



■ Service ■ Manufacturing ■ Trade ■ Construction

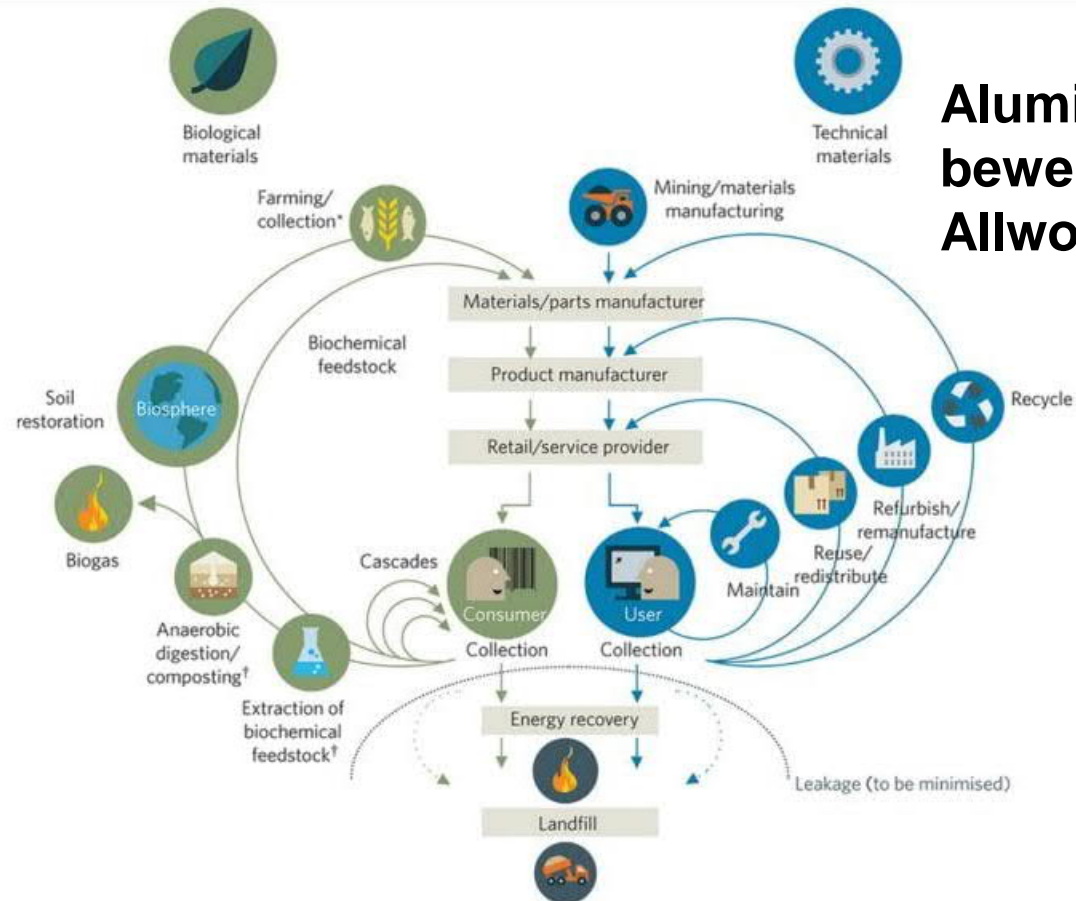


Circular economy



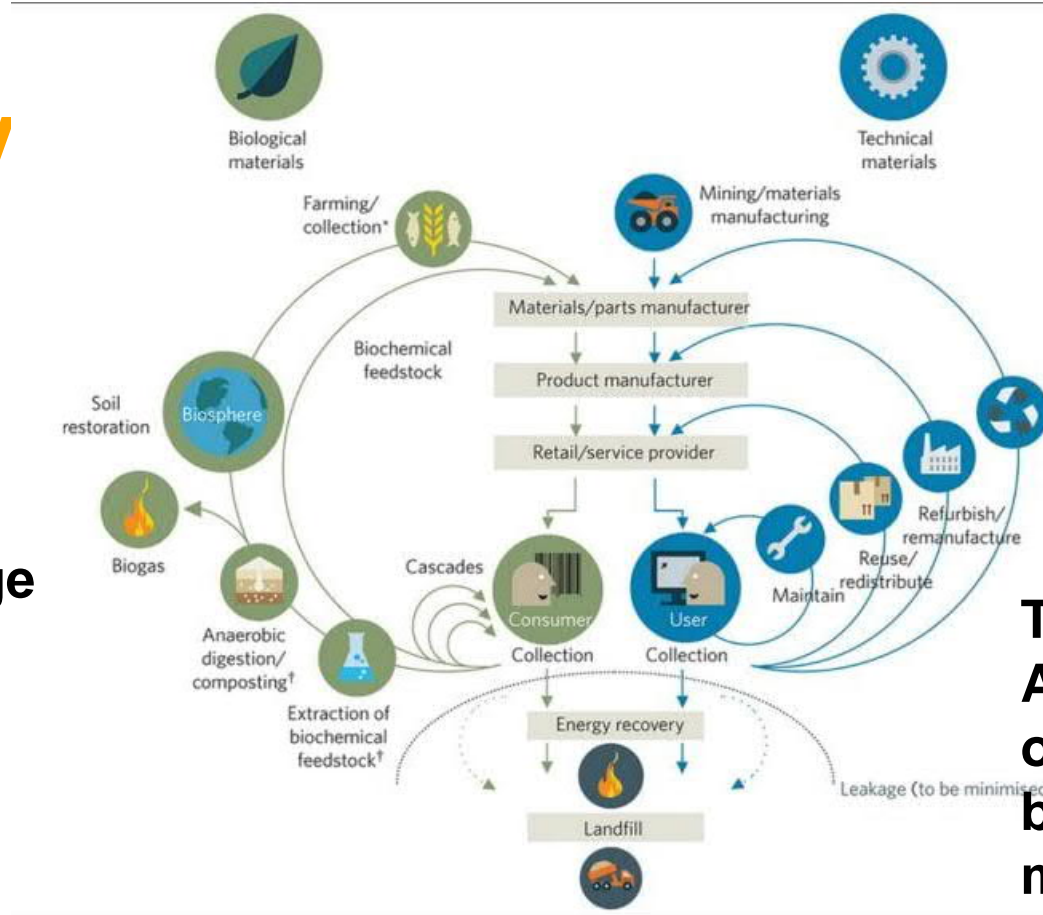
Circular economy

Aluminium beverage can in Allwood et al ?



Circular economy

Biodiversity!
Land use!
Carbon storage



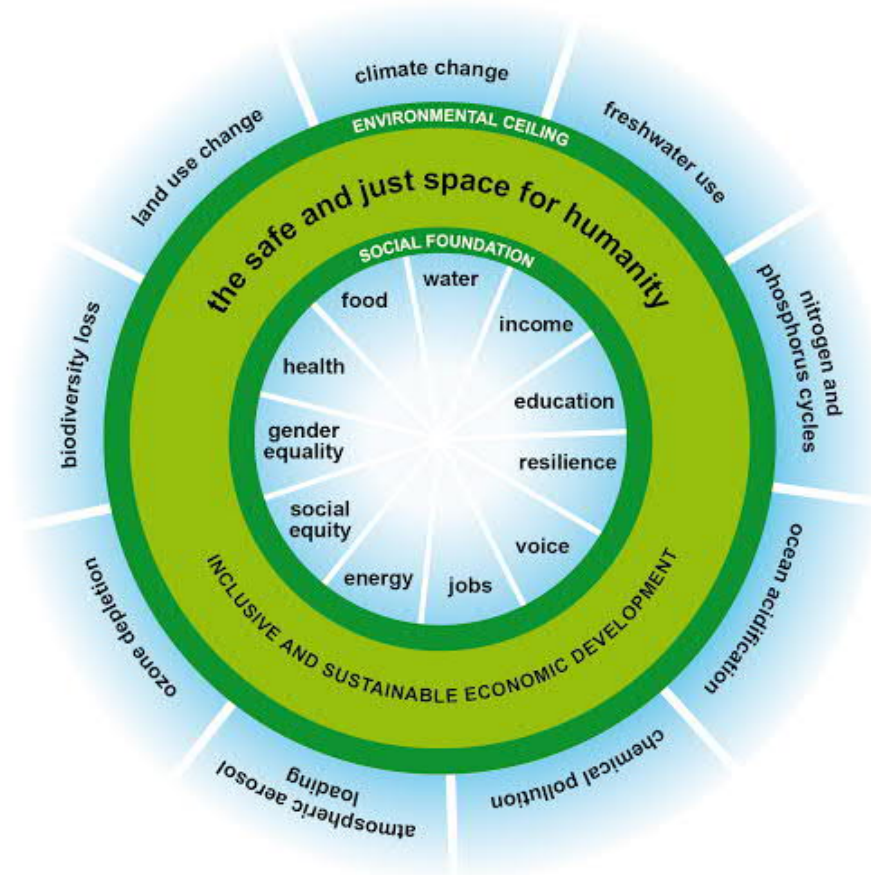
Loss/
quality of the
material
stock!

Critical
materials

Toxicity /
Accumulation
of non-
biodegradable
materials

Safe and just space for humanity

Raworth 2012

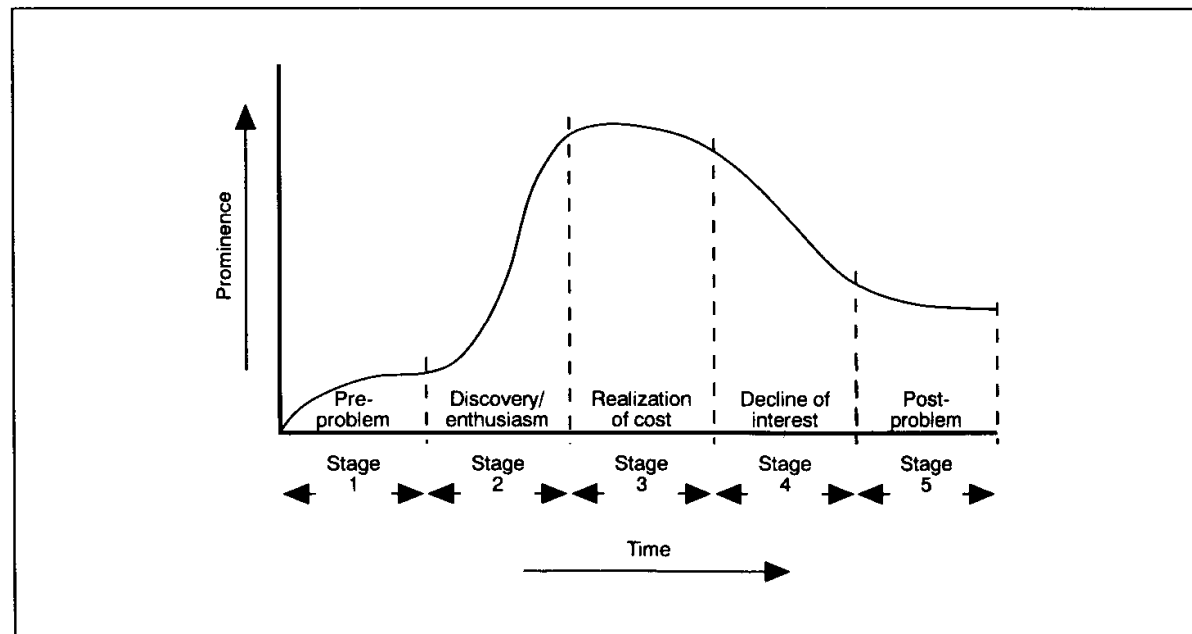


What issues to address: what is topics, when to get engaged

Caught in the 'topical'

'News' as entertainment

Dramatised bad news vs hidden processes of decay



Based on Downs, A. (1972). Up and down with ecology: The issue-attention cycle. *The public*, 462-473.

Emergence of microplastics discourse

The scientific 'discovery' took place in 2005.

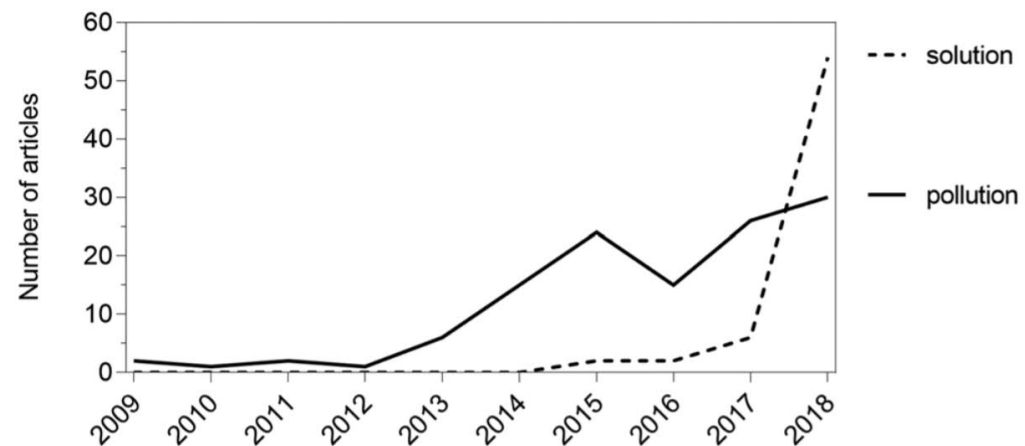


Figure 2. Number of published media articles on (micro)plastics per year addressing two main topics, $n = 186$.

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



Allwood et al on materials:

Steel, aluminium , concrete, plastic, paper

Materials-related sustainability concerns (ch1)

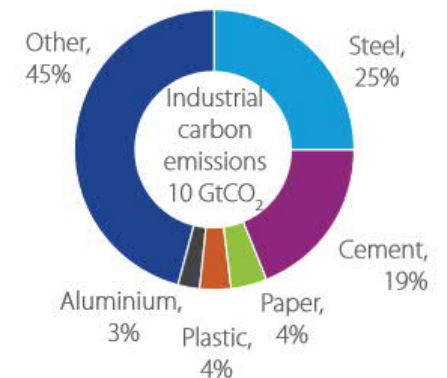
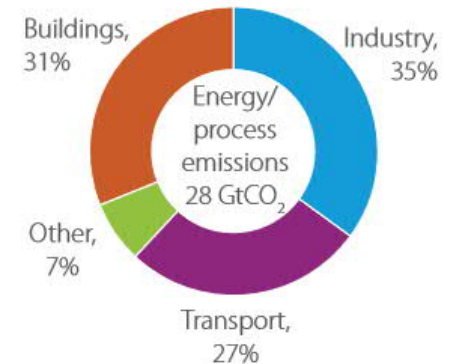
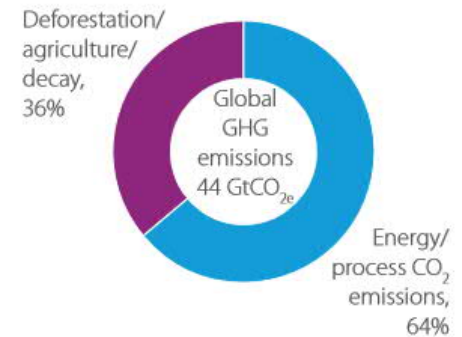
- Critical for modern/urban lifestyles
- High in volume and space
- CO2
- Toxic
- Rare



Why 'With two eyes open'?

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, aluminium, 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.

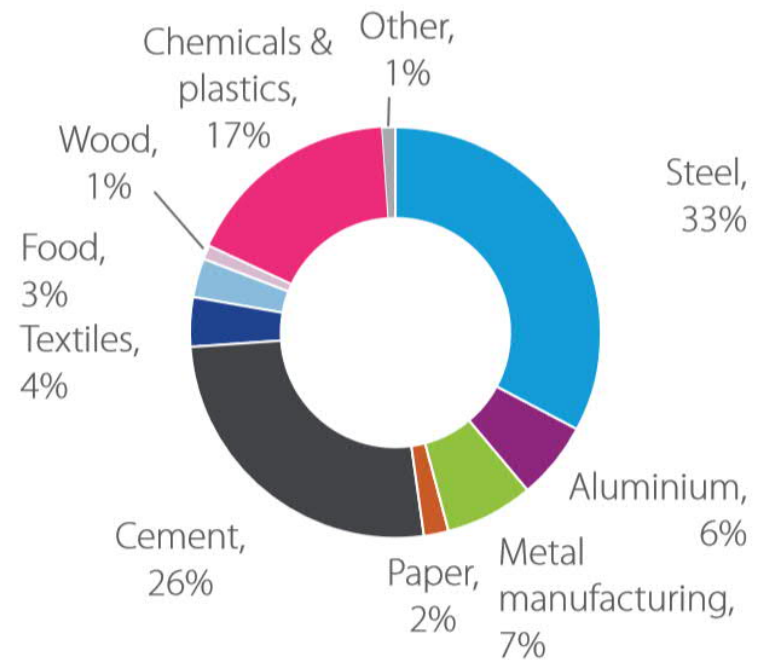


Figure 2.4—Sources of Chinese CO₂ emissions

Life cycle impacts

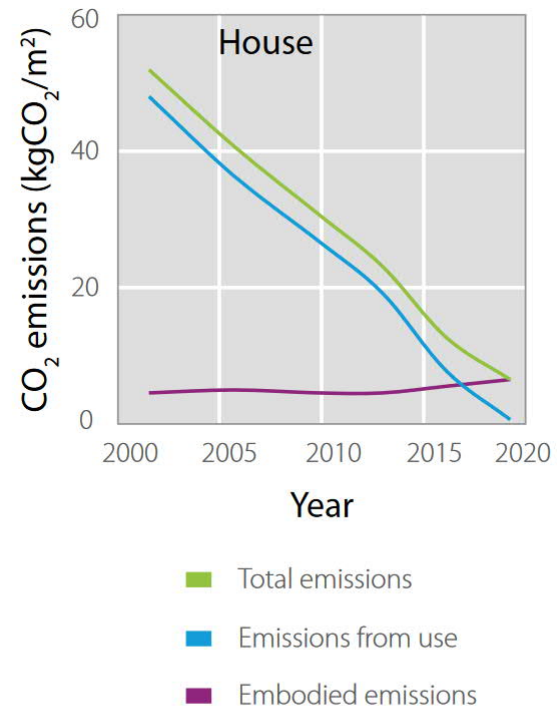


Figure 2.3—CO₂ emissions per square metre for buildings¹⁶

Source: Allwood et al. Ch2

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 not to place your score at Flinga.