

The EU Product Environmental Footprint (PEF) Methodology

What can it deliver and what not? An NGO viewpoint

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Short introduction to PEF and the purpose of this paper

Figure 1: EU pilot phase for developing PEFCRs



The EEB advocates for a better alignment of the different strands of EU Product Policy such as Ecodesign, Energy-labelling, Green Public Procurement (GPP) and Ecolabel as well as with sector-specific legislation such as the EU Construction Products Regulation (CPR). All these policies are based on some sort of Life Cycle Analysis (LCA). Thus, **PEF could help harmonizing the scientific assessments used for Product Policies** in the EU when dealing with the same or comparable product categories.

The **proliferation of non-substantiated green marketing claims confuses consumers about the real environmental performance of products and services that they buy**. Therefore, the EEB supported the objective of the European Commission's communication on "Building the single market for green products" in 2013. It laid the foundation for testing the PEF methodology during a three years' pilot phase that is supposed to come to an end in spring 2018. During that period, so called Product Category Rules (PCRs) were developed with the aim to generate robust and reliable information on the environmental impacts for more than 20 different product categories, all based on a set of harmonized PEF methods for carrying out a LCA study. Figure 1 outlines the process in more detail.

Those **Product Environmental Footprint Category Rules (PEFCRs) aim at identifying the most relevant environmental impact categories and activities along the life cycle for a respective product category**. Only those will be considered for a final (aggregated) assessment, but all results shall be kept and made available. These calculations could eventually allow the European Commission, public authorities and the private sector to assess, benchmark and communicate a so called PEF profile.

The EEB participated in the Steering Committee for the EU pilot phase as an important stakeholder but we were not involved in the development of any specific PEFCR. Our priority was to help identifying environmental hotspots over a product's life cycle through a robust methodology.

The PEF methodology should help companies to evaluate and better understand the most relevant environmental impacts of their products and services. However, the EEB has criticized from the very beginning of the pilot phase that no clear policy options were defined for the utilization of the PEFCRs being developed, in particular with regard to the communication of the resulting PEF profile.

Therefore, the purpose of this paper is to inform the upcoming discussion about the potential use of PEF as an assessment method

- a) for companies to identify and evaluate the environmental profile of their products;
- b) in the context of different product policy instruments such as Eco-Design, GPP or Ecolabels;
- c) and potentially for substantiating green marketing claims.

In this paper the EEB presents its viewpoint on what PEF can deliver and what not, including different reflections from discussions with experts from our NGO community working on sustainable consumption and production, circular economy and the role of environmental product policies. In a nutshell, we are convinced that PEF must be complemented by other assessment tools to create a meaningful basis for (political) decision-making about the environmental improvement potentials and related requirements for products and services.

In particular, product related information to end-consumers cannot be based on the PEF-profile alone as some major environmental impacts such as biodiversity as well as relevant aspects of concern e.g. regarding health and quality are not included in its scope or cannot be captured adequately through LCA indicators. In our view, the PEF profile must not be used as a stand-alone communication vehicle because of these important limitations. The EEB invites other stakeholders to discuss together with the Commission during the transition phase 2018-2020 how the usefulness of the PEF toolbox can be further improved and for which future policy applications it should or should not be considered.

Can we trust in the results of the EU pilot phase?

Several reports were carried out that put some scrutiny on the activities and results achieved within the pilot phase. The following findings are particularly relevant for our EEB assessment of PEF being fit for its intended purpose(s):

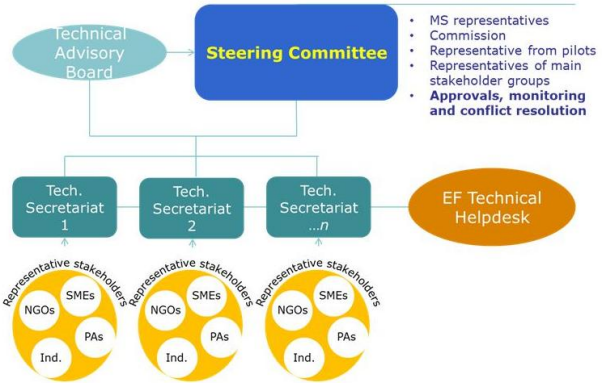
- The [technical evaluation of the EU Environmental Footprint pilot phase](#), carried out by the Environmental Footprint Helpdesk (April 2017),
- The [final report of the Environmental Footprint pilot peer reviewers](#) (August 2017),
- The [final report on the verification stage](#), carried out by Ernst & Young (2017),

In addition, the EEB looked at the well-established [Principles of the Global Reporting Initiative \(GRI G4\)](#) that are fundamental to achieving transparency in sustainability reporting of companies. In fact, there is also a large overlap with the recently published [UNEP Guidelines for Providing Product Sustainability Information](#) to empower and enable consumer choice. We believe that those frameworks can give us some good indications about the respective strengths and weaknesses, opportunities and constraints of the PEF methodology, both in terms of the process developing PEFCRs and in terms of the resulting outputs in form of a PEF compliant LCA study. This evaluation leads us to some important intermediate conclusions from an overarching perspective before discussing the more technical details and potential future applications of the PEF toolbox.

Stakeholder Inclusiveness: Accessibility and Transparency of the process

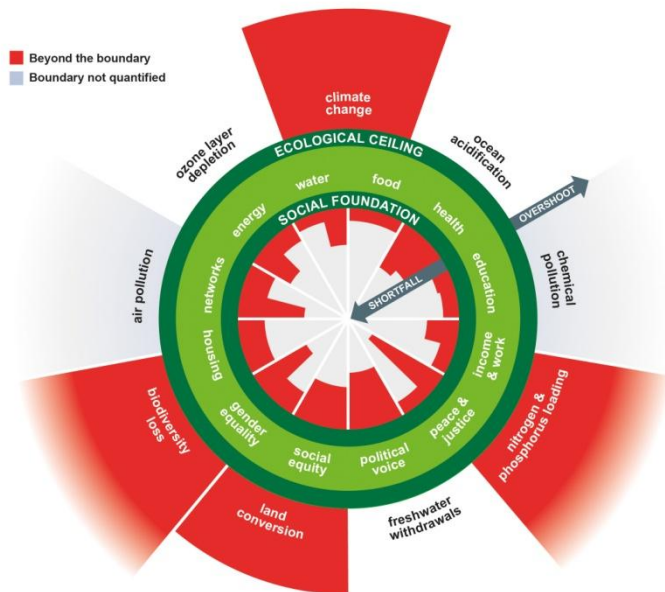
Although the European Commission reached out to a vast amount of stakeholders during the pilot phase, only very few representatives from environmental and consumer NGOs had capacities to follow the process in depth or even engage at the detailed level of the technical secretariats for developing the PEFCRs for a specific product category. Based on available information, NGO's were only involved in 2 technical secretariats and in 2 critical reviews. As a consequence, there were mainly industry experts and their contracted LCA consultants shaping the PEF rules with quite limited external scrutiny and involvement of civil society groups as documented in the three rounds of public consultation and critical review panels.

Governance structure of the PEF pilot phase



All meetings, documents and decisions were documented via online wiki pages for registered stakeholders. But it was even hard for insiders of the process to keep track of all relevant developments. Unfortunately, none of the supporting PEF studies that were carried out by the pilots on real products were made accessible because of business confidentiality reasons. This situation remains until today the major bottleneck to better understand, compare and assess the impacts of the agreed PEFCRs. To conclude, the PEF pilot phase did not help overcoming the black box of Life Cycle Assessment. Despite the heavily formalized process of developing the PEFCRs, external stakeholders will find it hard to judge if they are either really state of the art or rather biased because of conflict of interests.

Sustainability Context: Relevance versus Completeness of PEF



Kate Raworth & Christian Guthrie: The Lancet Planetary Health

If you put PEF in the context of the discussions on the United Nations' Sustainable Development Goals and its relevance for promoting more sustainable consumption and production, many will point out immediately that it misses out on the social and economic dimensions. Although this is certainly a short coming to be recognized, also other tools for integrated sustainability assessments rely on distinct methods e.g. for valuing financial, social, health or environmental impacts. With regard to product-related assessments, nobody will however doubt the relevance of the environmental dimensions and the merits of having a standardized approach towards them.

The PEFCRs put a lot of emphasis on identifying the most relevant environmental impact categories, life cycle stages, processes and activities while cutting off the less important ones. Significance of any parameter can only be assessed based on some kind of threshold at which environmental impacts become sufficiently important for the overall assessment so that they should be taken into account when calculating and reporting a PEF profile. This is only possible if normalization and weighting among the impacts categories are included, and if the methodology is comprehensive and inclusive.

In its present version, PEF struggles as some relevant impacts e.g. on ecosystem functions, biodiversity or toxicity are not well captured by the applied LCA methods, indicators and datasets. Through the aggregated assessment methodology, the resulting PEF profile seems to give a full picture of all relevant impacts, but this is not necessarily the case. Adding to these shortcomings, there is no requirement to communicate these gaps. To ensure that all significant aspects of a product category are included in its environmental assessment, stakeholder feedback should be included and documented in the identifications and prioritization process instead of relying only on normalized and expert weighted PEF scores. For the identified gaps, the PEF profile must be complemented by other environmental assessment criteria, even if they cannot be based on a quantitative method yet.

Balance, Comparability, Accuracy

The EU pilot phase resulted in a lot of agreements on horizontal and sector/ product specific rules for PEF, prescribes the use of harmonized data sets, and streamlines rules for modeling environmental impacts to allow for comparisons within certain product categories. Unfortunately, the technical evaluation found that all these decisions were not implemented across all pilots in a consistent way and quality issues e.g. on data sets to be used remain unresolved. Although the calculated figures indicate a high level of accuracy of the PEF profile, this cannot be taken for granted in all respects. The PEFCRs put a strong focus on comparability with a benchmark representing the European market average that is only valid for a very narrow definition of a specific product (sub-) category. This is not a very balanced approach considering the different needs of policy makers, business and consumers.

In order to stimulate further improvement of environmental performance of a certain product, PEF needs to ensure that there is significant potential to differentiate between different solutions. It is not clear if this is the case with the current granularity and different approaches to definitions of scope and functional units in the PEFCRs. Policy makers might need comparisons between different product categories to allow for decisions on effects of substituting e.g. meat through vegetarian food. Consumers might want to know additional information on specific contents or properties of a product such as pollutants, longevity, or certifications ensuring sustainable sourcing of raw materials. PEF allows for integrating additional environmental information but it would not be taken into account or even weighted for the overall assessment. Moreover, not all pilots make use of this option anyway.

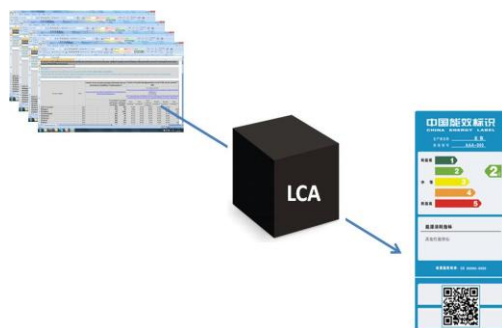
Timeliness, Reliability, Clarity

The EU pilot phase on PEF was designed as a bottom up process where industry sectors could apply for voluntary participation. If they were selected and followed the procedures up to the very end, a final version of their PEFCR could be adopted in spring 2018. If industries decided not to take part in the pilot phase or stopped their work because of disagreements, the respective product categories are simply not covered by the scheme. Obviously, this process did not ensure that we have now up-to-date PEFCRs for the environmentally most relevant product categories in place. There are also con-

cerns that future development of PEFCRs and assessments undertaken without a specific PEFCR being developed at all will not undergo the same scrutiny than during the pilot phase.

The timeliness of regular updates and revisions of PEFCRs in the future will become a major stumbling block for the credibility of the whole scheme. If more innovative LCA and non-LCA methods become available in the future that are able to cover emerging environmental challenges or societal needs more quickly or more adequately, they will have to be integrated into PEF or they will simply outperform the more conservative PEFCR approach.

We also must scrutinize continuously how PEF looks on real products and if the interpretation of PEF scores deliver meaningful information for policy makers, business or consumers. Therefore, the verification procedures put in place cannot be limited to only checking if the respective PEFCR has been implemented correctly. It should incorporate a critical review panel comprised of different stakeholders that also check the potential shortcomings and gaps in the assessments and interpretations being made.



The PEF methodology requires additional guidelines and more clear rules on communication that have not yet been agreed during the EU pilot phase. Just presenting the PEF profile e.g. in form of abstract environmental performance classes will not help any stakeholder looking for a comprehensive environmental assessment of the product concerned.

Intermediate conclusions

When concluding on whether or not we can trust in the results of the EU pilot phase on PEF, it is quite a mixed picture: Some might say the glass is half full; other might say it is rather half empty. According to the EEB's own assessment, PEF is essentially an EU harmonized LCA toolbox that still has some serious methodological shortcomings. But those could be overcome in the future if they are clearly acknowledged and addressed instead of being disregarded when discussing future (policy) applications for PEF. Therefore, the existing limitations of the PEF profile shall be included in any communication vehicle. As these limitations can result in misleading overall results, the EEB cannot support the use of the PEF profile or environmental performance classes based on it as a tool for Business-to-Consumer (B2C) communication. Even in Business-to-Business (B2B) communication these limitations might lead to incorrect decisions e.g. in the context of corporate environmental strategies or (public) procurement processes if not interpreted carefully and complemented by other assessment tools.

How does PEF capture the most relevant environmental impacts?

For the majority of products, impact categories related to climate change, natural resources (including land use) and toxicity dominate the environmental profile of life cycle assessments. Of course, the respective weight of these impacts looks quite different, depending if we are talking about an electronic, a chemical, a textile or a food product. But whatever analytical methods are being used in isolation or in combination, when it comes to the interpretation of the results and communication to different audiences, we need to use carefully tailor-made instruments that can go beyond the calculation of a PEF profile, using e.g. cut-off criteria or incorporating chain-of-custody certification schemes as currently applied in many ISO Tier 1 (i.e. multi-criteria and third-party verified) Ecolabel schemes.

To illustrate problems with the current set of PEF default indicators and calculation methods, the EEB would like to point to the following examples:

- As long as PEF excludes **human toxicity and eco-toxicity** from being used for communication, it will give a **biased picture on the environmental profile** for many product groups. You cannot **praise the environmental benefits of a product emitting less carbon emissions compared to the market average while at the same time the consumer might be exposed to hazardous substances**. Even with an aggregated score for toxicity, there might still be a need to tackle the absence of specific substances of concern as a priority when it comes to differentiation and communication regarding environmental, health or safety issues related to the specific product. A low relevance of the PEF toxicity indicator compared to other impact categories should not hide the need to minimise the content of hazardous substances, depending e.g. on the overall quantities of those products being put on the market, the exposure to workers, users, recyclers and the risks of contamination in a circular economy.



- **Impacts on biodiversity and ecosystem functions** are not part of the PEF guidance in a state-of-the-art, LCA compatible methodology. Instead many pilots simply claim that they are partly covered by other impact categories such as climate change, land use, water use, eutrophication or acidification. Considering that the current loss of biodiversity is one of those environmental impact categories where we are already exceeding planetary boundaries¹, **PEF should integrate a distinct indicator for it**. The UNEP SETAC Life Cycle Initiative on the assessment of biodiversity impacts of land use in LCA² tries to capture the main challenge of aggregating and weighting impacts on a local or regional level. The proposal incorporates factors such as species richness, habitat configuration and quality, regional state and pressures as well as irreplaceability and vulnerability at the relevant scale of analysis.



- Finally, the so called **Circular Footprint Formula** addresses the uptake of reused and recycled content plus diverse end-of-life scenarios. At the same time, most PEF CRs ignore the huge potential of keeping products, components, and materials at their highest utility and value through new business and usage models. Instead the use phase is either excluded or modelled around the assumption of standard (linear) consumption patterns, often including a fixed average product lifetime. To allow for more differentiation on environmental per-



¹ <http://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html>

² http://www.lcaforum.ch/portals/0/df61/DF61-01_Curran.pdf
<http://www.sciencedirect.com/science/article/pii/S0959652615010495>

formance in a sharing and circular economy, possibly the definition of the functional units in those PEFCRs needs to be revisited. The Joint Research Centre of the European Commission has already developed a more targeted, LCA based approach to assess and improve such aspects of energy using products related to lifetime extension such as durability, repair and reuse through the so called “Resource Efficiency Assessment of Products” (REAPro) method³.

All three examples above highlight current shortcomings of the existing PEF methodology that require a combination with other, complementary assessment tools, also going beyond traditional LCA approaches, including relevant sector standards or chain of custody certification schemes. Such a pragmatic approach will hopefully trigger further improvements of PEF default indicators in the future.

Which type of future applications of PEF could we imagine and support?

An important but partial contribution to the analytical framework for EU Product Policies

The European Commission prepares a lot of different impact assessments to develop and justify policy measures such as minimum Ecodesign requirements for energy-related products, performance classes and ratings for the EU Energy Label, green criteria for public procurement, Environmental Product Declarations (EPDs) and the EU Ecolabel scheme. **PEF could help aligning the analytical part of those preparatory studies across the different policy instruments with regard to the identification and quantification of the most relevant environmental impacts. It would also extend the scope of analysis beyond the current focus on energy related carbon emissions while improving comparability at least for some but certainly not all relevant environmental aspects. Unfortunately, it is not clear if the aggregated PEF profile or even a single score will allow for sufficient differentiation between products.**

For example, there is a need to distinguish more clearly between aspects directly related to the generic properties of a product and those impacts that are specifically associated to the geographical location of sourcing of raw materials, production processes, energy consumption during the use phase or disposal of waste. In this case, a more differentiated PEF profile could inform which set of policy instruments will be appropriate to address the relevant aspects: for example an Ecolabel that reinforces the manufacturer’s environmental sourcing and design choices or stricter legal emission limits for production processes in industrial facilities. Such policy instruments can and shall be supported by LCA to avoid burden shifting and green washing. In addition, the PEF assessment could also be used as a cross-checking and optimisation tool to avoid or mitigate trade-offs between different environmental dimensions (see below).

Although the PEF indicators deliver very precise figures, there are still significant uncertainties hidden in their calculation due to data quality or methodological issues which need to be made transparent. Therefore, it is important to recognize that PEF methodology needs to be complemented by other assessment tools, expert panels or product-related standards because LCA methods alone do not deliver robust, verifiable and enforceable criteria or thresholds. For example, a comparison between two products exclusively based on their PEF profiles will actually not show the environmental advantages of a repairable product compared to a non-repairable option. Products contributing to environmental pollution through the release of micro-plastic particles may still result in good scores in the main PEF

³ <http://publications.jrc.ec.europa.eu/repository/handle/JRC104065>

impact categories. Producing agricultural commodities or sourcing of critical raw materials might be handled in a very resource-efficient way but could cause at the same time serious environmental degradation at its distinct geographical location that is not captured properly in relevant LCA databases.

In a nutshell, PEF can deliver an important but only partial contribution to the analytical framework for EU Product Policies. For assessing the environmental improvement potential for a certain product category, it is necessary to identify specific criteria and thresholds that allow a clear differentiation of environmentally superior products and services compared to others being available on the market.

A potential verification tool for substantiating green marketing claims



Many companies already use LCA studies to evaluate the environmental benefits of the product innovations that they offer, others do not. Until today, everyone defines the scope and methods of their often very selective studies on their own so that they lack consistency and comparability. **Robustness of green claims made by producers shall be verified through a study compliant with the respective PEFCRs in order to ensure that the overall environmental profile of a product is taken into account instead of focusing only on isolated aspects or impact categories that show positive results.**

In order to be fit for this purpose, PEFCRs must continuously be reviewed and updated so that they can incorporate new environmental challenges or societal needs. In line with the Compliance Criteria on Environmental Claims⁴ developed in support of the implementation and application of the Unfair Commercial Practices (UPC) Directive (2005/29/EC), companies should be obliged to back up the environmental benefits of their products by providing adequate evidence. The European Commission could explore together with EU Member States how to make best use of PEFCRs to enforce the related provisions of the UPC directive, making the following non-binding recommendations in the context of green claims more tangible:



- Environmental claims should relate to aspects that are significant in terms of the product's environmental impact during its entire life cycle.
- The environmental benefit claimed should not result in an undue transfer of environmental impacts (i.e., it should not create another negative environmental impact during the product's life cycle), unless the product's total net environmental benefit is significantly improved.
- Environmental claims should be substantiated by scientific evidence that is clear and robust. Manufacturers must be ready to make this evidence available for public scrutiny and to enforcement authorities, of course.

In this regard, the EEB sees a possibility to strengthen the implementation of the above mentioned Compliance Criteria: companies would only be allowed to communicate about distinct green properties of their products that differentiate them from their competitors if a PEF compliant study shows that

⁴ http://ec.europa.eu/consumers/consumer_rights/unfair-trade/unfair-practices/files/mdec_compliance_criteria_en.pdf

they perform at least better than the market average identified as a benchmark in the respective PEFCR. If manufacturers want to communicate an overall superior, best in class environmental profile to their customers or consumers, an ISO Type 1 multi-criteria verified Ecolabel will still be the best solution.

This approach should not (!) entail the introduction of a product marking such as 'PEF approved' or even a new PEF rating/ graded label. It would just aim at simplifying the work for enforcement authorities and at the same time it incentivizes manufacturers to target the environmental optimisation of their product in a more comprehensive way instead of only focusing on an isolated aspect that is chosen because of marketing reasons.

Can we use PEF information for B2B and B2C communication?

PEF should be used in the first place as a B2B data vehicle along the supply chain to facilitate information exchange and collaboration on identifying environmental hotspots and to encourage discussions how to best mitigate related impacts.

In this regard, PEF could become one of the future building blocks for an EU harmonized and sector-wide Environmental Product Declaration (EPD) scheme provided comparability and quality of the data for construction products can be ensured. In addition, ambitious Green Public Procurement (GPP) may require a PEF study for environmental innovations as a means of verification. This would help if they cannot be captured adequately by technical specifications that are adapted to conventional solutions. In order to qualify for GPP, they still need to prove that they perform better than the market average identified as a benchmark in the respective PEFCR. Therefore, the EEB suggests that the European Commission investigates potential synergies between PEF and the existing EU Environmental Technology Verification tool (ETV)⁵.



In general, we should not consider a PEF profile as a stand-alone communication vehicle, neither for B2B nor for B2C. It is in the first place an internal tool for companies. It helps them to take a picture of their environmental impacts for a given product in a given moment. It can contribute to the monitoring of environmental improvements and managing impacts associated with the products concerned. But it does not immediately translates into options how to best reduce environmental impacts. For doing so, the analysis must be accompanied by an eco-design approach and product specific criteria. If those are set at the right ambition level, the products can be awarded with an ISO Type 1 Ecolabel that is also a simple visual marking for consumers triggering effectively purchasing decisions.

The PEF profile for a specific product category could support the criteria developing process for Eco-Labeling but as explained above the scope should not be limited only to the main LCA impact categories and potential environmental performance classes identified in the PEFCRs. Instead, the environmental hotspots identified for each product group should be addressed as a minimum through the multi-criteria approach of existing Ecolabel schemes. But they may also take on board other environmental, health or quality related concerns for the respective target group of the schemes.



⁵ https://ec.europa.eu/environment/ecoap/etv/about-etv_en

The EU Ecolabel Label should maintain its objective of marking products and services of environmental excellence which requires distinct features that can be easily understood by the consumer and 'translated' into clear benefits that separates them from other, non-labelled products and services. The PEF methodology can inform the criteria development process but the possibility to address additional aspects that are relevant for the environment and for consumers must be kept.

Our recommendations for improving the usefulness of the PEF toolbox

1. Focus on its key function as an internal assessment method for business to evaluate & optimise the environmental profile of their products and services, as well as an important tool to avoid or mitigate trade-offs between different environmental impacts;
2. Make sure that all relevant environmental impact categories such as toxicity and biodiversity as well as the necessary differentiation of business and usage models in a circular economy can be captured thoroughly either within the PEF methodology or through complementary non-LCA approaches;
3. Combine economic input-output analysis with PEF data in order to map impacts from global supply chains and to help identifying the most relevant product categories that should be covered by EU Product Policies⁶;
4. Consider the PEF profile not (!) as a stand-alone tool for informing product policies or B2B communication but acknowledge its gaps and shortcomings, including the need to look beyond LCA data, taking into account e.g. relevant expert views, standards or certification schemes;
5. Investigate how PEFCRs could help fighting misleading green claims in the context of the implementation/application of Directive 2005/29/EC on unfair commercial practices without creating a PEF mark or even a graded PEF label that would confuse consumers;
6. Do not (!) use the PEF profile for B2C communication but check carefully how PEF related information could support and not undermine the development of meaningful criteria for ISO Type 1 Ecolabels⁷.

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<http://eeb.org/work-areas/resource-efficiency/product-policy/>

<http://makerresourcescount.eu/>

⁶ For more details investigate the use of tools such as Exiobase: <http://www.exiobase.eu/>

⁷ Similar work has already been started to assess synergies and differences of Product Environmental Footprint (PEF) and the Nordic Swan Ecolabel in their approaches to environmental information of products. An initial evaluation report can be downloaded here: <http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A1105114&dswid=-6893>