Introduction to the Product Environmental Footprint (PEF)

Kiwa Sustainability Academy Webinar

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Anastasiia Huk & Niklas van Dijk

Presenters

Anastasiia Huk

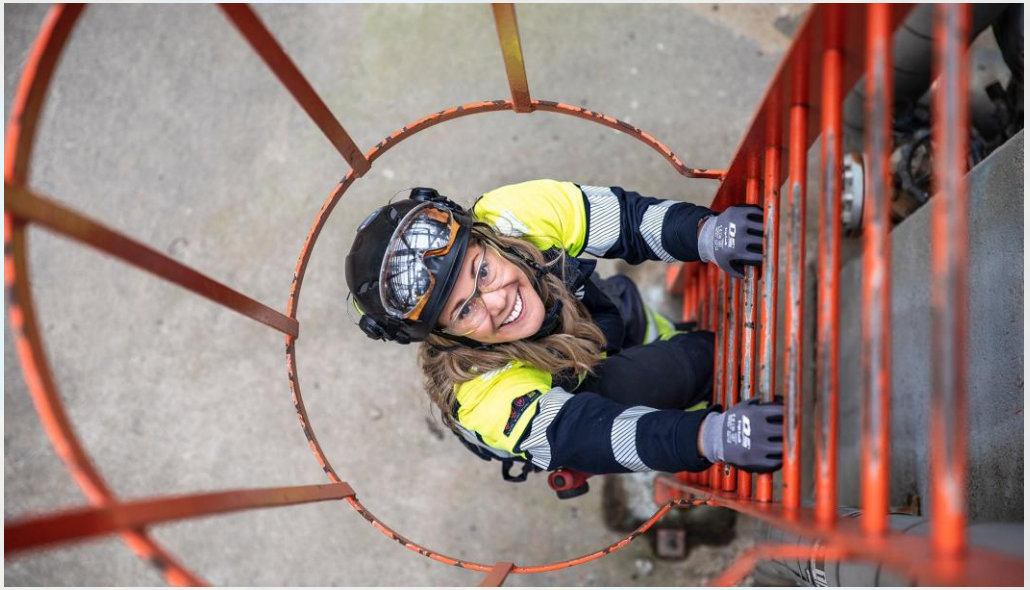
Environmental Engineer &
Verification / Validation Kiwa-Ecobility Experts

Niklas van Dijk

Senior Environmental Engineer &
Team Lead LCA/EPD General

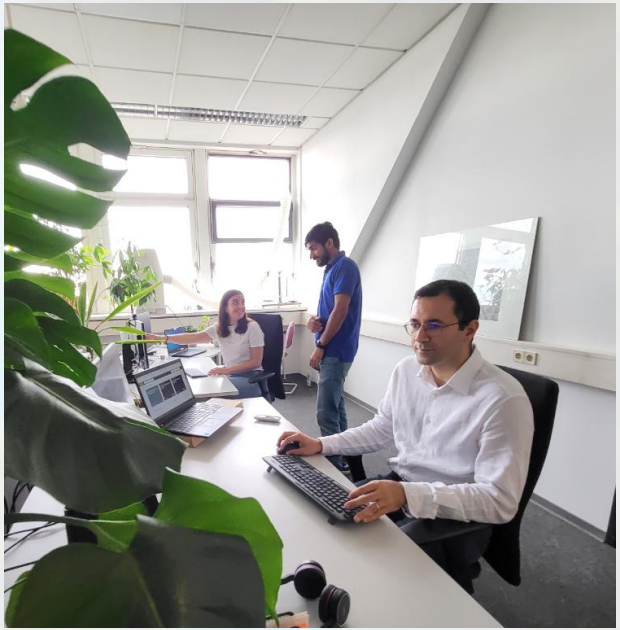
Kiwa

- **Global TIC company** providing testing, inspection, certification, consultancy and training services
- **Experience across various markets**, including built environment, (cyber) security, renewable energy, water and health care as well as food, feed & farm
- **Founded in the Netherlands in 1948** and the headquarter is based in Rijswijk
- Over **12,000 employees** operate across a global network of more than **200 office and advanced testing laboratory locations** in more than **50 countries**



Kiwa Ecobility Experts

- **Large, international sustainability team of experts** from different fields (environmental / mechanical / chemical / energy / civil engineering etc.) located in Berlin in Germany
- Focuses on the following topics:
  - **Sustainability metrics:** Calculation and verification of environmental / social impacts of products, organizations or services
  - **Circular economy:** Verification and certification of systems to reuse, refurbish or recycle products
  - **Sustainability due diligence:** Verification and certification of environmental / social impacts along the supply chain
- **Independent verification / validation body** received a positive recommendation from DAkkS regarding ISO/IEC 17029 for the EU CPR on environmental sustainability to become a notified body



Product Environmental Footprint (PEF)

- provides harmonised rules to quantify and communicate environmental impacts of products, including goods and services
- method is based on LCA in accordance with ISO 14040/44
- focuses on reducing impacts throughout the supply chain of products — from raw material extraction to waste management
- provides specific requirements for modelling material flows, emissions, and waste streams, enabling a thorough understanding and management of environmental impacts
- aims to increasing confidence as well as reducing the effort and costs for businesses

History

- **2008 – 2010:** Analysis of existing environmental labeling schemes and LCA methods as well as the European Council calls for a harmonized approach
- **2011 – 2012:** The European Commission's Joint Research Centre (JRC) develops the initial technical guidelines for measuring the environmental footprint

- **2013:** Publication of Recommendation 2013/179/EU, formally introducing the PEF Guide
- **2013 – 2018:** Testing of the methodology across 27 different product categories and development of the first PEFCRs to ensure industry-specific comparability
- **2019 – Present:** Ongoing refinement of the methodology and data requirements as well as introduction of new PEFCRs
- **2021:** Adoption of Recommendation (EU) 2021/2279, replacing the 2013 version with updated technical requirements
- **2023 – Future:** Incorporation of PEF into major EU policies like the Ecodesign for Sustainable Products Regulation (ESPR) and the Green Claims Directive

Benefits

Compliance: helps companies position themselves in the context of legislative initiatives as the Green Claims Directive

Transparency: results can be used to inform consumers and customers about the environmental performance of your service

Harmonisation: increases consistency and comparability in the industry

Credibility: science-based, standardised framework

Steps

1. **Goal and Scope Definition:** Define the purpose, target audience, functional unit, and system boundaries
2. **PEFCR Review:** Check for existing Product Environmental Footprint Category
3. **Life Cycle Inventory (LCI):** Gather data on all inputs and outputs for each stage of the product's life cycle.
4. **Life Cycle Impact Assessment (LCIA):** Calculate environmental impacts using standardized categories
5. **Interpretation and Modelling:** Analyze the results to identify environmental "hotspots”
6. **Documentation and Reporting**

PEF Category Rules (PEFCR)

- drafted, managed and updated by the Technical Secretariat, the PEFCRs aim to support, simplify and reduce costs in PEF studies
- can be further developed to improve the reproducibility, comparability, and verifiability of results for specific product groups or sectors
- have to be updated to reflect market developments, new data and methodological developments
- more PEFCRs are developed by private initiatives independently from the Commission

Published:

Apparel & Footwear

Cut Flowers & Potted Plants

Synthetic Turf

PEF Category Rules (PEFCR)

In development:

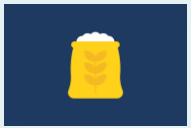
Aviation, Drones & eVTOLs

Marine Fish

Space

Tourism

In revision:



Feed for Food-Producing animals

Batteries & Accumulators

Beer

Pasta

Pet Food

Dairy Products

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Scope


Packaging
& Distribution
Use &
Maintenance
Manufacturing
Disposal
Resources
Emmissions
Processing
Waste
Natural Resources
& Raw Materials
Extraction
Recyling
& Recovery

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EoL – Circular Footprint Formula

Material

$$(1-R_1)E_V + R_1 \times \left(AE_{recycled} + (1-A)E_V \times \frac{Q_{Sin}}{Q_P}\right) + (1-A)R_2 \times \left(E_{recyclingEoL} - E_V^* \times \frac{Q_{Sout}}{Q_P}\right)$$

Energy

$$(1-B)R_3 \times (E_{ER} - LHV \times X_{ER,heat} \times E_{SE,heat} - LHV \times X_{ER,elec} \times E_{SE,elec})$$

Disposal

$$(1-R_2-R_3) \times E_D$$

CCF Formula

- In PEF, EoL is modelled with **the Circular Footprint Formula**
- The CFF consists of 3 parts: **material, energy recovery, and disposal**
- It describes **how environmental impacts and credits are shared** between recycled content, recycling at end of life, energy recovery, and waste disposal

Impact categories

- Climate change
- Ozone depletion
- Human toxicity, cancer
- Human toxicity, non-cancer
- Particulate matter
- Ionizing radiation, human health
- Photochemical ozone formation, human health
- Acidification
- Eutrophication, terrestrial
- Eutrophication, freshwater
- Eutrophication, marine
- Ecotoxicity, freshwater
- Land use
- Water use
- Resource use, minerals and metals
- Resource use, fossils

Results

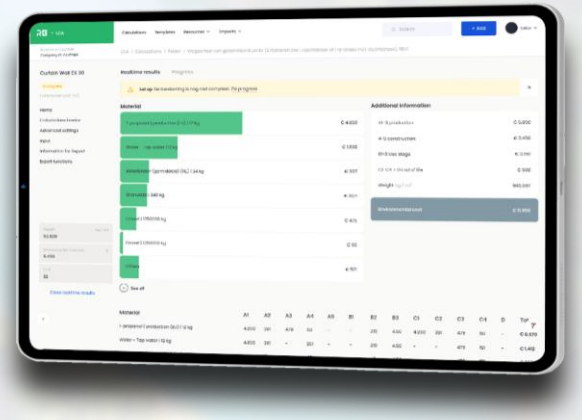
- PEF calculation is currently **based on EF 3.1**
- EF 3.1 refers to **version 3.1 of the Environmental Footprint method** used to assess environmental impacts
- **A separate result is calculated** for each environmental impact category
- The results are then **normalised and weighted** using the official EF 3.1 factors

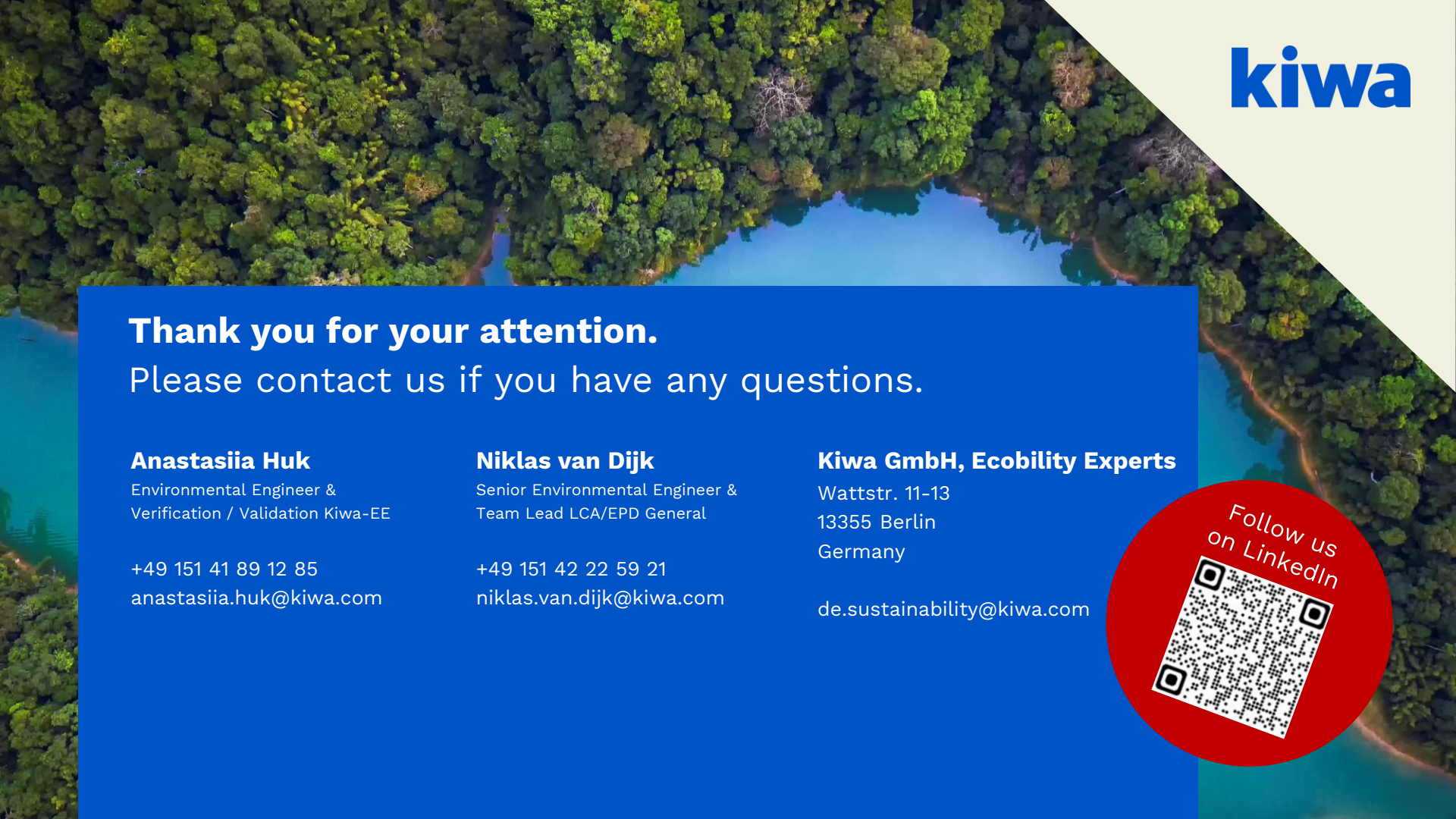
Abbreviation	Unit	Charachterised	Normilised	Weighted
AP	mol H^+ eqv.	7,06E-03	1,27E-04	7,88E-06
Climate change	kg CO_2 eqv.	1,72E+00	2,28E-04	4,80E-05
ETP-fw	CTUe	5,95E+01	1,05E-03	2,01E-05
PM	disease incidence	7,67E-08	1,29E-04	1,15E-05
EP-m	kg N eqv.	1,23E-03	6,29E-05	1,86E-06
EP-fw	kg P eqv.	3,13E-05	1,95E-05	5,45E-07
EP-T	mol N eqv.	1,27E-02	7,19E-05	2,67E-06
HTP-c	CTUh	1,29E-09	7,48E-05	1,59E-06
HTP-nc	CTUh	2,25E-08	1,75E-04	3,22E-06
IR	kBq U235 eq.	8,69E-02	2,06E-05	1,03E-06
SQP	Pt	2,92E+00	3,56E-06	2,83E-07
ODP	kg CFC 11 eqv.	1,47E-07	2,81E-06	1,77E-07
POCP	kg NMVOC eqv	5,11E-03	1,25E-04	5,98E-06
ADP-f	MJ	5,72E+01	8,80E-04	7,32E-05
ADP-mm	kg Sb-eqv.	3,94E-06	6,19E-05	4,68E-06
WDP	m^3 world eqv.	3,47E+00	3,03E-04	2,57E-05

Source: Kiwa EE PEF results

Kiwa‘s services

- PEF calculations by Kiwa GmbH, Ecobility Experts
- PEF verification / validation independently via Kiwa-Ecobility Experts
- PEF calculation tool „Kiwa R<THINK“
  - online tool developed by Kiwa
  - hosted on secure servers in Europe
  - product level: PEF according to EU Guidance, LCA according to ISO 14040/14044, EPD according to EN 15804/50693 etc.
  - organisational level: CCF according to ISO 14064/GHG Protocol





Thank you for your attention.

Please contact us if you have any questions.

Anastasiia Huk
Environmental Engineer &
Verification / Validation Kiwa-EE

+49 151 41 89 12 85
anastasiia.huk@kiwa.com

Niklas van Dijk
Senior Environmental Engineer &
Team Lead LCA/EPD General

+49 151 42 22 59 21
niklas.van.dijk@kiwa.com

Kiwa GmbH, Ecobility Experts
Wattstr. 11-13
13355 Berlin
Germany

de.sustainability@kiwa.com

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