Hall 4A


Chillventa Specialist Forums 2024
Chillventa Fachforen 2024
CONNECTING EXPERTS.

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Chillventa 2024

PEFCR Ventilation units & fans

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Wouter van Kootwijk
M +31 6 29139668
E wouter.vankootwijk@ecomatters.nl
W Ecomatters.nl

EVIA
European Ventilation Industry Association

Agenda

- Introduction
- Life Cycle Assessment (LCA)
- Product Environmental Footprint (PEF) method
- PEF Category Rules (PEFCR)
- EVIA PEFCR project
- Representative products (RP)
- Scaling to a virtual RP
- System boundaries
- Preliminary results
- Main conclusions

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Sustainability reporting

- CSRD Reporting
- Double materiality assessment
- Scope 1, 2 & 3 calculations

Product footprint

- Life Cycle Assessment
- Environmental Product Declarations
- Product Environmental Footprint

Sustainability Regulation

- Green Claims (Directive)
- Eco-design legislation (ESPR)
- Single Use Plastics Directive

Approaches

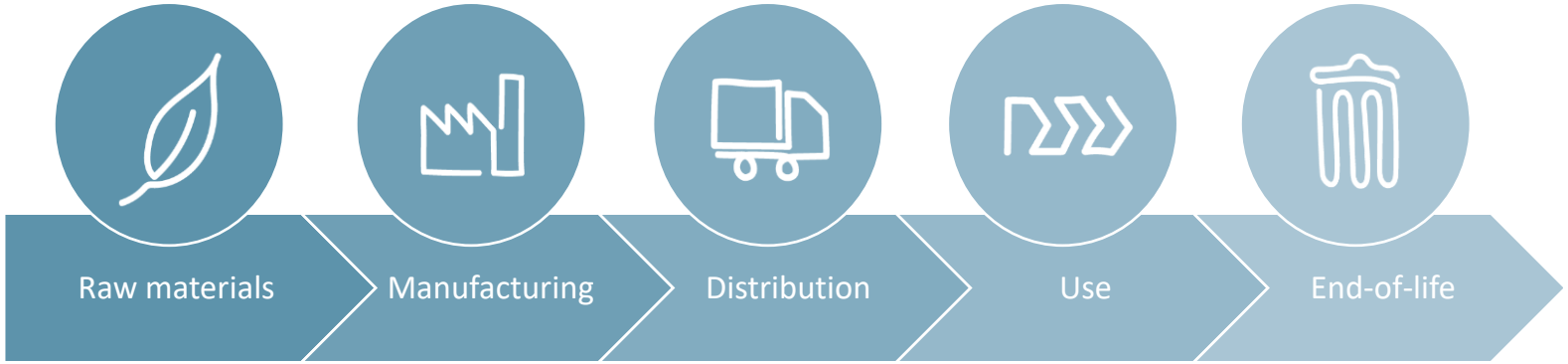
- Specific projects
- Extended team member
- Ad hoc support
- Development partner

Industries

- Chemicals & Coating
- Plastics & Packaging
- Manufacturing
- Construction & Building

Life Cycle Assessment (LCA)

- Method to calculate the **environmental performance** of a product or process over its **entire life cycle**
- Considers many environmental **impact categories**, not only global warming
- **Full value chain** in consideration: consecutive and interlinked stages of a product system
- From **material extraction** through **manufacturing**, **product use** and until the disposal at **end of life**



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Product Environmental Footprint (PEF)

What is PEF?

- The Product Environmental Footprint (PEF) is an **LCA methodology** to quantify the environmental impacts of products (goods or services).
- Main goal of the PEF is **harmonization** of LCA calculations across products, industries and geographies (Europe)
- Designed by the **EC Joint Research Centre** to enhance green products on the market
- Includes the calculation of total environmental impact in a **single score** , facilitating environmental labelling.

PEF and EU policy

- PEF is expected to be **integrated within various EU policy / regulation**, within next 5-10 years.
- Examples of policies or regulations with references to PEF, or life cycle information in general:
  - The Eco-design for Sustainable Products Regulation (ESPR) as part of the Sustainable Products Initiative (SPI) in the broader Circular Economy Action Plan (CEAP) 2.0
  - The Energy Performance of Buildings Directive (EPBD)
  - The Proposal for a Directive on substantiation and communication of explicit environmental claims (Green Claims Directive)

PEF: 16 impact categories

Climate change

Toxicity

Pollution & effects on nature

Resources

Impact categories PEF method	Unit
Climate Change - total	kg CO2 eq.
Human toxicity, cancer - total	CTUh
Human toxicity, non-cancer - total	CTUh
Ecotoxicity, freshwater - total	CTUe
Ozone depletion	kg CFC-11 eq.
Particulate matter	Disease incidences
Ionising radiation, human health	kBq U235 eq.
Photochemical ozone formation, human health	kg NMVOC eq.
Acidification	Mole of H+ eq.
Eutrophication, terrestrial	Mole of N eq.
Eutrophication, freshwater	kg P eq.
Eutrophication, marine	kg N eq.
Land Use	Pt.
Water use	m^3 world equiv.
Resource use, mineral and metals	kg Sb eq.
Resource use, fossils	MJ

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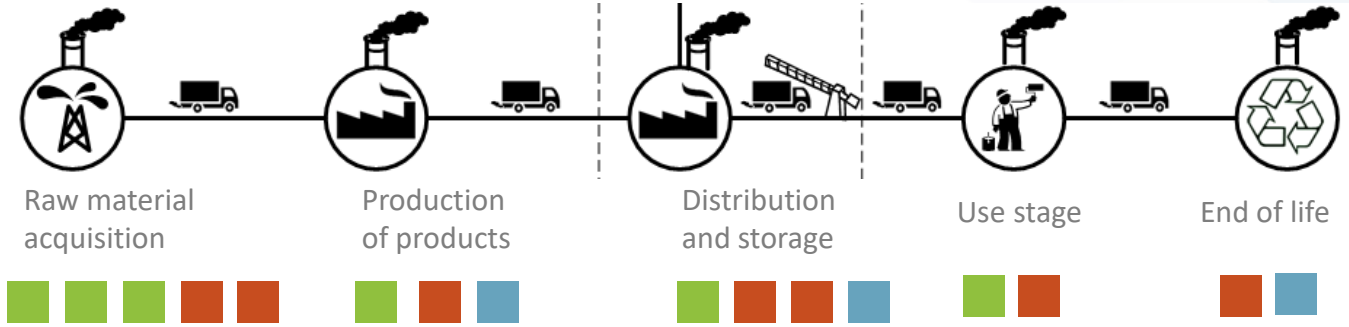
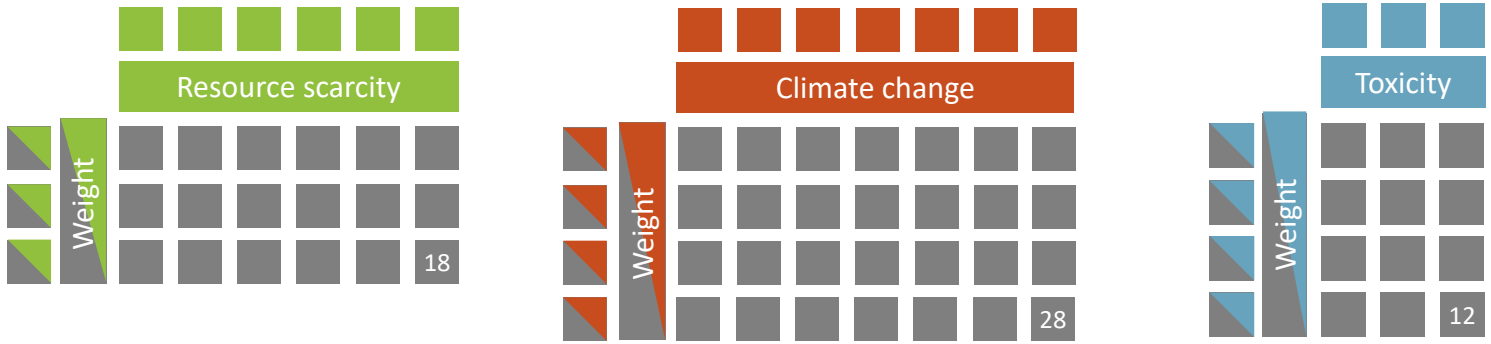
PEF: simplified

Step 1:
Value chain impact assessment

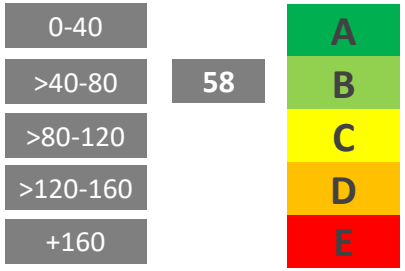


Step 2:
Weighting



Step 3:
Sum and communication

PEF (Footprint)



Final result

Improvement areas (illustrative):

- Climate change
- Raw material acquisition
- Use phase energy consumption

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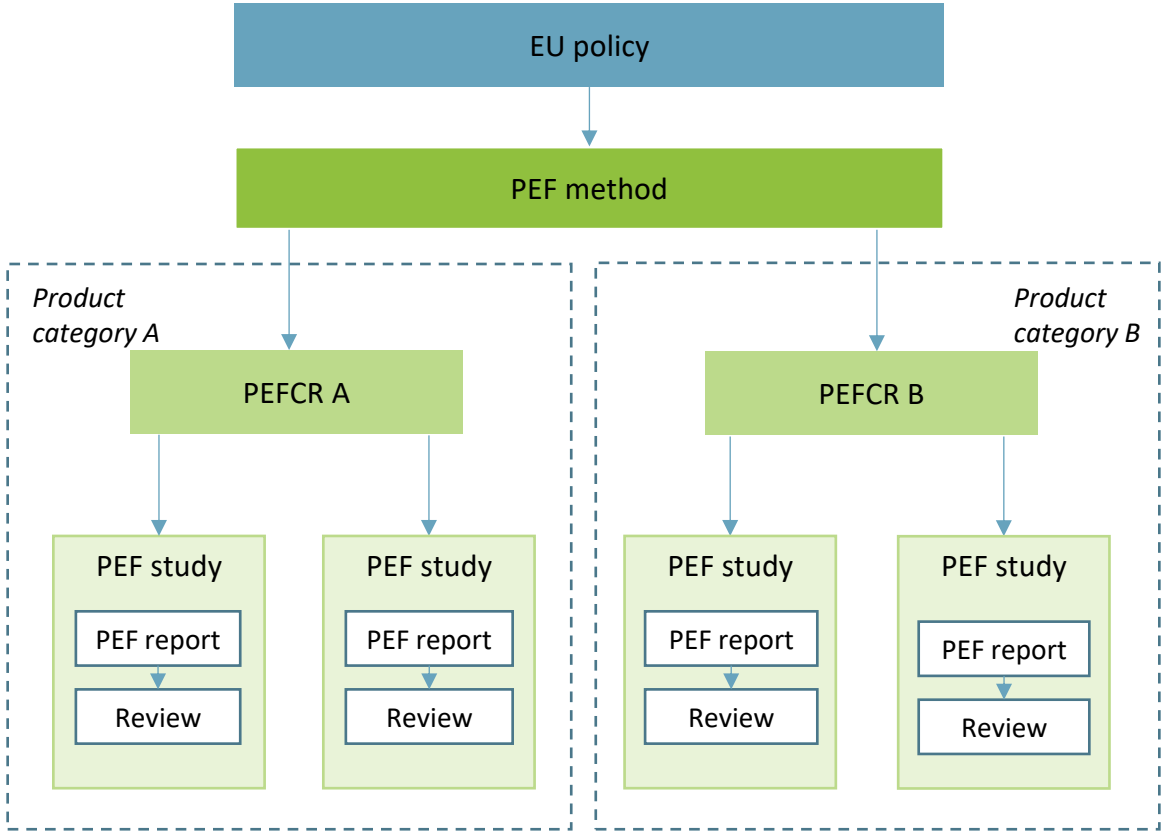
Product Environmental Footprint Category Rules (PEFCR)

- Category rules **(PEFCR's)** are developed (e.g., by industry associations) to **streamline** PEF studies for product groups

- A PEFCR is a rule-book document that includes:
    - Which functional unit to use
    - Which stages and processes to consider
    - What data needs to be collected
    - Which datasets to use
    - Predefined use scenarios
    - How to model waste treatment
    - Which impact assessment models to use
    - A benchmark based on a representative product (RP)
    - And more…



EVIA PEFCR project

EVIA commissioned Ecomatters to develop a **PEFCR for ventilation products**

Goal

To develop a PEFCR that promotes unified and **streamlined product sustainability assessment** by EVIA members
To **prepare the industry** for potential future regulations or policy developments.

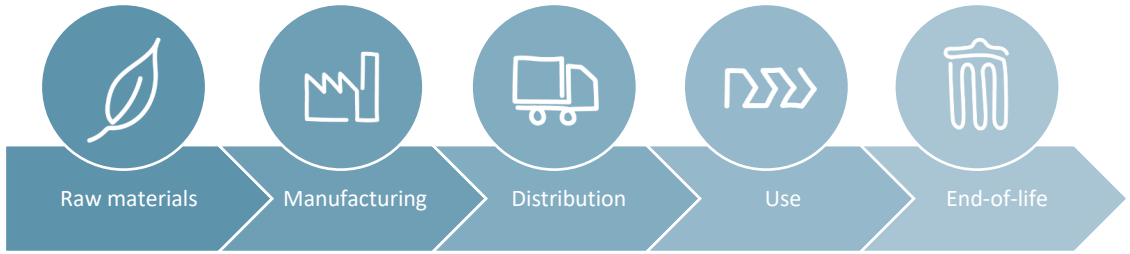
Scope

This project supports EVIA with a PEF-LCA calculation methodology for their ventilation products categorized in four subcategories:

1. **Bi-directional residential ventilation units (BRVU)**
2. **Unidirectional residential ventilation units (URVU)**
3. **Non-residential ventilation units (NRVU)**
4. **Fans >125 W**

Methodological aspects

- **Full life cycle**, including use stage & end-of-life
- Developed in **alignment the PEF method**
- Not officially part of the “EF transition phase” led by the EC
- Not aiming for 100% PEF compliance



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Functional unit

- Products are made to deliver a certain function to society.
- In LCA this function is defined as the functional unit.
- The functional unit is needed to compare impacts of varying products on a fair basis.

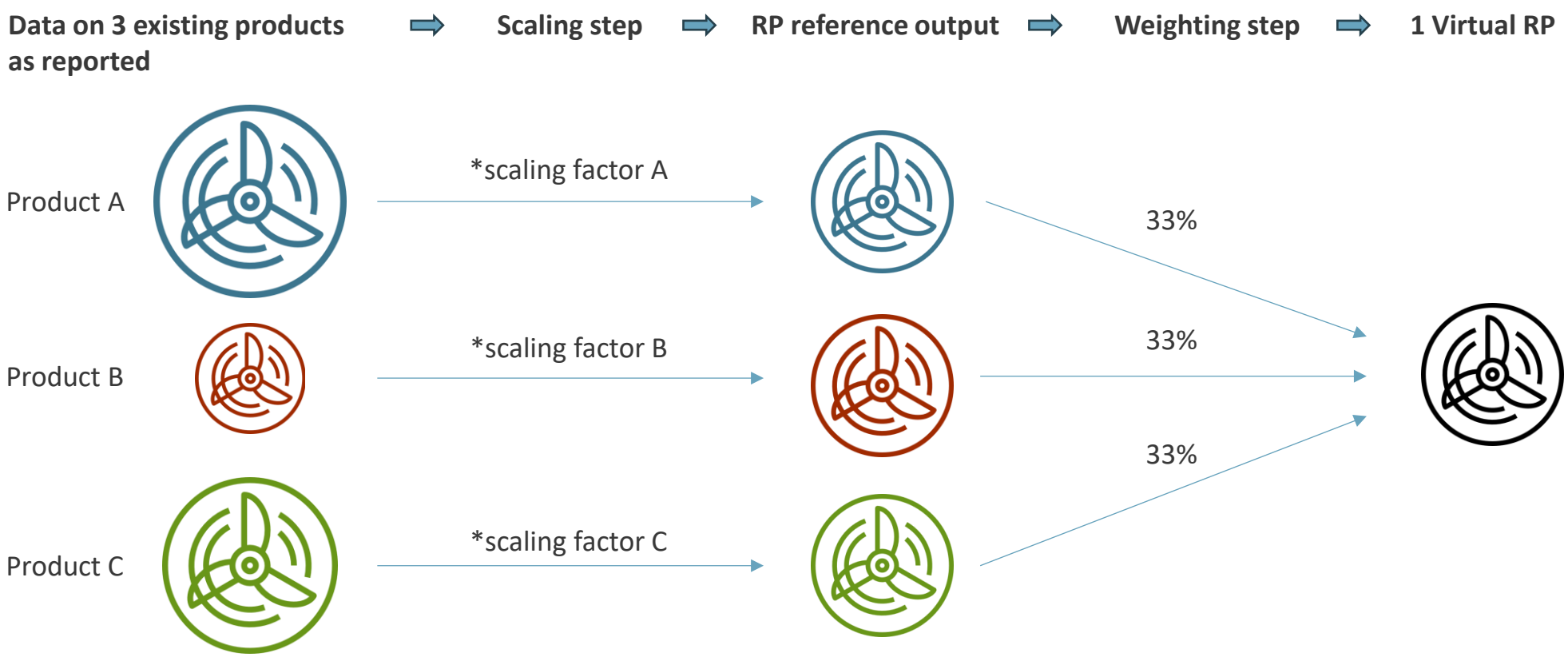
	Fans	BRVU	URVU	NRVU
What?	Provide air power	Replace utilized air in a building by outdoor air		
How much?	1 W	1 m3/h		
How well?	at standard air conditions (20 °C) and 101325 Pa	at standard air conditions (20 °C) and 101325 Pa		
How long?	over the reference lifetime of 50 years	over the reference building lifetime of 50 years		
Functional unit	Provide 1 W of air power at standard air conditions, over the reference lifetime of 50 years.	Replace 1 m3/h of utilized air in a building by outdoor air at standard air conditions, over the reference building lifetime of 50 years.		

Representative Product (RP)

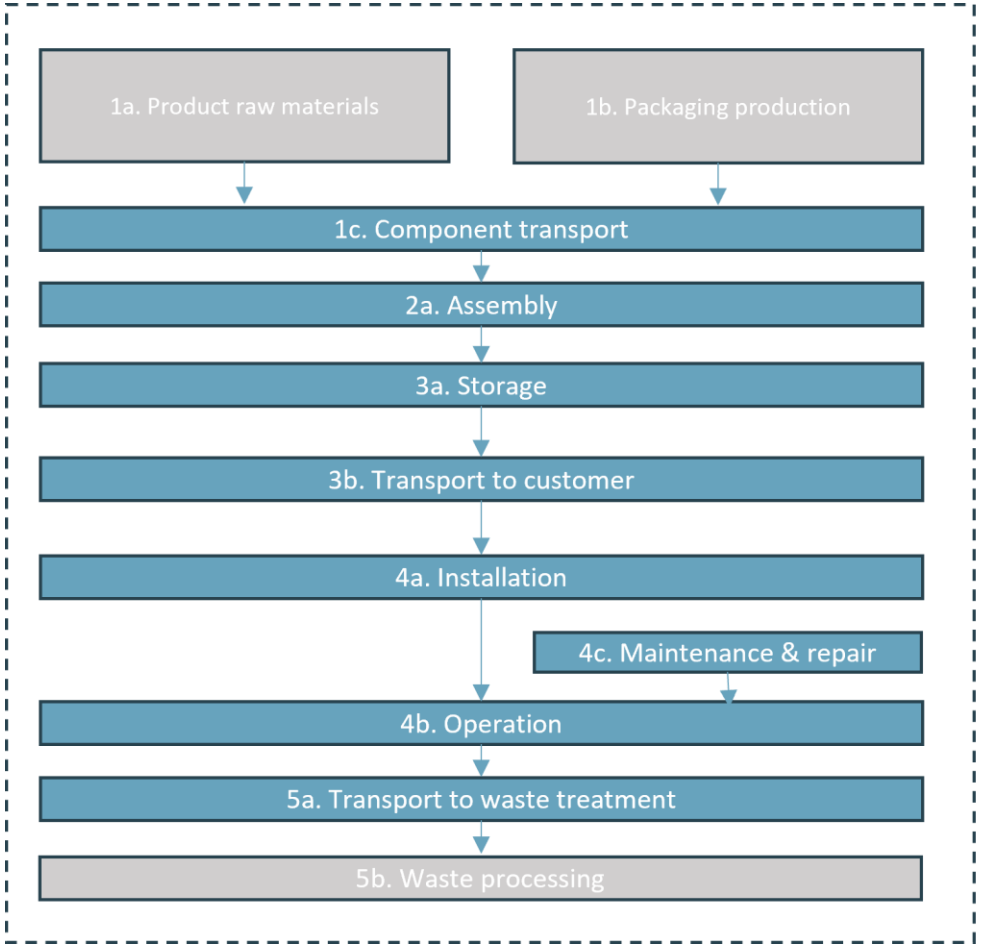
Subgroup	Type	Typical product	Function	Other characteristics	Reference output
1. URVU	Unidirectional	Centralised unit	Ventilation	-	250 m3/hr reference (max 400 m3/hr) 50 pascal reference (max 100)
2. BRVU	Bidirectional	Centralised unit	Ventilation	defroster bypass heat recovery	250 m3/hr reference (max 400 m3/hr) 50 pascal reference (max 100)
3. NRVU	Bidirectional	Centralised unit	Ventilation	heat recovery	10.000 m3/hr and with 2.6 kW airpower
4. Fans (>125W)	-	Fan	Air transfer	backward curving centrifugal no housing	Airpower(P_u): 4,5 kW

Virtual RP composition

For each subgroup, the RP is a virtual product, based on a mix of 3 existing products scaled to the RP characteristics.



System boundaries



1. Raw material acquisition and pre-processing

2. Manufacturing

3. Distribution

4. Use

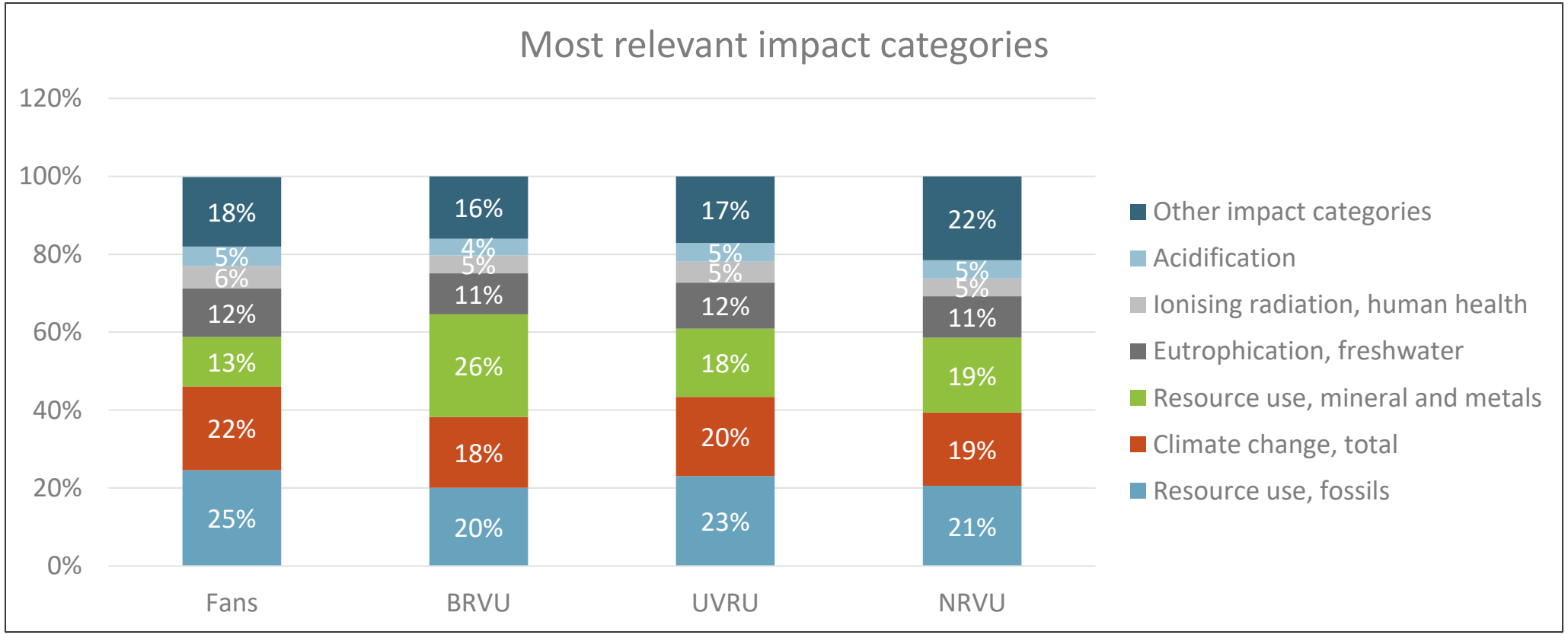
5. End of life

In scope:
Company specific data required

In scope:
Default & background data

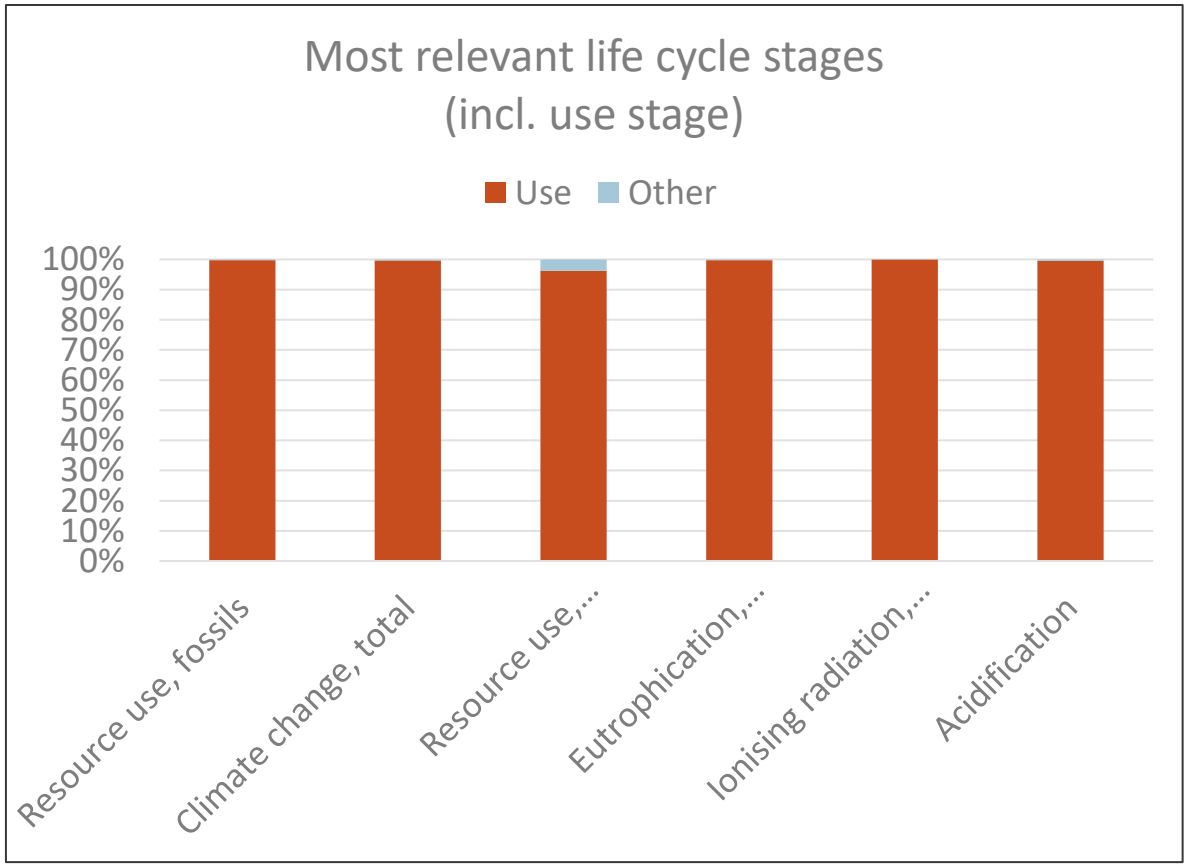
Preliminary: Most relevant impact categories

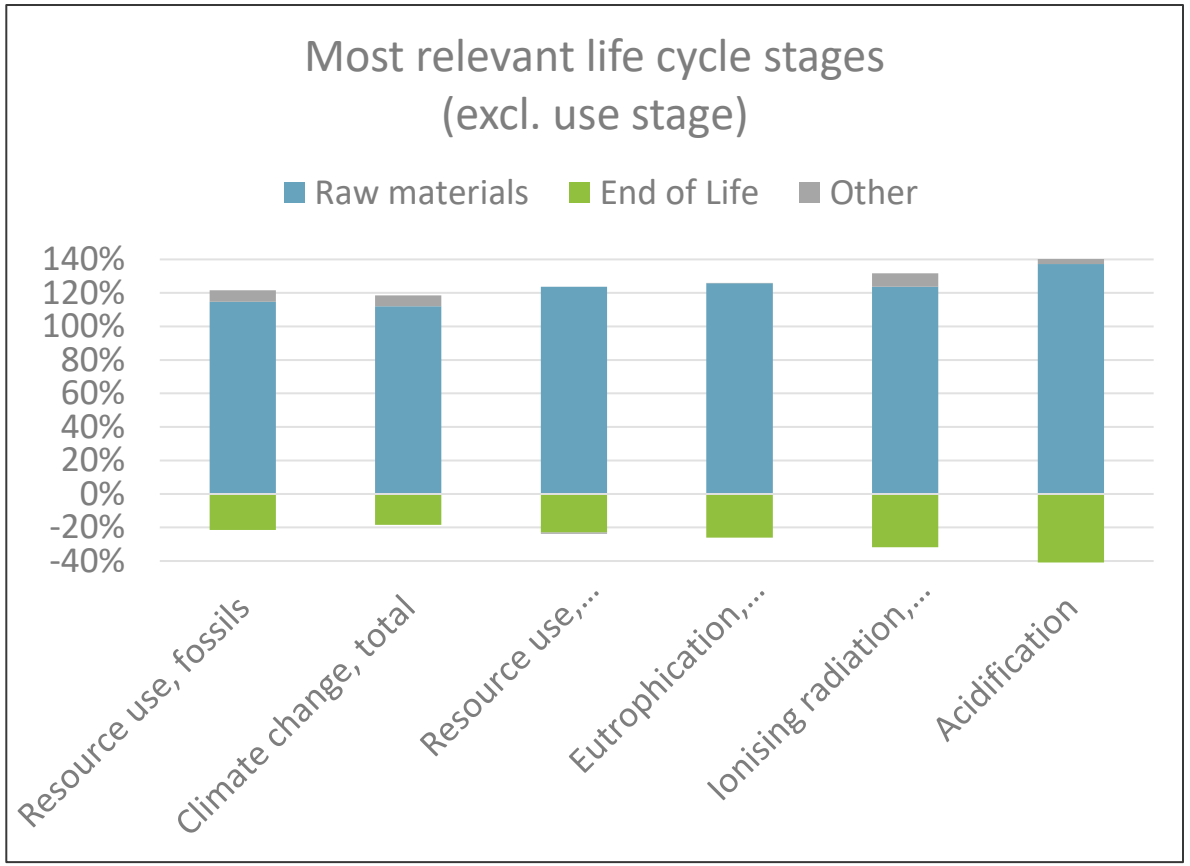
The most relevant impact categories that cumulatively contribute to at least 80% of total environmental impact single score.



Preliminary: Fans, most relevant life cycle stages

- The most relevant impact stages cumulatively contribute to at least 80% of total environmental impact of the most relevant impact category.
- The use stage contributes more than 50% so the most relevant stages also have to be identified excluding the use stage





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Main conclusions

- Climate change and fossil resource use are important impact categories, but other impacts should not be overlooked
- Use stage (electricity consumption) is the dominant stage in the life cycle: accurate scenarios, parameters and assumptions are key
- When excluding the use phase, raw materials are the main source of impact -> links to Eco-design (ESPR)
- PEFCR harmonises LCA studies for products in the same product category and the RP may serve as a benchmark

Contact details

Wouter van Kootwijk
M +31 (0)6-29139668
E wouter.vankootwijk@ecomatters.nl
W www.ecomatters.nl

EVIA Secretariat
E secretariat@evia.eu
W www.evia.eu

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