

VTT TECHNICAL RESEARCH CENTRE OF FINLAND LTD



Primary challenges – Testing and use of the LCA toolbox



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PEF & PEFCR vs ISO standards

- PEF is a more concrete detailed manual for calculation but also more demanding and time consuming, higher data requirements
 - E.g. nomenclature according to ILCD format
- PEF guide states that:
 - No expertise in Environmental assessment methods is needed to use this guide for conducting a PEF study? ->
 - The guide is made for LCA experts, not even for a company sustainability manager without severe knowhow.
 - That industrial associations should provide simplified calculation tools and expertise to help SMEs conduct calculations according to PEF method
 - Has there been any simplified approaches e.g. included in PEFCRs?

PEFCRs + saves time and makes the results comparable

- Defining relevant impact categories
- Appropriate system boundaries
- Identifying key parameters and life cycle stages
- Guidance on data sources
- RUaEP – details on how to complete this
- Multifunctionality, rules for handling this for specific processes and e.g. recycling

What is important - data

- When data gaps exist – list of sources or data on generic substitutes
- When the data is not covering some impact categories, list generic figures and state which categories usually are not covered
- The core process data has to be collected from the producer directly (not database generic data)
 - This data is not in a format that is compatible with the impact assessment methods. E.g. Environmental fact sheets filled in by companies.

What is challenging- data formats

- Software requirements are on high level
- Turning the non elementary flows to elementary flows. Guidance on this, and examples
 - ILCD nomenclature
- A lot of resources go to data compatibility challenges. Software import and export and uniform data formats make it challenging to work with different software and databases.
- **How shall SMEs have the resources for all of this? ->**
 - Some minimum requirements for companies of different sizes, “light” PEFs.

PEFCR example - Intermediate paper products

- Multi functionality and allocation is a very important issue and needs still clarification -> supporting studies.
 - If excess energy at mill is produced, what energy (emission profile) should it substitute
 - When is mass based allocation ok, when is economic ok. Clear rules!
- PEF recycling formula and possible other optional methods?
 - How to use these and generic data to be applied included in PEFCR
 - Data on 100% virgin pulp types can be demanding to gather

Data used in calculation

$$\left(1 - \frac{R_1}{2}\right) \times E_V + \frac{R_1}{2} \times E_{recycled} + \frac{R_2}{2} \times \left(E_{recyclingEoL} - E^*_V \times \frac{Q_S}{Q_P}\right) + R_3 \times (E_{ER} - LHV \times X_{ER,heat} \times E_{SE,heat} - LHV \times X_{ER,elec} \times E_{SE,elec}) + \left(1 - \frac{R_2}{2} - R_3\right) E_D - \frac{R_1}{2} \times E^*_D$$

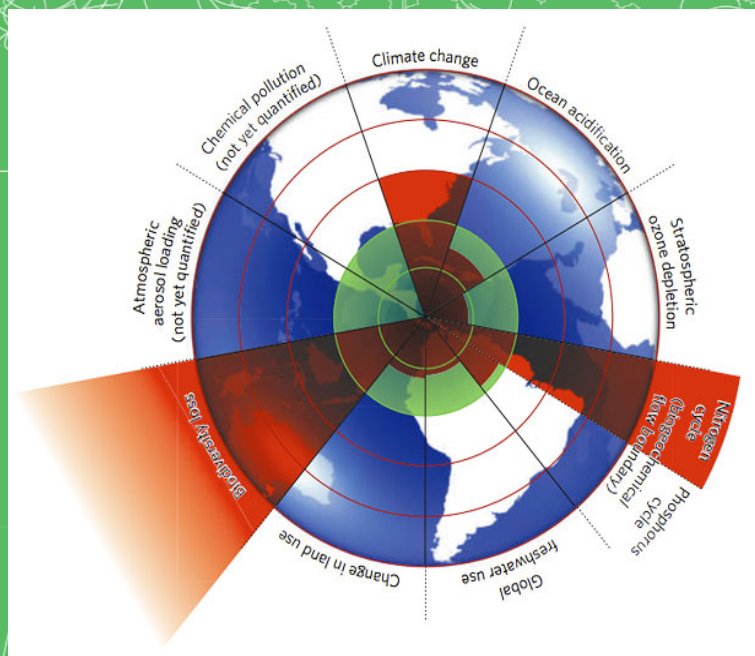
E_V	$E_{rec,in}$	$E_{rec,eol}$	E^*_V	Quality difference	E_{er}	LHV	$E_{se,heat}$	$E_{se,elec}$	$X_{r,heat}$	$X_{r,elec}$	$E_{er,avoided}$	E_D	E^*_D
Emissions from primary material production	Emissions from recycling process in previous product system	Emissions from recycling process in the studied product system	Emissions from producing virgin materials that are being replaced by recycled materials	dimensionless ratio taken as an approximation for any differences in quality between the secondary material and the primary material	Emissions from energy recovery process	heating value [GJ/t]	Emissions that would have occurred when heat was produced with substituted energy source - emission factor for an average OECD Europe heat [kg/GJ]	Emissions that would have occurred when electricity was produced with substituted energy source - Emission factor for an average OECD Europe electricity [kg /GJ]	efficiency of heat recovery	efficiency of electricity recovery	Substituted energy production emissions	Emissions from waste disposal	Emissions from waste disposal from the product recycled material is taken from
600	423	423	600	0,25	9	18,5	82	100	0,8	0,4	160	500	500

Data is sourced from the Reffibre case study, SCA calculation tool and LEADER research study (VTT 2010).

PEFCR example - Intermediate paper products

- Cumulative energy demand
 - Guidance on how to take into account the data from mill energy e.g. the energy amount in PfR is not available in data sets.
 - Mill energy from wood residues and sludges, how to handle this?
- Water depletion
 - The method with regional scarcity indexes should be used for at least core processes (Water footprint standard ISO 14046).
- Biodiversity, Land use
 - More time needed
 - Projects on this





Future use of PEF



Communication of results – big challenge?

- How to use the PEF results
 - As base for reporting
 - Eco-labels

- Guide on how the companies can use the results in house and communicate performance B2B or B2C, how will they benefit from making PEF of their products?

- Involvement of retailers, customers etc, what information do they see as important?



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