



Aalto University
School of Arts, Design
and Architecture

Sustainable design S3

Product labels: Tools to guide product design
and certify performance

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29.4.2024

Agenda

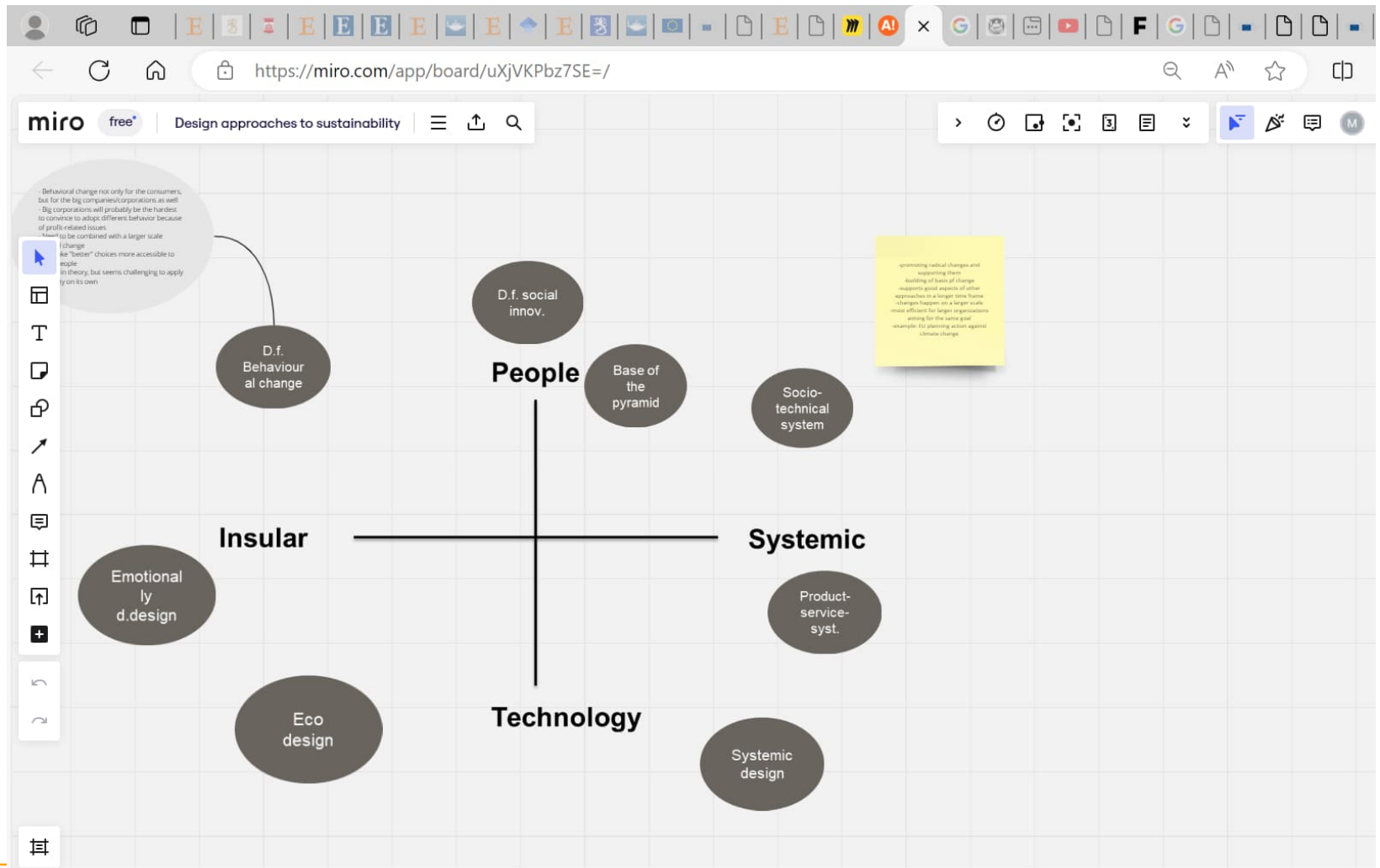
13.15 - 13.30 Last session: Multiple levels / approaches of design for sustainability

13.30 - 14.30 Labeling and certification schemes
break

14.45-15.00 What labels did you choose: place them on the Flinga-grid (link at My Courses Announcements)

15.00-15.30 Discussion

11.30-11.45 Next session: How do products/services communicate sustainability



Product labels and certification schemes

Type 1 (e.g. Nordic Swan and EU Ecolabel’): Publicly agreed criteria for superior environmental, life-cycle performance within a product group.

Type 2 (Self-declared claims): Self-declared environmental claims. Must not be misleading)

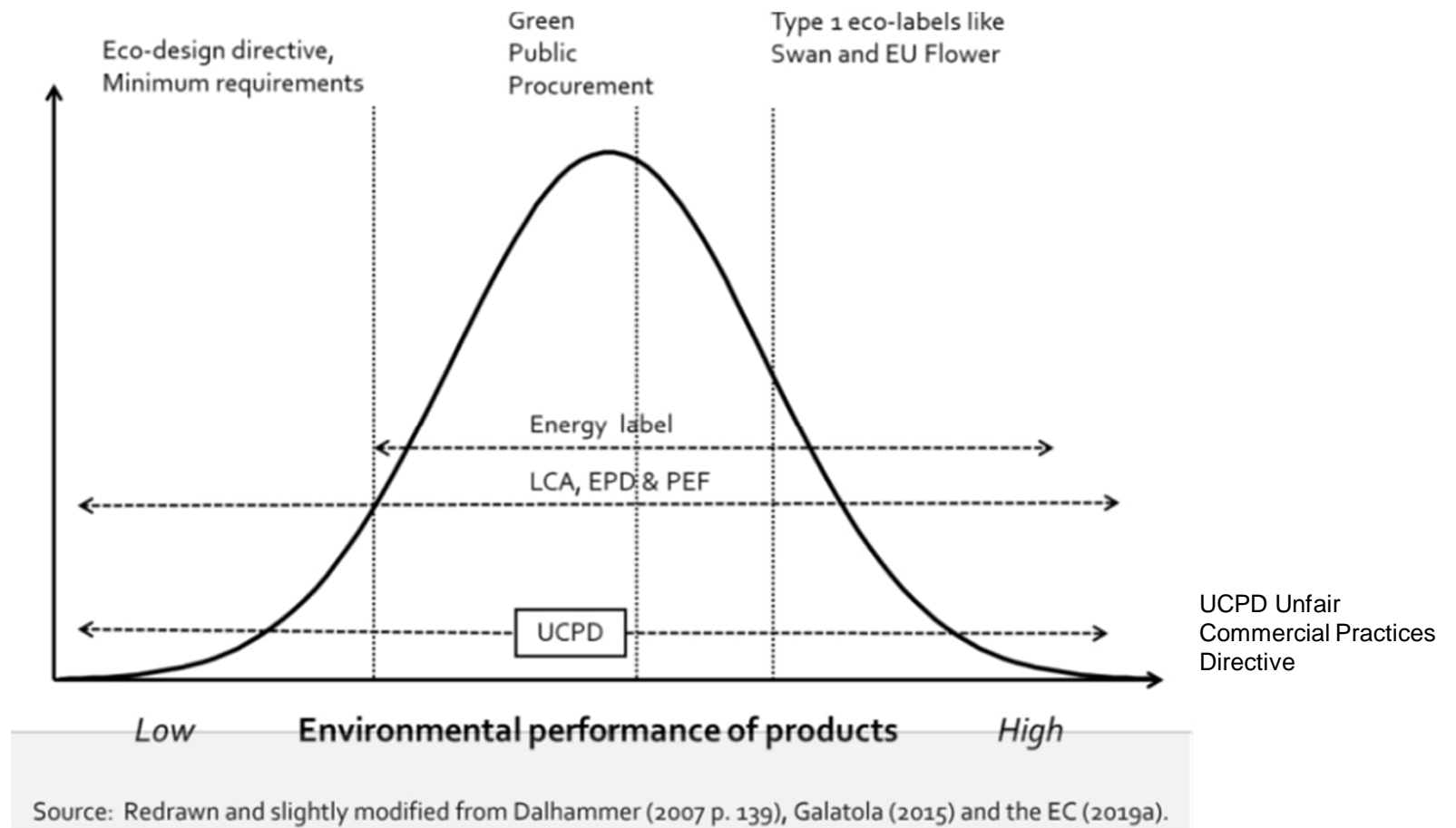
Type 3 (Environmental product declarations EPD): Quantified, verified information about product life cycle. B2B use mainly.

ISO 14000 standard series on Life Cycle Assessment and product declarations

EU (pending regulation: Product Environmental Footprint (PEF) and Organization

Environmental Footprint (OEF)

<http://norden.diva-portal.org/smash/get/diva2:1370715/FULLTEXT01.pdf>



EPD: Karat RE AB Ludvig Svensson

www.environdec.com

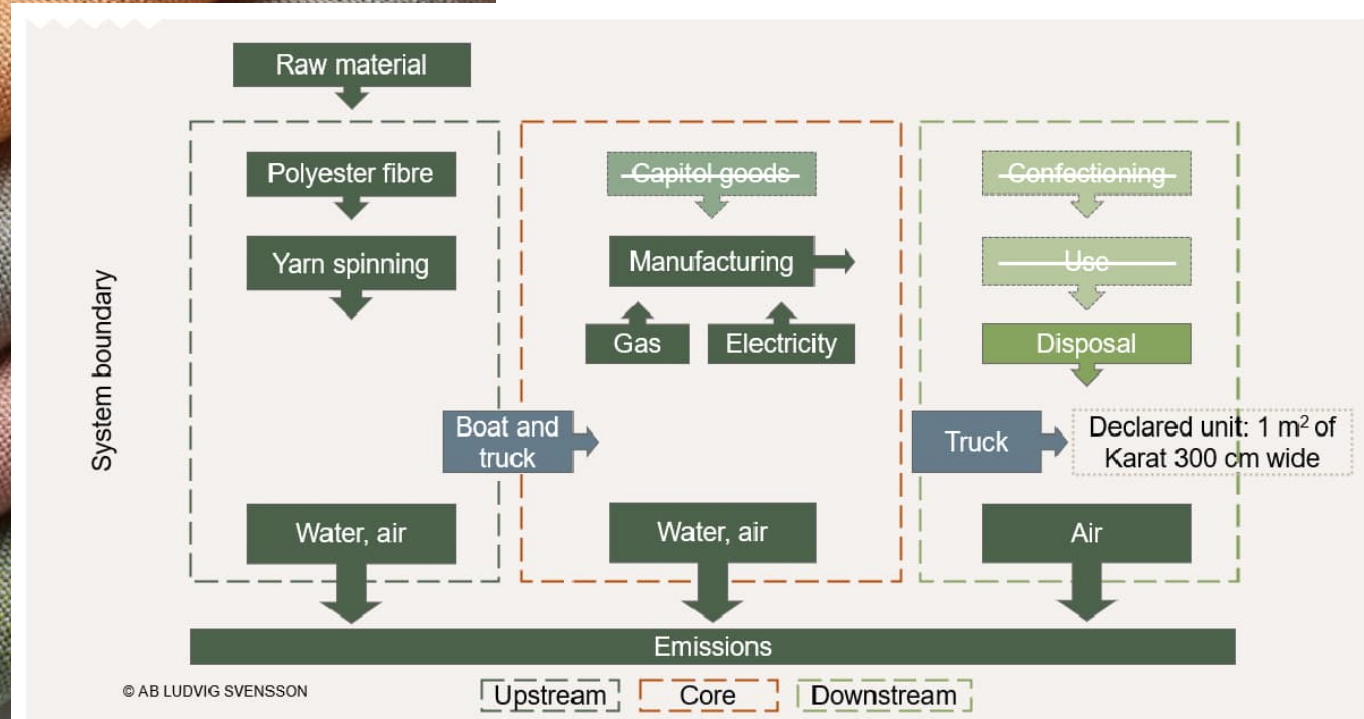
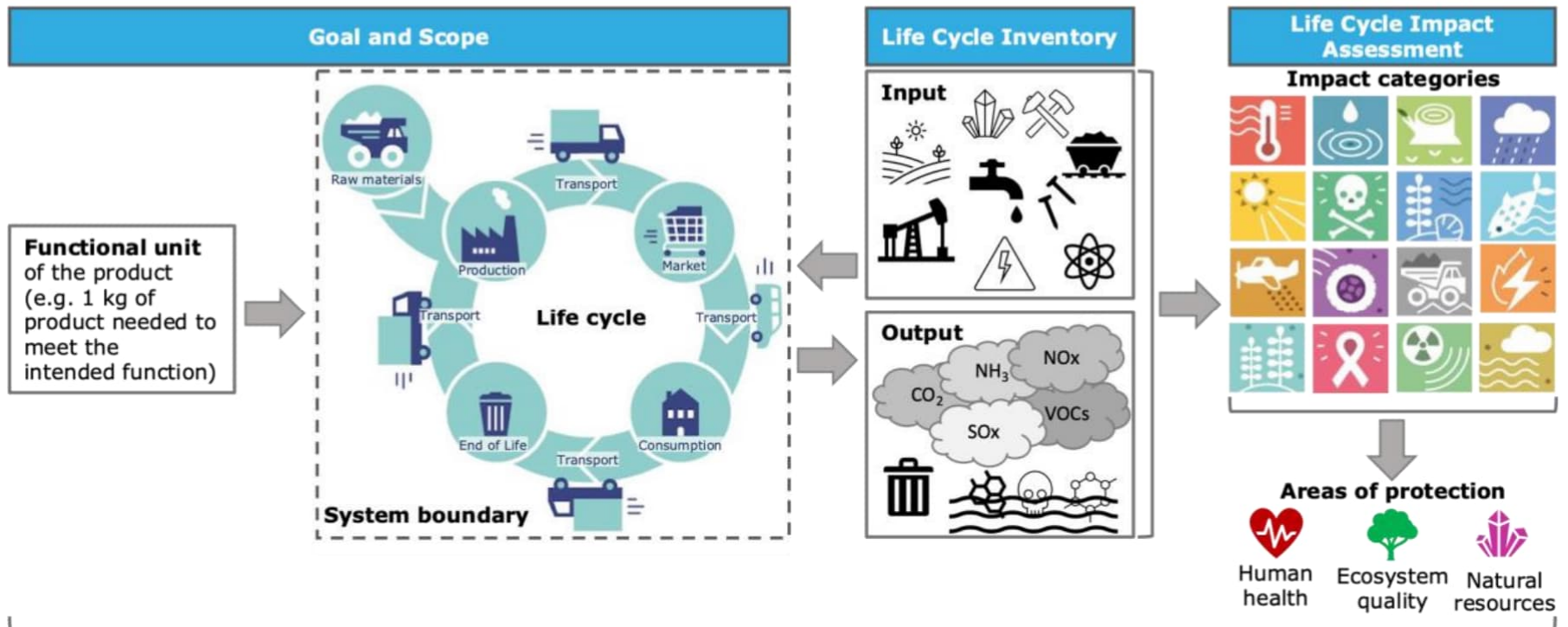


Table 3. Impact categories according to PCR on Karat

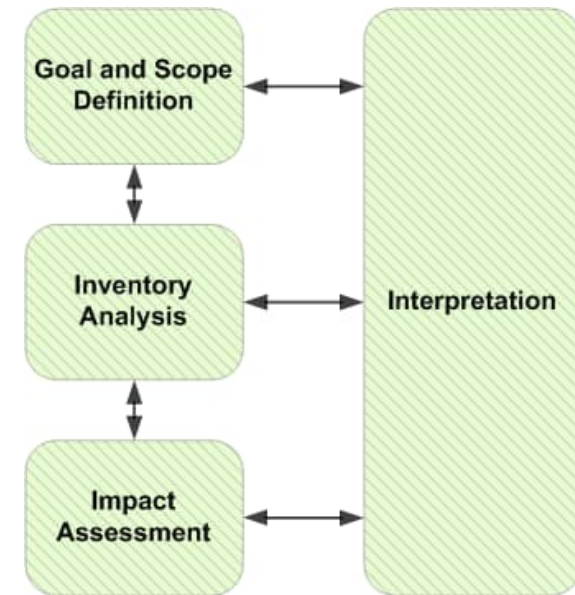
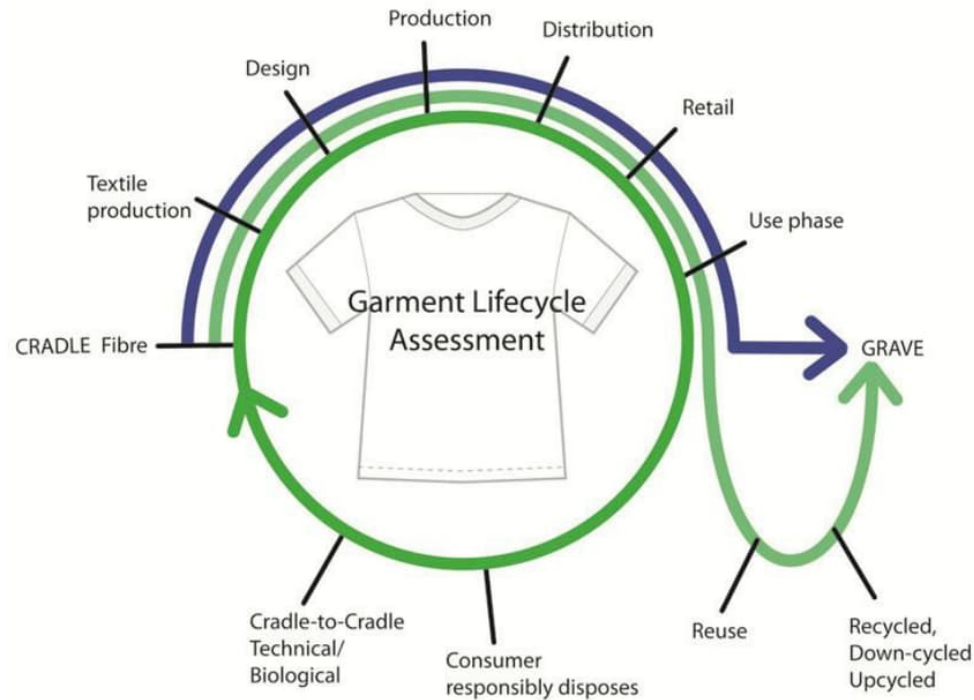
PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	1,21E+00	2,47E-01	3,91E-01	1,85E+00
	Biogenic	kg CO ₂ eq.	8,73E-03	3,23E-03	7,37E-06	1,20E-02
	Land use and land transformation	kg CO ₂ eq.	5,00E-04	4,38E-04	5,55E-06	9,44E-04
	TOTAL	kg CO ₂ eq.	1,22E+00	2,51E-01	3,91E-01	1,87E+00
Acidification potential (AP)		kg SO ₂ eq.	4,06E-03	1,67E-03	9,27E-05	5,81E-03
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	1,66E-03	5,91E-04	9,30E-05	2,35E-03
Formation potential of tropospheric ozone (POCP)		kg C ₂ H ₄ eq.	2,20E-04	9,26E-05	3,30E-06	3,16E-04
Ozon-depletion potential		kg CFC11 equivalents	1,81E-06	1,38E-07	2,83E-09	1,95E-06
Abiotic depletion potential – Elements		kg Sb eq.	7,35E-06	9,98E-06	6,08E-08	1,74E-05
Abiotic depletion potential - Fossil fuels		MJ, net calorific value	2,03E+01	1,17E+01	2,33E-01	3,22E+01
Water scarcity potential		m ³ eq.	4,64E-01	1,02E-01	3,96E-03	5,70E-01

Life cycle assessment (ISO14040)



Environmental Footprint methods (europa.eu)

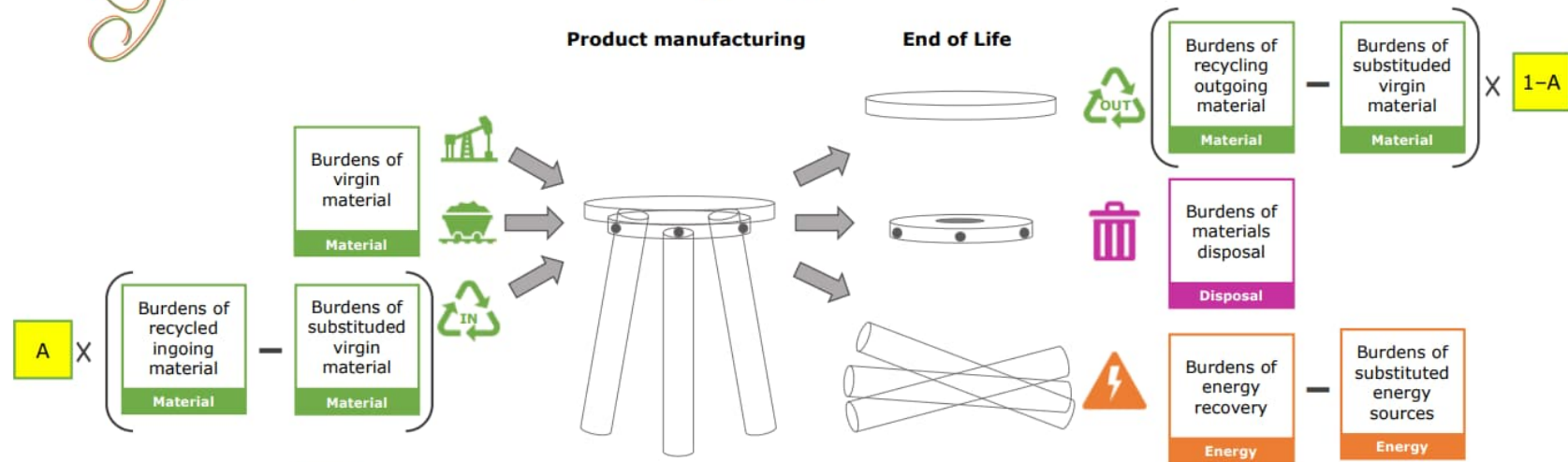
Life Cycle Assessment (ISO14040)



Payne (2011) The Life-cycle of the Fashion Garment and the Role of Australian Mass Market Designers. International Journal of Environmental, Cultural, Economic and Social Sustainability (7). DO 10.18848/1832-2077/CGP/v07i03/54938



Circular Footprint Formula = Material + Energy + Disposal



A Allocation factor of burdens and credits, based on supply and demand of recycled material

Example:
 A=0.2. Low offer of recyclable materials and high demand. Focus on recyclability at end of life
 A=0.8. High offer of recyclable materials and low demand. Focus on recycled content
 A=0.5. Equilibrium between offer and demand. Focus both on recyclability at end of life and recycled content

Material selection: rules of thumb

Green vs blue

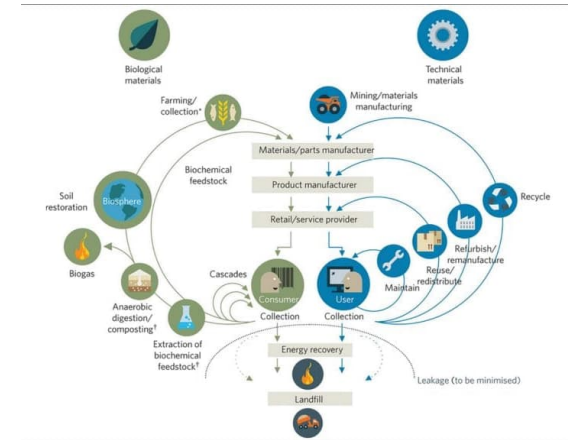
Waste from another process

**Recycled material, in the loop
vs down-cycled**

Recyclable

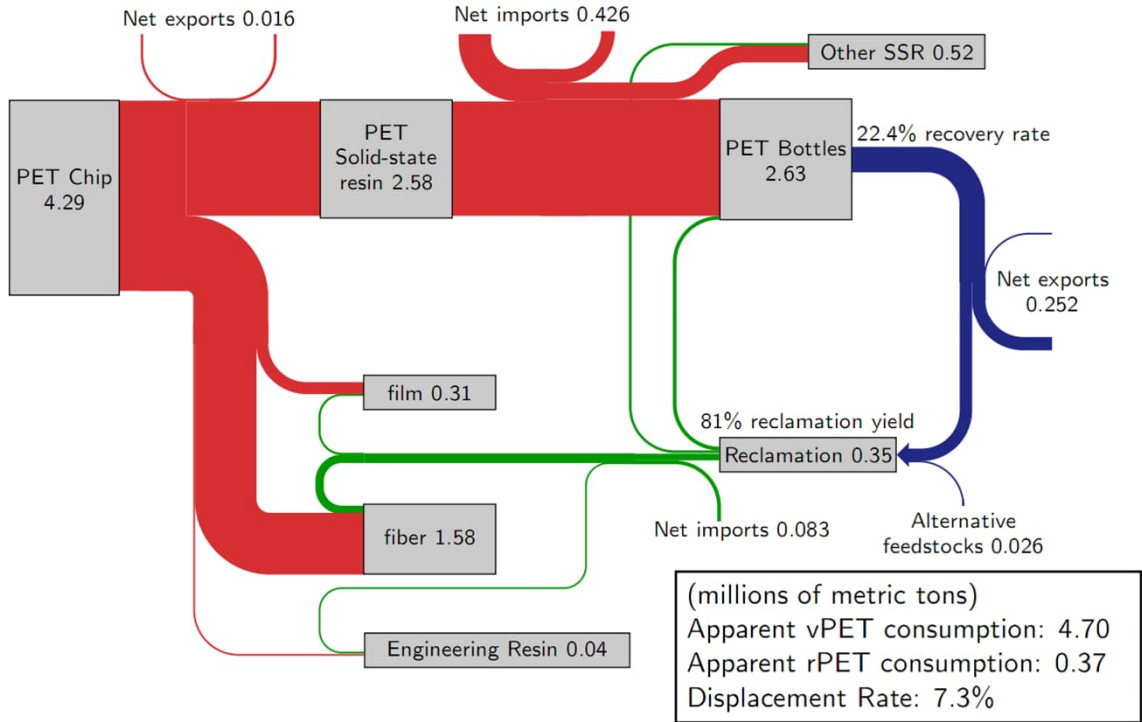
Non-toxic and safe

Biodegradable



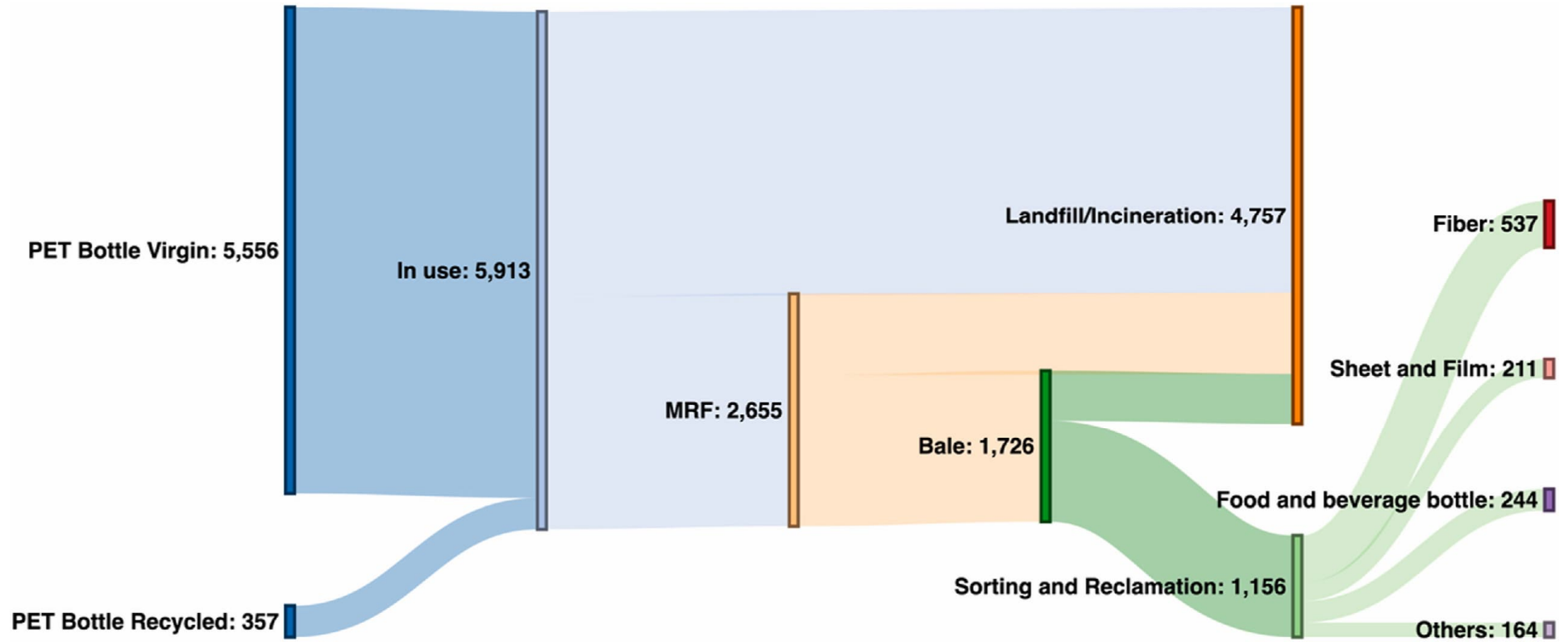
Material flow of single material:

PET Material Flow – US (2006)



(PET beverage bottle recycling by B. Kuczenski and R. Geyer, University of California, Santa Barbara)

US PET bottle m-pounds 2017



<https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

Ghosh, T., Avery, G., Bhatt, A., Uekert, T., Walzberg, J., & Carpenter, A. (2023). Towards a circular economy for PET bottle resin using a system dynamics inspired material flow model. *Journal of Cleaner Production*, 383, 135208.

The use of rPET in bottles

- EU targets: 25% recycled material by 2025 and 30% by 2030





The European Green Deal

- [Making the EU climate neutral by 2050](#)
- [Protecting vulnerable workers and societies](#)
- [Supporting people and regions affected by increasingly frequent climate events](#)
- [Supporting farmers to withstand the consequences of climate change](#)
- [Financing green reforms and investments](#)
- [Putting a price on carbon](#)
- [Improving energy efficiency, energy security and reducing dependence from Russia thanks to REPowerEU](#)
- [Enhancing the competitiveness of Europe's net-zero industry](#)
- [Keeping our green industry competitive and avoiding carbon-leakage with the Carbon Border Adjustment Mechanism](#)
- [Restoring the wealth of our environment](#)
- [Clean transition dialogues to listen to relevant stakeholders](#)

EU: Sustainable products initiative

[**The Sustainable Products Initiative**] echoes the European Green Deal in pointing to the leading role that Europe's industry must play in this, by reducing its carbon and material footprint and embedding circularity across the economy, and underlines the need to move away from traditional models, and revolutionise the way we design, make, use and dispose of products.

The core of this legislative initiative is to extend the scope of the **Ecodesign Directive** beyond energy-related products so that it covers the broadest possible range of products and helps achieve a circular economy

Furthermore, the **Empowering consumers for the green transition initiative** will improve information on products at the point of sale in particular on their durability and reparability, and help prevent greenwashing and premature obsolescence.

Quotes from: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative_en

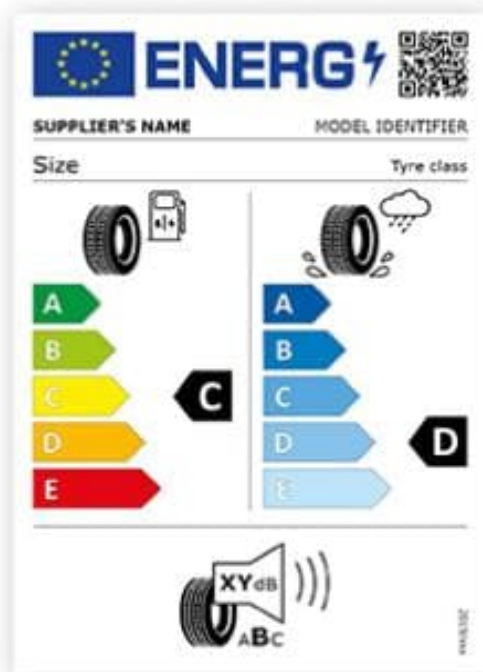
for a brief introduction of CEAP see [new_circular_economy_action_plan.pdf](#) (europa.eu)

Fit for
55

Circular
Economy
Action
Plan

Integrated
product
policy

Which products have existing criterias?



https://energy-efficient-products.ec.europa.eu/ecodesign-and-energy-label/product-list_en


Product List

All the products covered by the Directive 2009/125/EC and Regulation (EU) 2017/1369. Information on energy savings, energy labelling and ecodesign requirements can be found on each product page. The products are divided into separate categories.


PRODUCT CATEGORIES

- Cooking
- Cleaning and Drying
- Refrigeration
- Heating, Cooling and Ventilation
- Electronic Products
- Light Sources
- Tyres
- B2B Products


Cooking



Domestic Ovens
Ecodesign | Energy Label



Range Hoods
Ecodesign | Energy Label



H...
Ec...

[Energy efficient products \(europa.eu\)](https://energy-efficient-products.ec.europa.eu)

EU: Right-to-repair

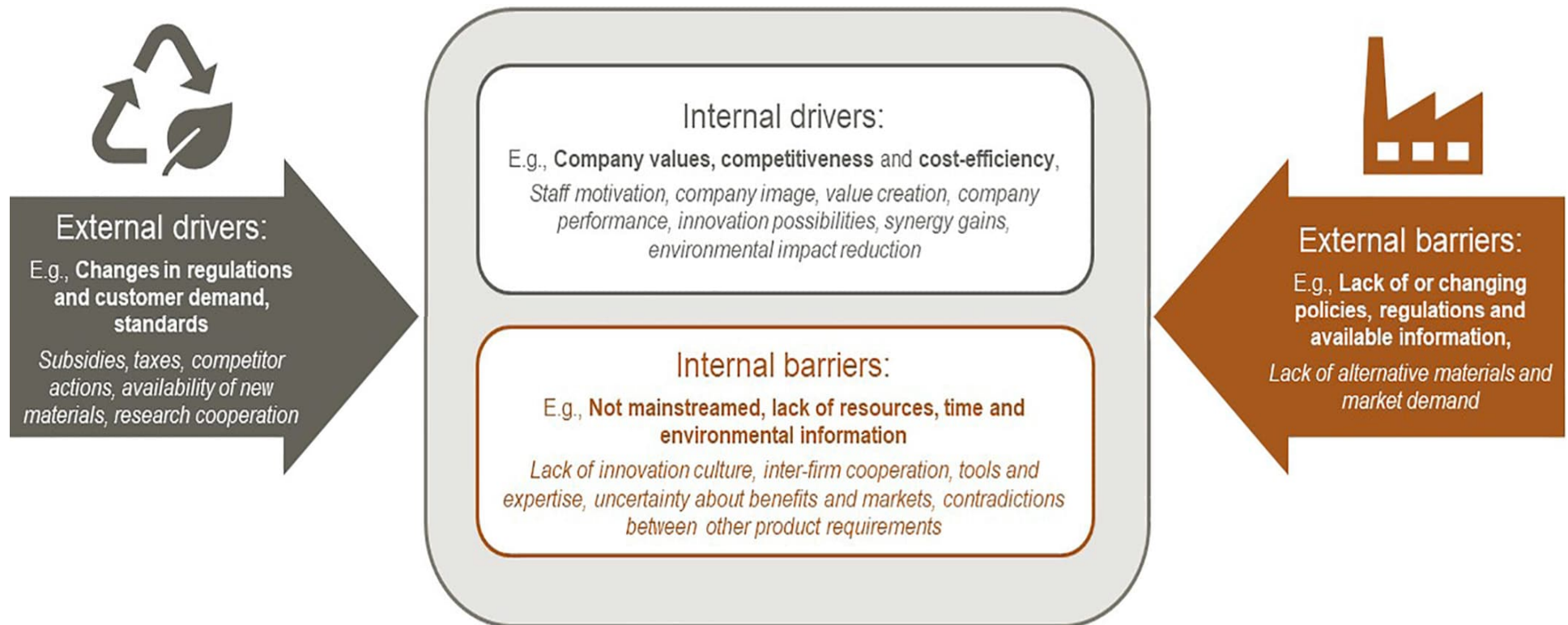
- prioritising repair whenever it is cheaper than replacement within the legal guarantee framework.
- an online platform at national level, matchmaking consumers with repairers and promoting refurbished goods.
- an obligation on repairers to issue upon request a quote on price and conditions for repair in a standardised form (European Repair Information Form).
- an obligation on producers of goods to which reparability requirements under Union law apply to repair outside the legal guarantee against a price.
- an obligation on producers to inform on their applicable obligation to repair.
- a voluntary EU easy repair standard (European Standard for repair services).

Source:https://eur-lex.europa.eu/resource.html?uri=cellar:cdbeea83-c94e-11ed-a05c-01aa75ed71a1.0001.02/DOC_1&format=PDF

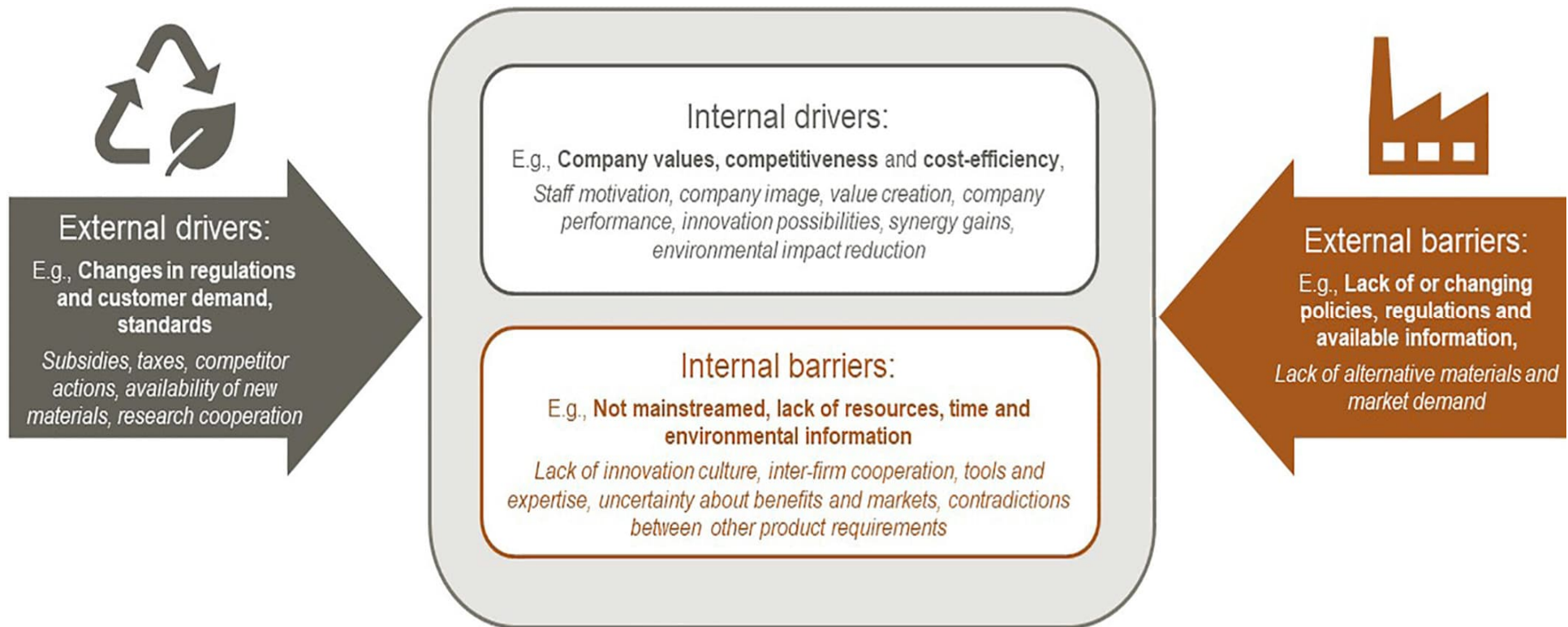
Is it appealing?

'In the European context, Dalhammar (**2016**) found that producers have a positive attitude towards energy efficiency standards and improved product durability or recycling, but a negative attitude regarding the use of recycled material and longer warranty periods' (Horn et al 2023)

Horn, S., Salo, H., & Nissinen, A. (2023). Promoting ecodesign implementation: The role and development areas of national public policy. *Environmental Policy and Governance*.
Dalhammar, C. (2016). Industry attitudes towards ecodesign standards for improved resource efficiency. *Journal of Cleaner Production*, 123, 155–166.



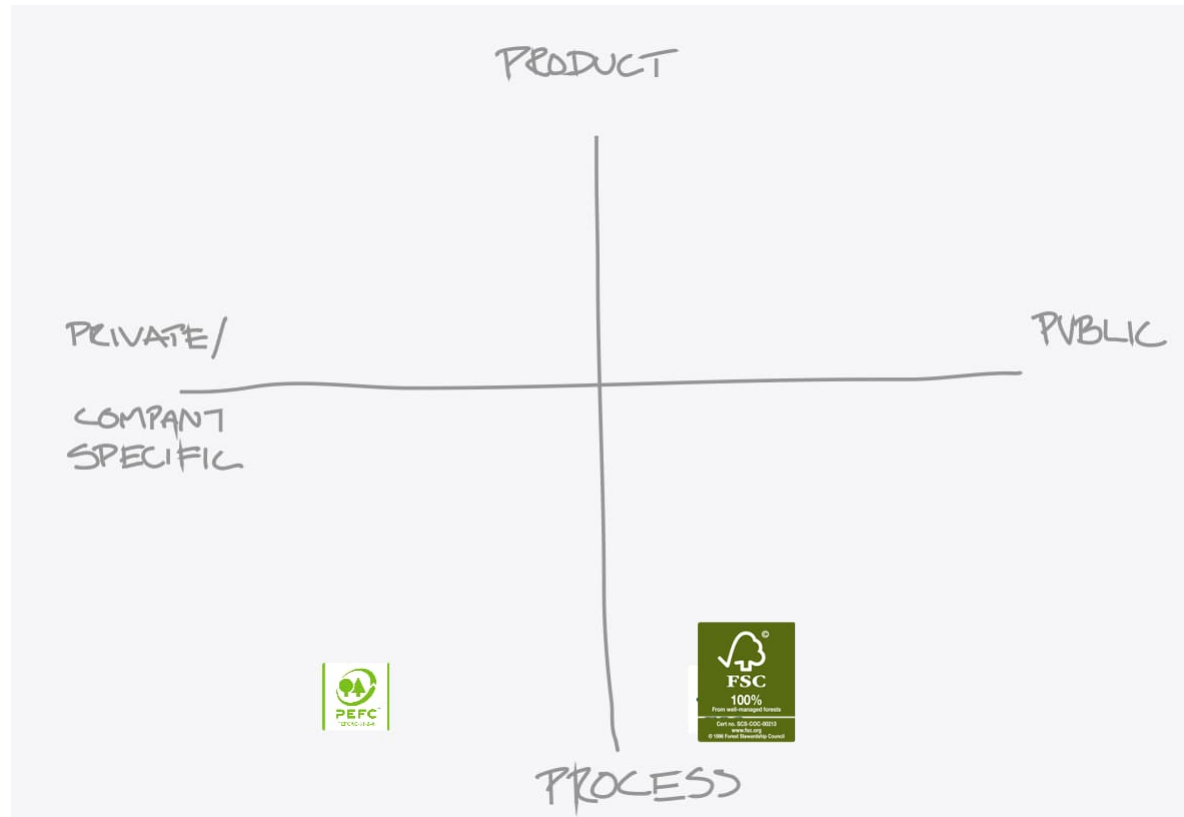
Most common drivers and barriers of ecodesign (Horn et al 2023)



How can designers better engage with and promote eco-design?

Label exercise

- Form groups of four
- Present the labels you chose to the others
- Go to...
<https://flinga.fi/s/F8ENP94>
- Place your label logos on the board according to whether they set mostly product or process criteria and are governed by private or public bodies.
- Place duplicates only if you disagree about the position



PRODUCT

PRIVATE/
COMPANY
SPECIFIC

PUBLIC

PROCESS



+
-
✕

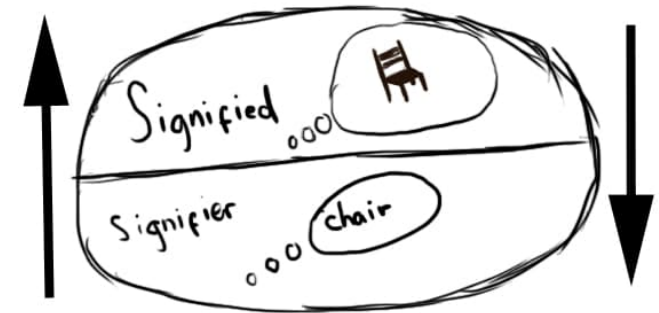
For next session

We move to think about the language, and visual language that is being used to evoke, express and communicate ‘sustainability’

Watch [An Introduction to Semiotics \(youtube.com\)](https://www.youtube.com/watch?v=...) –

This gives you an idea of the basic distinction between the *signifier* and the *signified*, and leads you to look for more free connotations around words and images.

Read Susan Vihma’s text (at the resources) in regard to what she (and semiotics) means by *index*, *icon* and *symbol*.



[Blog Archives - Language, linguistic code and speech \(weebly.com\)](https://www.weebly.com/blog/archives-language-linguistic-code-and-speech)

Next session: How does design speak?

Iconic – likeliness, metaphors

Indexical – traces of manufacture or origin

Symbolic – arbitrary, has to be learned

Exercise: Select a product/service that communicates sustainability effectively or interestingly or is controversial. Submit an image and observations on how and what the products communicates (appr 200 words). Use Susan Vihma's categories of semiotic meanings or other references. Mark your reference in the text and in your learning diary. Grade 1-5.