Aalto University
School of Arts, Design
and Architecture

Sustainable design S3

Product labels: Tools to guide product design and certify performance

Mikko Jalas
5.5.2023

Agenda

9.15 - 9.30	Forming of the groups Last session: Multiple levels of design for sustainability
9.30 - 10.30	Labeling and certification schemes
break	
10.45-11.00	What labels did you choose: place them on the Flinga-grid (link at My Courses Announcements)
11.00-11.30	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.

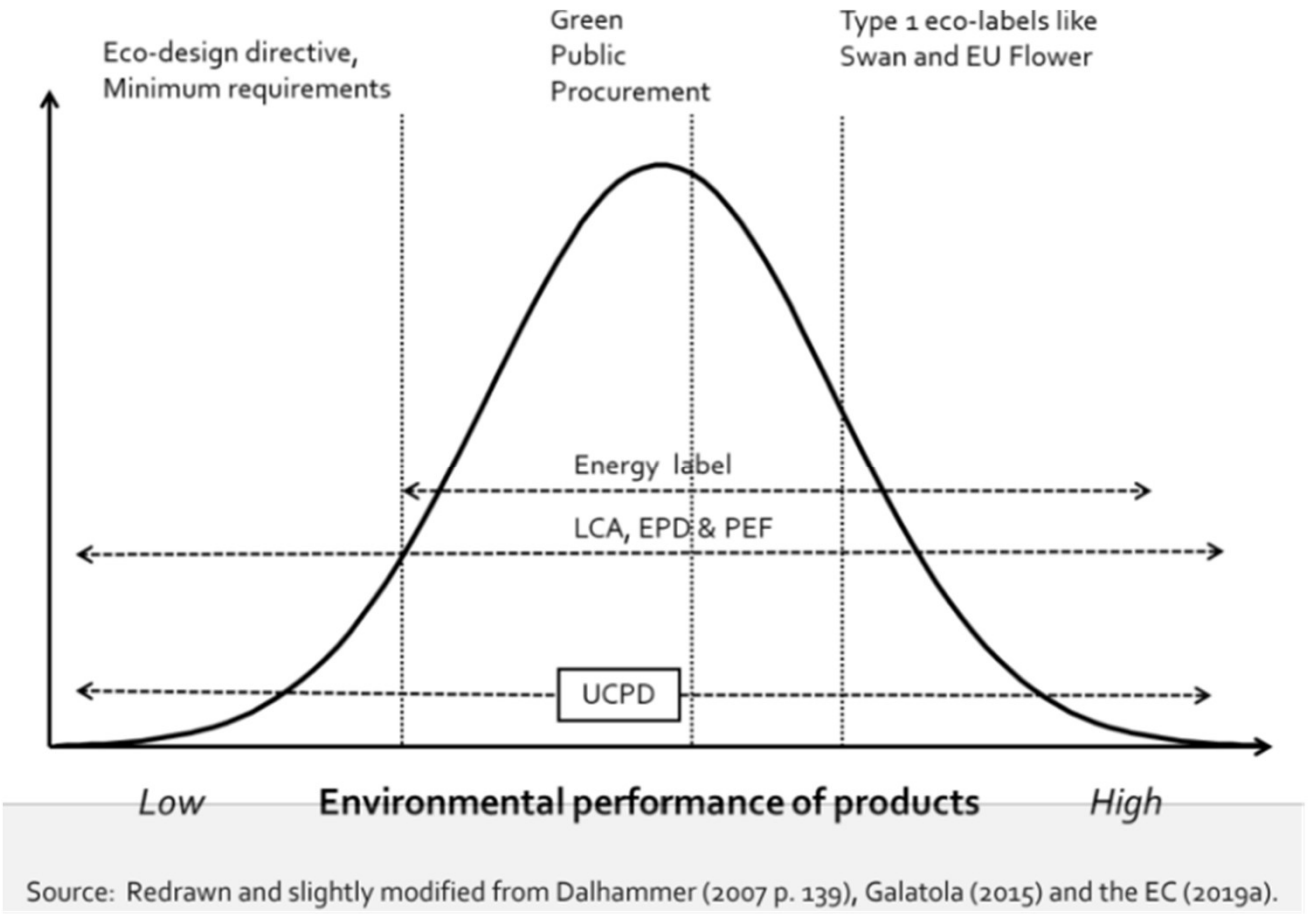
Type 2 (Self-declared claims): Self-declared environmental claims. Must not be misleading)

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)

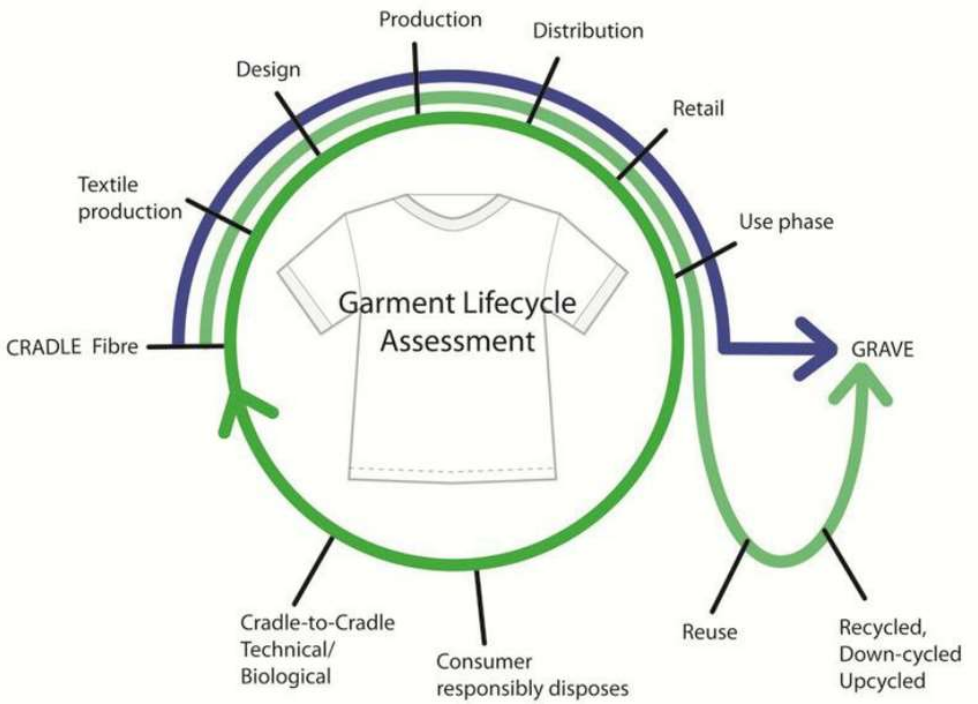
http://norden.diva-portal.org/smash/get/diva2:1370715/FULLTEXT01.pdf

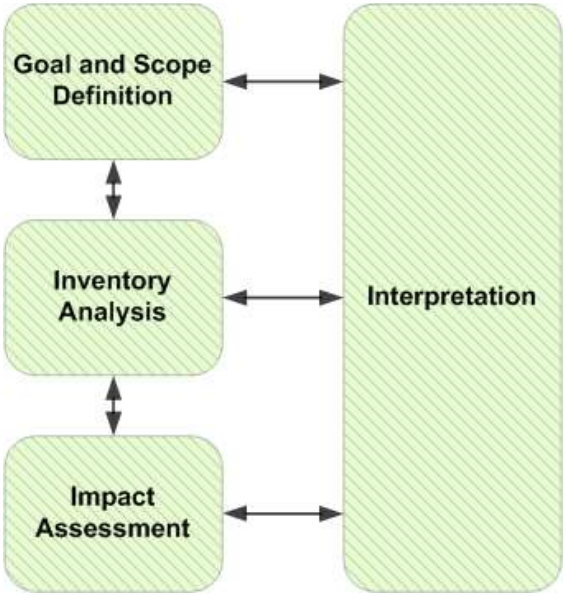


Source: Redrawn and slightly modified from Dalhammer (2007 p. 139), Galatola (2015) and the EC (2019a).

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

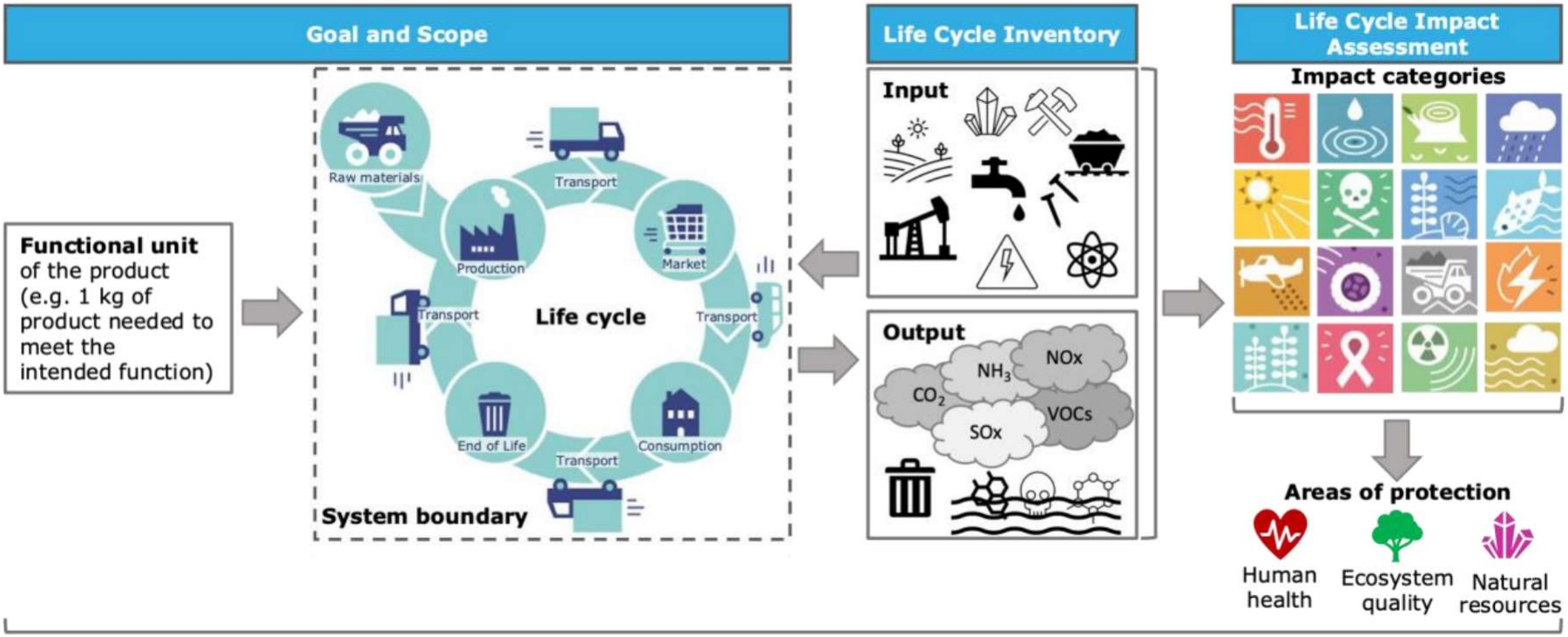
Life Cycle Assessment (ISO14040)





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

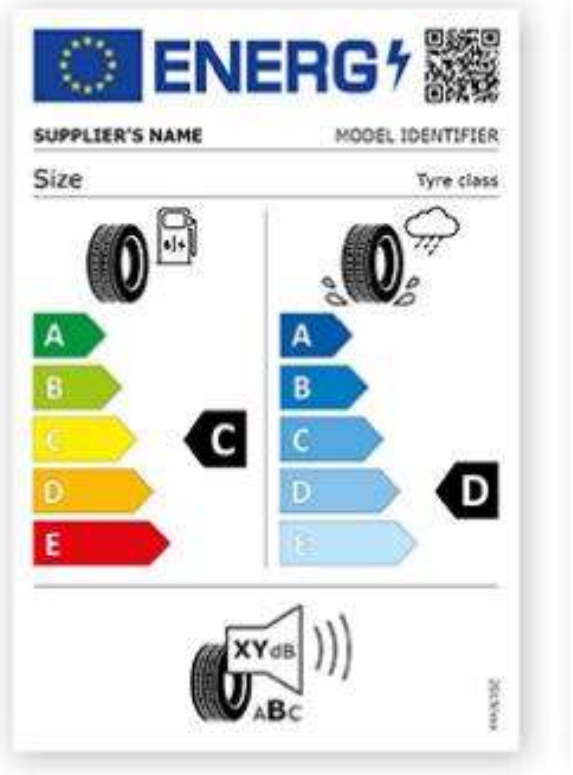
Life cycle assessment



Environmental Footprint methods (europa.eu)

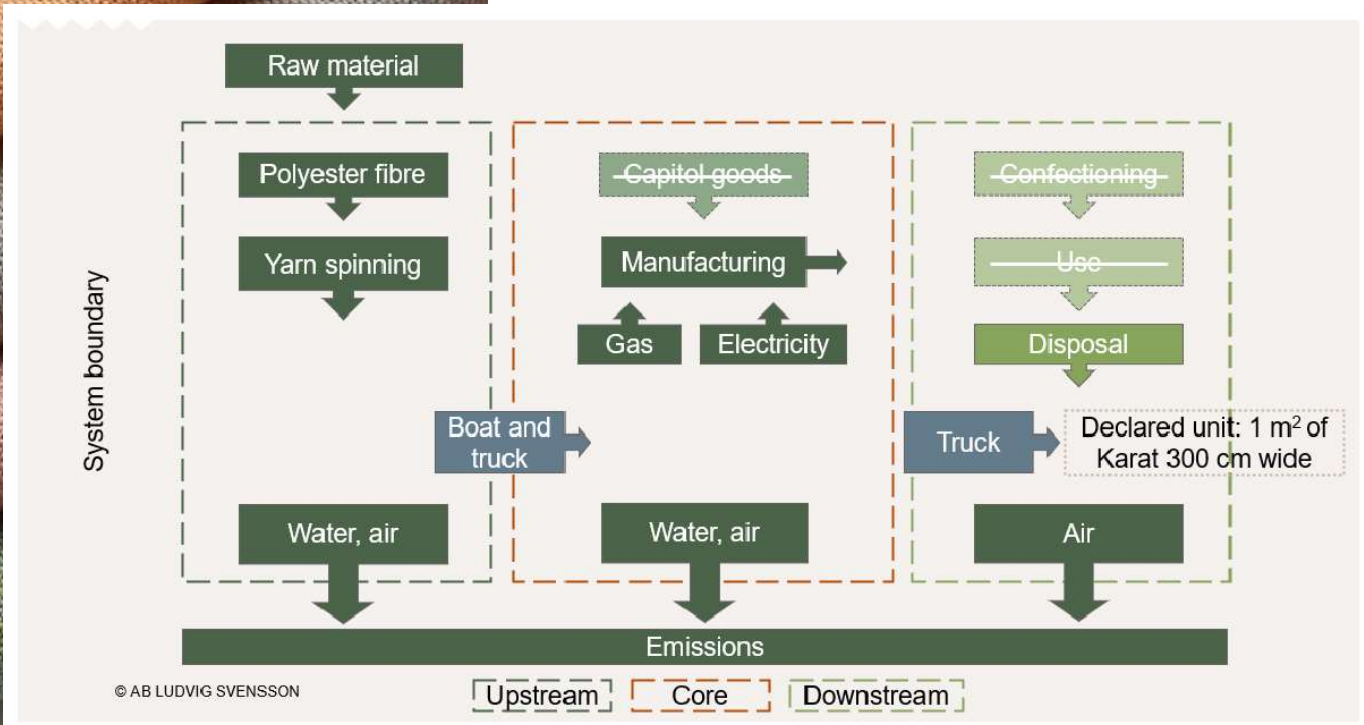
Which products have existing criterias?

Energy efficient products (europa.eu)



EPD: Karat RE AB Ludvig Svensson

www.environdec.com



svensson

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_2H_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

EU: Sustainable products initiative

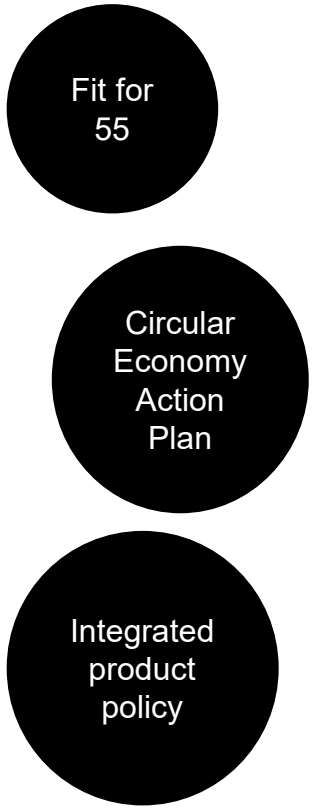
[The Sustainable Products Initiative] echoes the European Green Deal in pointing to the leading role that Europe's industry must play in this, by reducing its carbon and material footprint and embedding circularity across the economy, and underlines the need to move away from traditional models, and 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 bried introduction of CEAP see new_circular_economy_action_plan.pdf (europa.eu)



Material selection: rules of thumb

Green vs blue

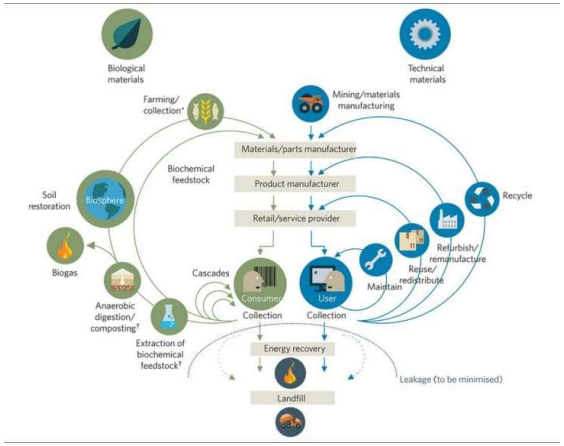
Waste from another process

Recycled material, in the loop vs down-cycled

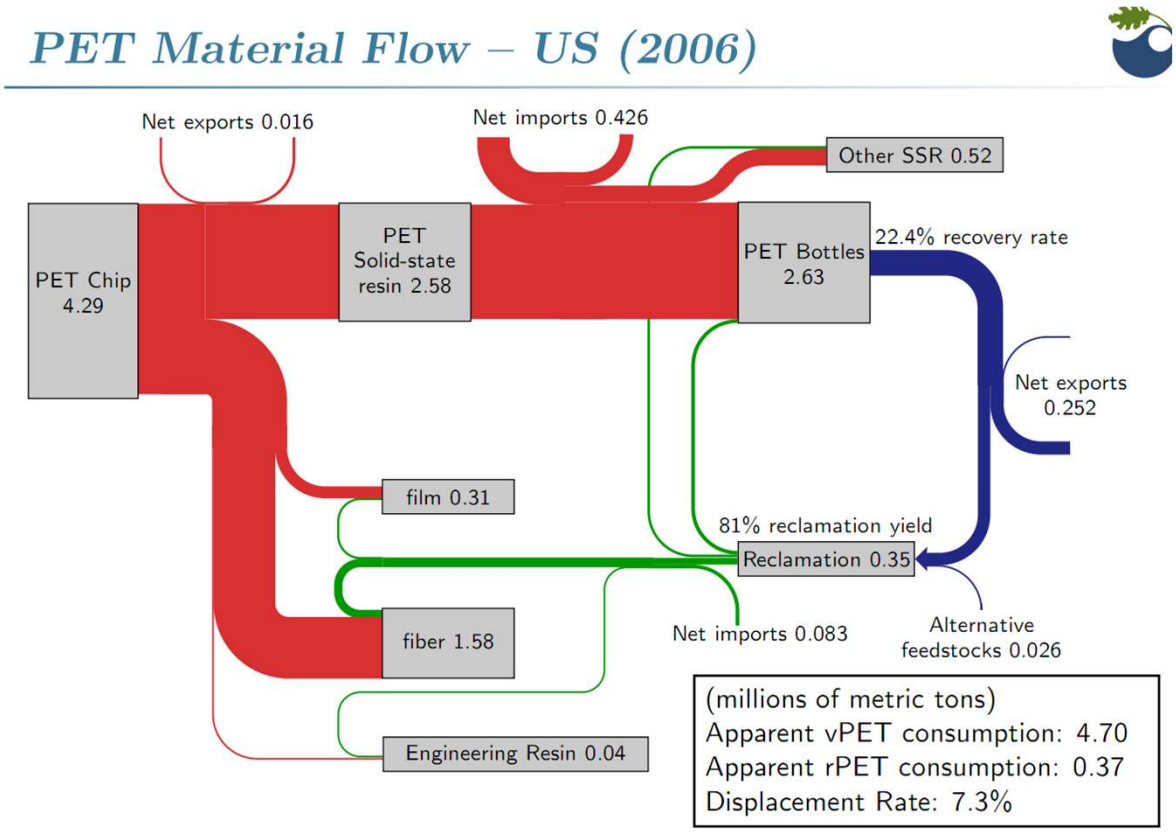
Recyclable

Non-toxic and safe

Biodegradable

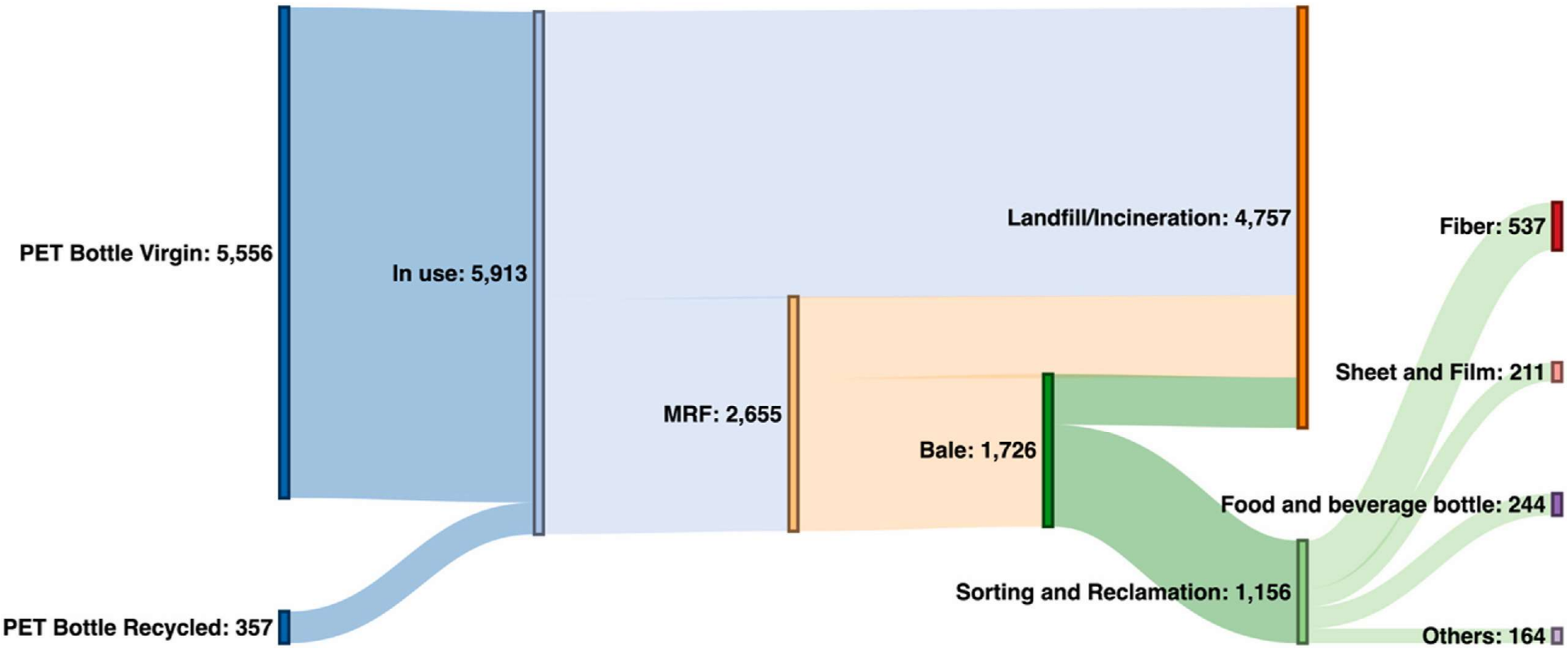


Material flow of single material:



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

US PET bottle m-pounds 2017

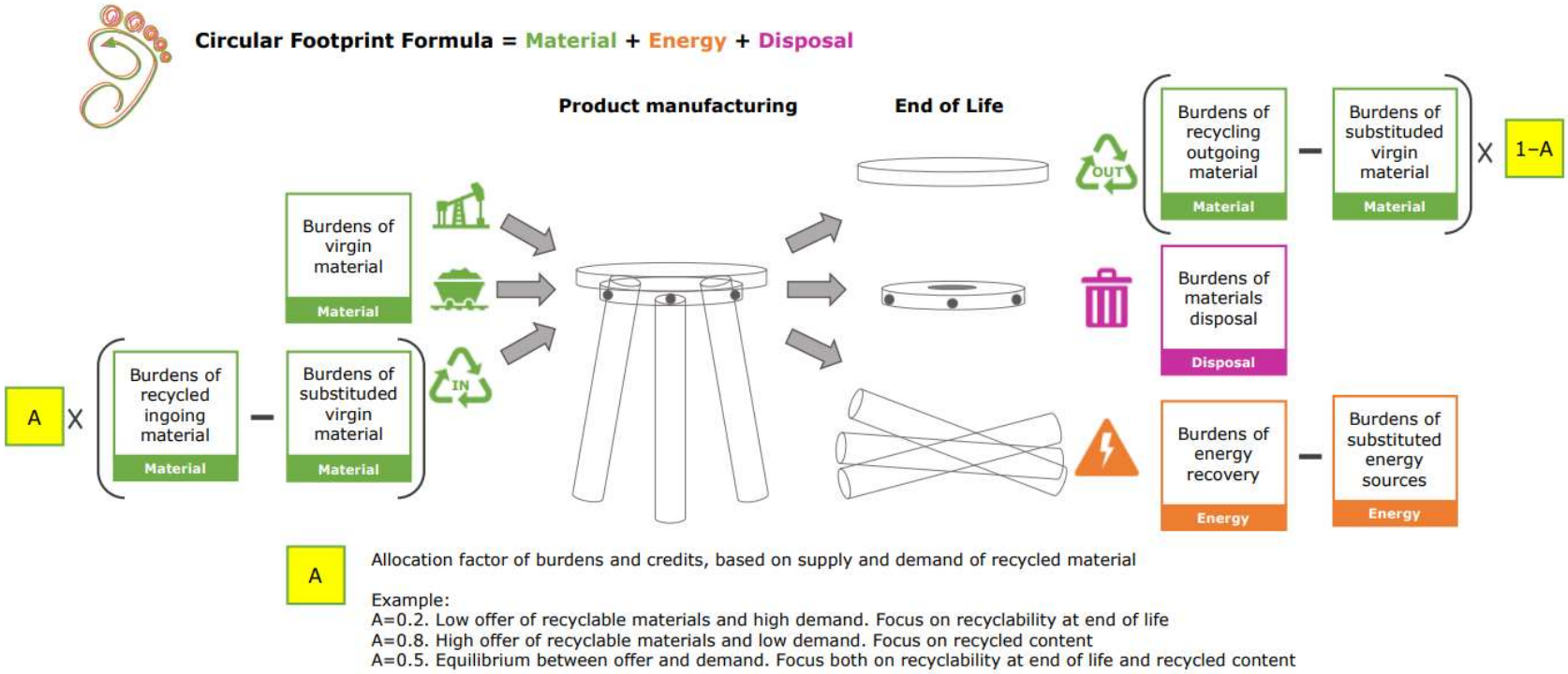


https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials,

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



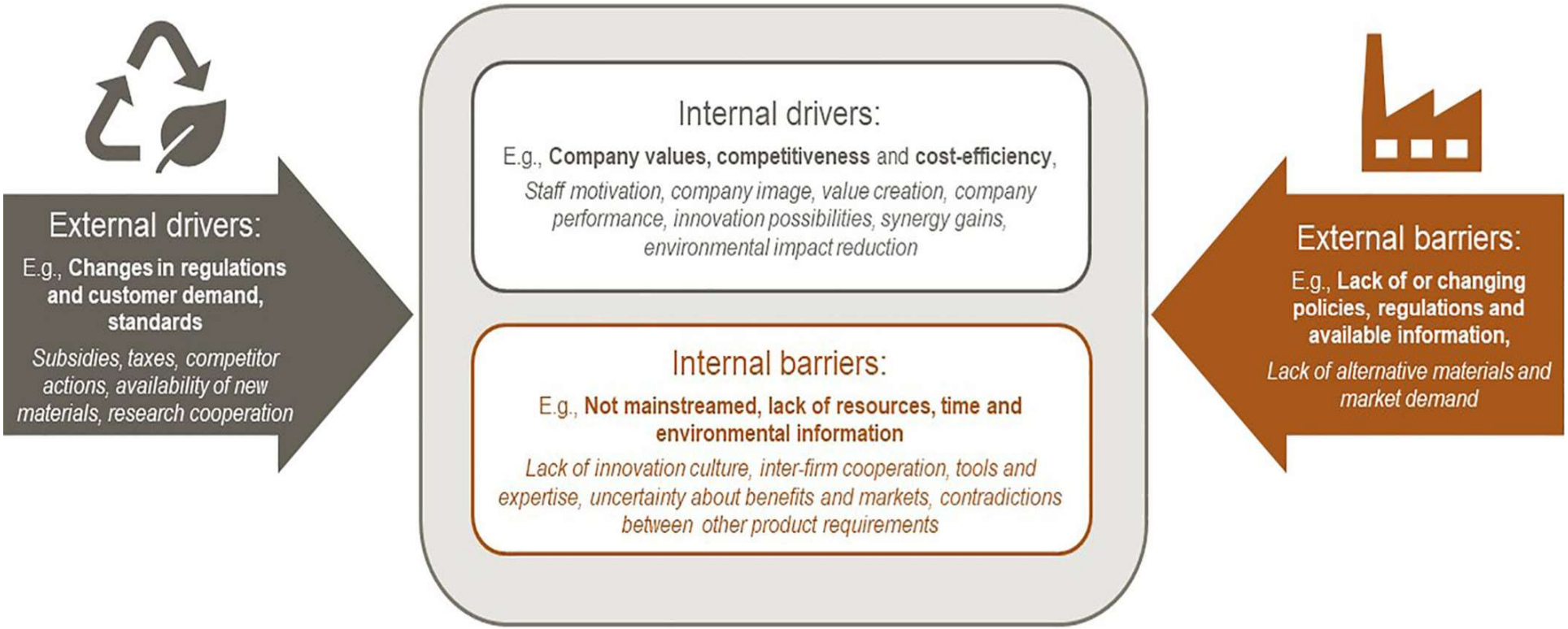
A — Allocation factor of burdens and credits, based on supply and demand of recycled material

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

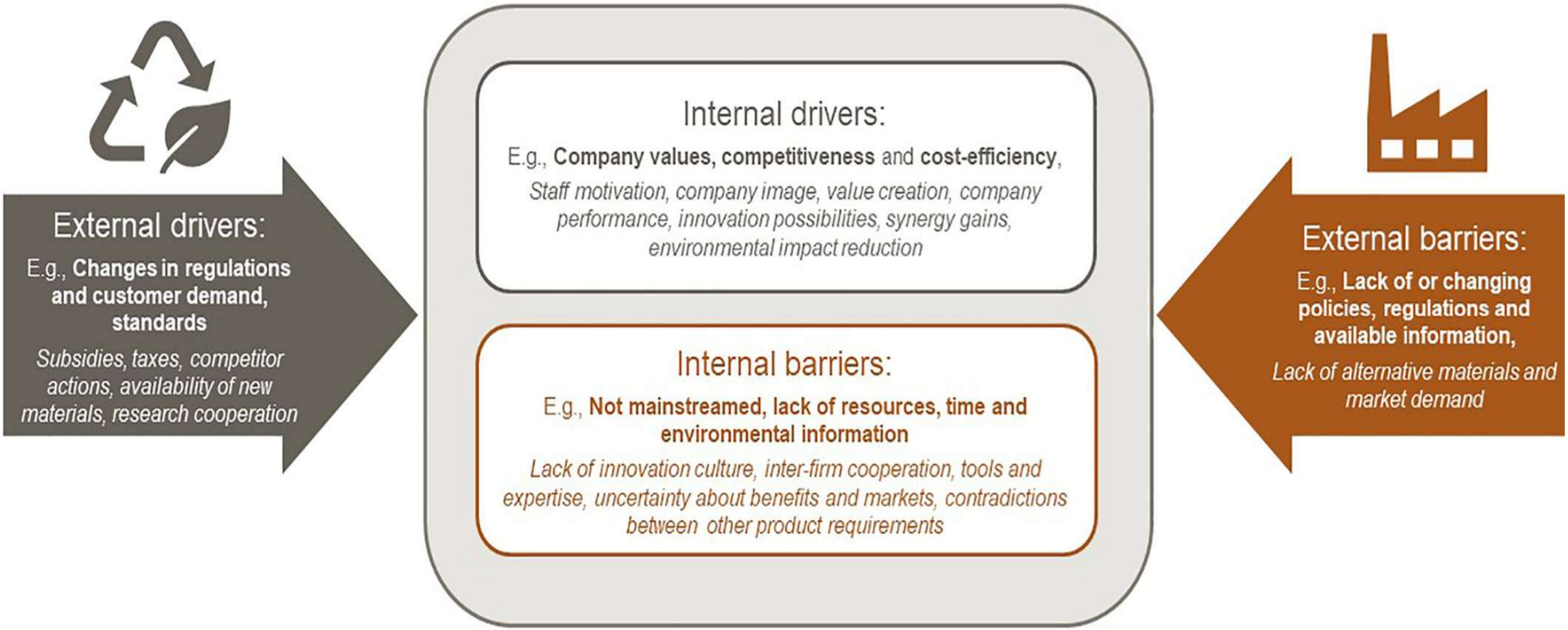
Is it appealing?

‘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.



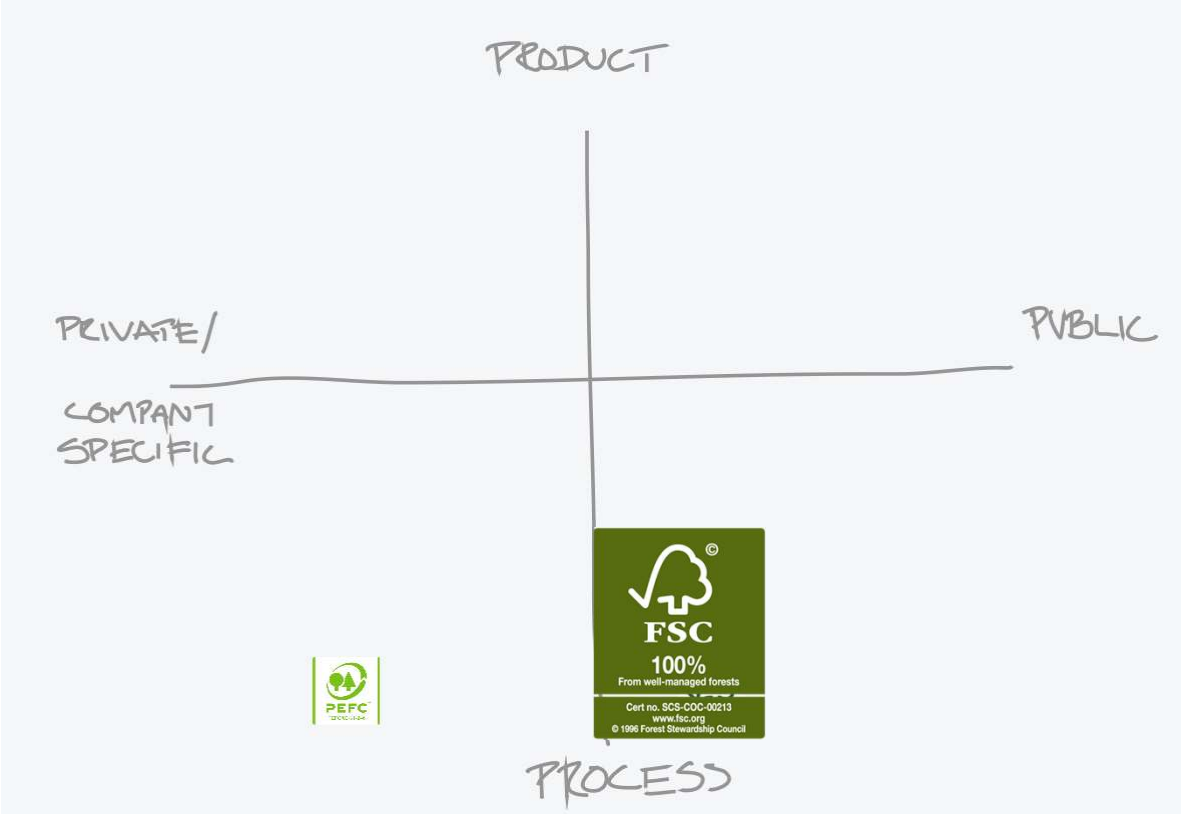
Most common drivers and barriers of ecodesign (Horn et al 2023)

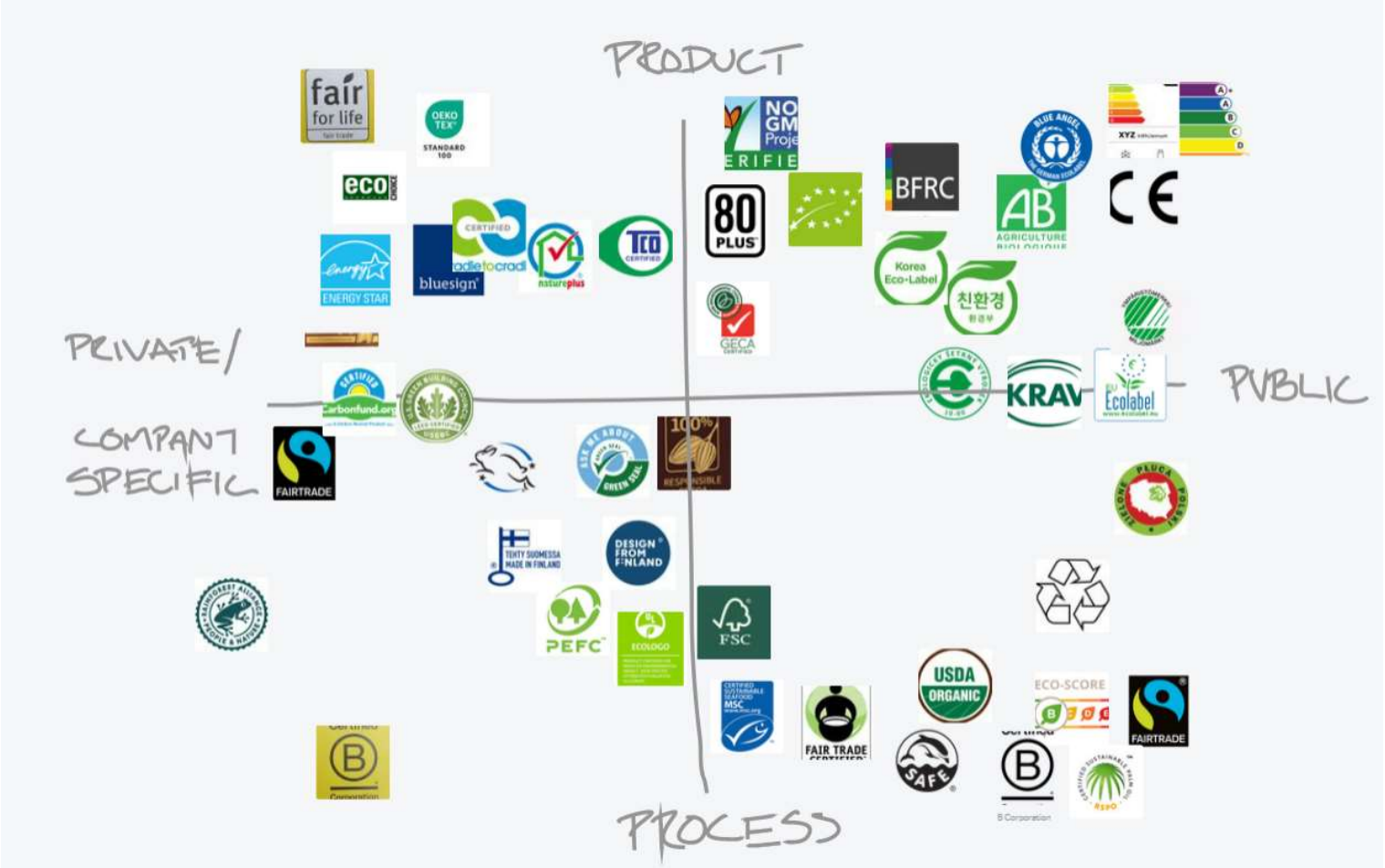


How can designers better engage with and promote eco-design?

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
fair for life
OEKO TEX STANDARD 100
eco
bluesign
ENERGY STAR
80 PLUS
BFRC
AB AGRICULTURE
Korea Eco-Label
친환경
GECA
KRAV
Ecolabel
FAIRTRADE
DESIGN FROM FINLAND
PEFC
FSC
USDA ORGANIC
ECO-SCORE
FAIR TRADE
SAFE

Next session: How does design speak?

Iconic – likeliness, metaphors

Indexical – traces of manufacture or origin

Symbolic – arbitrary, has to be learned

S.Vihma: Design reaches beyond proving affordable tools for people to do their job.
T. Keinonen: Design without aesthetics is simply bad engineering.
M. Jalas: Design makes the world around us understandable

Exercise: Select a product/service that communicates sustainability effectively and 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.