CRITICAL REVIEW OF PRODUCT ENVIRONMENTAL FOOTPRINT (PEF)

WHY PEF CURRENTLY FAVORS SYNTHETIC TEXTILES (PLASTICS) AND THEREFORE ALSO FAST FASHION

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The paper primarily builds on research and evidence from 3 longitudinal research projects at SIFO, Oslomet, Norway: CHANGE: Environmental system's shift in clothing consumption; Wasted Textiles: Reduction of synthetic textiles and the amount that goes to waste; LASTING: Sustainable prosperity through product durability.

Introduction

Our concern for PEF is based on our clothing research, as well as our participation in the Technical Secretariat for the development of the Product Environmental Footprint Category Rules (PEFCR) for apparel and footwear. The favoring of plastics is due to a series of unfortunate circumstances, but also more conscious choices. We will first summarize how plastics and thus fast fashion (FF) are favored in the PEF scheme (in LCAs in general and LCA-based tools specifically, such as the Higg MSI). Then we will show how knowledge about the use phase is ignored and how plastics are favored through the way the use phase is planned to be measured. Our conclusion is that PEF for apparel will further accelerate the share of fossil materials in clothing as well as promote FF and greenwashing, and hence is not in line with the intentions of the EU's textile strategy.

Favoring plastics in LCA-based comparisons of fibers/ LCA tools favor plastics

There are several reasons why LCA-based tools favor synthetic fibers. This is a problem with today's LCA methodology because:

- The system boundaries for synthetic and natural fibers are different and the renewability or non-renewability of raw materials is not fully considered, thus favoring synthetics (Kassatly & Baumann-Pauly, 2022; Wiedemann et al., 2022).
- None of the major environmental impacts specific to plastics (non-biodegradable, non-renewable, microplastics) are among the criteria included in LCAs or PEFCR (Kassatly & Baumann-Pauly, 2022).
- The emphasis on land use favors synthetics because any positive effects are not considered, such as keeping landscapes open, and contributing to soil health and biodiversity through grazing (Kassatly & Baumann-Pauly, 2022; Make the Label Count, 2022).

- The current land use impact category in PEF (LANCA) or conventional LCA methods favor intensive or land-less production methods, which is the direct opposite of established sustainability knowledge (extensive, low-input production systems have a lower impact on the environment and vice versa).

- Global averages conflate that the geographical, site-specific differences in production-modes (irrigation/rain-fed for cotton, land-use for sheep, etc etc) are much greater than the differences between all the fibers. In addition, when comparing synthetics to natural fibers, the only available data for synthetics is from Global North production, which is much more environmentally friendly than in China, which further skews in favor of synthetics (Kassatly & Baumann-Pauly, 2022). Lack of specific primary data results in the failure to capture regional variations in environmental impacts.

- Lack of inclusion of diversity, tradition, culture, crafts, local industry, and cultural preservation (including indigenous people) in LCA; in the textile strategy as a whole, and in PEF, means that the positive effects of alternatives to synthetic textiles/FF are not emphasized (Løvbak Berg et al., 2023).

For PEF, the additional problem is that it has been, and probably also will in the future, be based on the same data and thinking that underpins the Higg Index. The problems with this tool (and similar ones developed by the industry itself) are many and complex (Kassatly, 2023; Kassatly & Baumann-Pauly, 2022), such as;

- the use of LCA studies that are not intended for comparisons
- the use of outdated studies
- the use of global averages when the differences are based on studies that are not representative and in addition when the decisive data related to the environmental impact is place-specific.

The Norwegian Consumer Authority has ruled that the use of the Higg Index-based label is illegal in consumer-oriented marketing in Norway, and other countries are following suit (Norwegian Consumer Authority, 2022). It is uncertain what kind of data will ultimately be fed into the PEFCR, and whether any suitable data for actual comparisons of fibers and materials exists. Should PEFCR make sense, it must be based on product-specific data, but does this exist, and does it include the most important stages of environmental impact (dyeing and finishing, as well as use)? Fiber environmental impact in LCAs accounts for only 12-15% (UNEP, 2020; Wennberg & Östlund, 2019). The problem with much of apparel production is that the products are on the market for a short time and reliable data about both production and lifespan can be difficult to obtain.

The use phase in real life, and in PEFCR

In PEFCR the plan is for apparel's "lifetime" to be measured mainly as strength. Efforts are being made to modify this, but it is difficult to agree on good ways to predict service life based on design. Strength has the advantage that there is a rich repertoire of technical standardized test methods and that the measures, therefore, appear objective and verifiable (e.g., tearing strength, wear resistance, Martindale, fading, and pilling). In contrast, no research shows a correlation between strength and longevity, nor for which clothing or apparel groups, or consumers this applies.

Clothing lifespan can be measured in years, number of times used, washing cycles, or in the number of users, and most preferable is a combination of several of these (Klepp et al., 2020). The number of clothes one owns is decisive for the lifespan of clothes. With many clothes, the lifespan measured in years is likely to increase (Ellen MacArthur Foundation, 2017), while each garment is worn fewer times and it is difficult to wear them out before they are out of date, due to fit issues or lack of perceived value.

Studies of consumption show that natural fibers, and thus wool, silk, and cashmere, have major advantages in the use phase in terms of environmental impact. This is due to lower washing frequency and lower energy consumption for laundering (Laitala et al., 2020; Wiedemann et al., 2021). Synthetic fibers are plastic and release microplastics both during use and laundering and break down into microplastics as waste (Henry et al., 2018, 2019). Synthetics and silk are the fibers that are used the highest number of times, while silk and wool blends are used the longest, and wool has the highest reuse frequency (Laitala et al., 2018). Natural fibers have a higher value on the second-hand market. We have less data on what is repaired, but we do know that price is one of the deciding factors on whether to repair (Laitala et al., 2021), and that the price of plastic materials is often lower than natural fibers.

The studies on disposal of clothing show that disposal follows a threefold division between lack of perceived value, bad fit, and wear and tear problems (Laitala & Klepp, 2022). Therefore, only a third of the clothes go out of use because they are worn out. We find the same pattern in studies of the textile waste streams, which show that approximately one third of what is disposed of is visibly worn (Klepp et al., 2022).

Clothes fulfill many different functions and must fill these functions for different people and in all social and physical occasions of life. The many different characteristics are therefore not possible to measure on a scale of good to bad. On the contrary, some properties are desirable in some cases and unfavorable in others (e.g., warmth, water and wind resistance, softness, etc.), even wear and tear can be perceived as positive in some cases, e.g. fading of jeans, but in some cases it is totally unacceptable. FF is often referred to as "bad clothes", but the clothes have no common physical characteristics that distinguish them from other clothes. One characteristic is that they are often made of plastic or have a high proportion of plastic because the raw material is cheap. However, plastics are also used in other clothing (e.g., rainwear and wind jackets) where we want the properties of these fibres. FF is a system not a type of clothing.

In the work with LCA for apparel, the use phase is poorly developed and often not included at all (so-called cradle-to-gate LCAs). This is the case even though the use phase makes the biggest difference when the environmental impact (as it should be) is calculated per wear/number of years, which in LCAs is called the “functional unit”. Some clothes are worn 1000 times and passed down for generations, or like baptism dresses worn only once by each wearer but can have many wearers. Other clothes are not worn even once; they are never sold, or they hang unused in the closet. Consequently, the average number of wears per garment decreases when the number of garments imported/produced and bought in the EU increases. This is completely independent of reuse, repair, and other measures to extend the lifespan - and strength. Because very few clothes are bought as a replacement for something that is broken, increased strength of clothes does not lead to fewer clothes being bought (Maldini, 2019; Maldini & Stappers, 2019). Rather, increased lifespan of clothes will ensure that more of the clothes' potential use is intact when they are thrown away, except for the 1/3 that are discarded due to wear and tear (Laitala & Klepp, 2022). If we don't reduce the amount of clothes that enter our wardrobes in the EU, and if we also make clothes stronger, the clothes that are thrown away will be used even less. Another way of saying this is that we are moving towards single-use/disposable clothing; if this becomes the case, it is better that they are not designed to be used 500 times. For clothes, long life (many wears, many years of use and possibly many users) is of course a major advantage, but stronger clothing does not have this effect if the volumes increase. The problem in the EU is that clothes today are largely (2/3) thrown away long before they are worn out (Laitala & Klepp, 2022). This is, for example, the basis for the large export of used clothing from the EU to the Global South, which tripled in the last 20 years (EEA, Forthcoming, 2023).

The difference between the various fibers when it comes to strength is very large. Plastic materials, such as polyester (which is the largest and today represents over 60% of global fibre production), are significantly stronger than natural fibres. The requirements set for strength will therefore have to be made so low that natural fibers are not penalized (which would make little sense as a criterion), otherwise this will favor plastic. The result of this will be a further increase of plastic blends in clothes with natural materials (to make them stronger). The impact of this can be increased release of microplastics, reduced recyclability (i.e., mixed materials are more difficult to recycle) and reduced usability for consumers (e.g., synthetic clothes smell more and therefore need to be washed more often, which in turn increases the environmental impact).

Consequently, strength is an inappropriate method for measuring clothing lifetime. This lack of correlation between “strength” and durability is not taken seriously in PEF's developments. Currently, important correlations in PEF methodology lack validated claims and empirical data. We recommend to use methods, such as waste analyses and wardrobe studies, and empirical data to develop PEF and other policy tools, such as Extended Producer Responsibility. For the latter we propose Targeted Producer Responsibility (TPR), which applies waste analyses method and is explained here. By looking at the use phase allows to distinguish between disposable products and lasting values and therefore offers by far the greatest potential for reducing environmental impacts. Ignoring the use phase favors FF and leads to disfavoring the clothes that that are used for a long time and by many.

Conclusion

Making plastic the environmental choice is a political responsibility. If the PEFCR for apparel and footwear are to get on a better track, it is necessary to take seriously that any weighting scheme is not mainly natural science based but inherently involves value choices that will depend on policy, cultural and other preferences, and value systems. No ‘consensus’ on weighting seems to be achievable (Sala et al., 2018).

In essence, one can therefore say that PEFCR for clothing favors plastic due to a lack of political decisiveness on how to measure natural versus synthetic materials, together with giving the FF industry power in the development of PEFCR and choice of underlying data. Fast fashion will remain in fashion if those who have the most to gain from it are making the rules.

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