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CONSUMPTION RESEARCH NORWAY (SIFO)

THE PLASTIC ELEPHANT

Overproduction and synthetic fibres in sustainable textile strategies

Ingun Grimstad Klepp, Lisbeth Løvbak Berg, Anna Schytte Sigaard, Tone Skårdal Tobiasson and Lea Gleisberg

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1. Introduction

"It's time to talk about the elephant in the room."

This is a quote from one of many conferences on sustainable fashion and a heartfelt wish from us. As we recall, it was said during the 2014 GFA Sustainable Fashion Summit in Copenhagen, when Livia Firth, founder of the consultancy Eco-Age and the Green Carpet Challenge, was on a panel with H&M. She challenged the growth issue where "fast fashion brands justify growth by saying that it is the consumers who demand the wide selection and diversity of fashion styles today". Firth responded to this claim made by H&M's Helena Helmersson by saying that her children want candy all the time but that does not mean they should get it, and that as a parent she has "a responsibility in addressing this want" (Kant Hvass, 2016, p. 173).

The fashion and textile industry largely operates on a linear business model driven by the logic of extracting raw materials, manufacturing products, and generating profits at the point of sale. The market is dominated by business models based on growth and the sale of large quantities of products. The issue of growth, specifically growth in clothing production and the related environmental impacts, has been called the elephant in the room, that the global fashion industry avoids addressing.

The growth can be measured using the relationship between the number of clothes produced and the population: while global clothing sales doubled between 2000 and 2015, the global population grew only 20%. As a result, the utilisation rate of clothing has decreased drastically. The current situation is unfortunately that clothing is being thrown away before they are worn out, whether they are being burned in Norway and in other Western countries or end up in waste streams in the Global South, with much of its potential use time unexploited. The growth in clothing production has also correlated with the growth in the use of synthetic textile fibres. Recent studies have documented a clear connection between the growth in the number of textiles produced and the share of these that are synthetic. In addition to the waste problem, that is becoming more and more visible, knowledge of the adverse effects of microplastics on the environment and human health is increasing.

In this report we examine whether sustainable textile strategies address the increased production volumes based on synthetic material, and if so, how. This is done through a lens of four questions. First, we look at whether the strategies discuss growth and possible measures to stop growth. Second, we examine whether they address the plastification of textiles. By plastification, we mean the increasing share of plastic fibres used for textile production. Third, whether they discuss the raw material for plastics, and fourth, plastic waste.

The most central concepts will be defined in the following. More detailed explanations can be found in the full report.

1.1 Production or consumption

There are some very strong arguments being made about the connection between supply and demand. The often-cited words "there is no production without consumption" obscures and hinders understanding of the complex interaction between the two. Although much about the intricate relationship between supply, demand, and obsolete inventory is unknown, we know that increased production is not simply a response to the consumers' increased demand. Along the

same line, the effect of reduced demand on production volumes still needs to be considered, the issue of obsolete inventory and discarded unused clothes suggests that it may take more than demand reductions to reduce production volumes.

1.2 Overproduction

The Oxford Dictionary defines overproduction as “[e]xcessive production; production in excess of demand”. The industry itself, however, defines it explicitly as unsold goods. With the term overproduction, we mean the overall growing quantities of clothing and other textiles that exceed consumers’ actual clothing use, and as such constitutes a surplus of clothing, whether these clothes are discarded or stored in the consumers’ wardrobes or never even sold. The overproduction is a major component of the continuous growth that has so far “eaten up” the environmental improvements made through eco-efficiency measures that the industry has put in place (e.g., Fletcher & Tham, 2019). According to Niinimäki et al. (2020), the long-term stability of the fashion industry relies on the total abandonment of the fast-fashion model, linked to a decline in overproduction and overconsumption, and a corresponding decrease in material throughput.

It is evident that the increase in production has resulted in an overproduction of clothing. This is visible in all stages, among consumers and in commerce and in the second-hand trade, as visualised in Figure 1. Though there is little available research on overproduction itself, it can be quantified as unsold goods and goods sold at greatly reduced prices, as clothes that are sold but not used and therefore are stored unused in the wardrobe. The overproduction is also visible in the large volumes of more or less used closed that are exported from the global North and that increasingly remain unused in the importing countries in the global South. How large the overproduction is, not many have attempted to quantify.

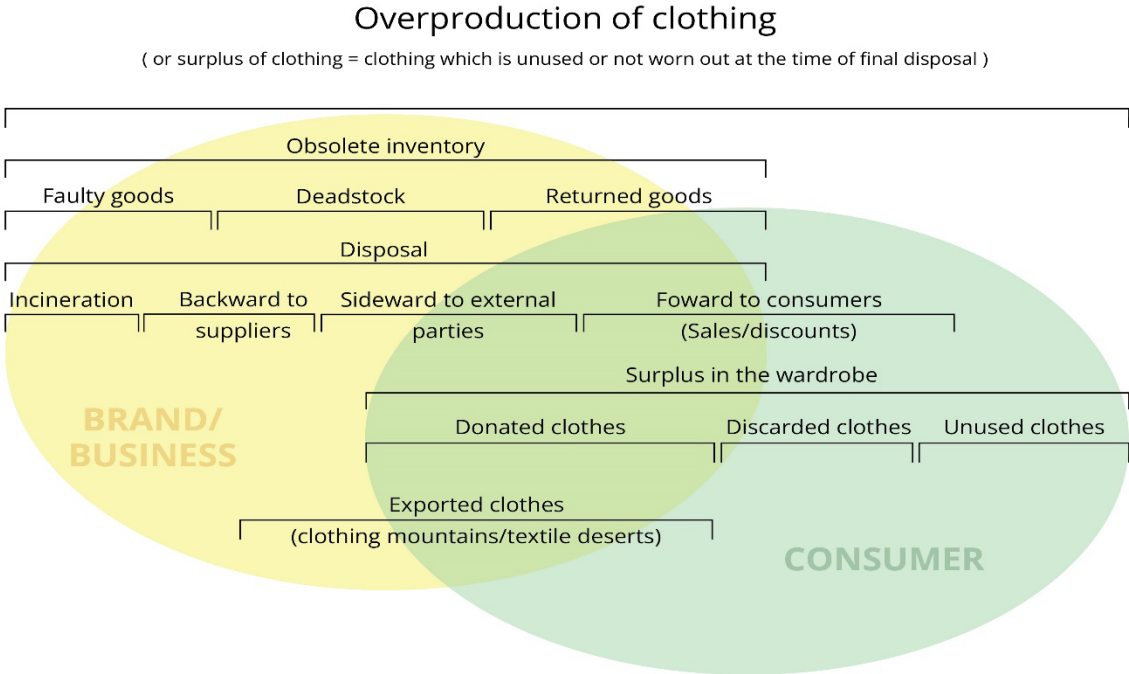


Figure 1 Visualisation of manifestations of overproduction and the resulting overconsumption.

The categories overlap and interact. Businesses produce more clothes than can be worn out and use strategies such as sales and discounts to reduce deadstock and unsold inventory. Consumers either donate, discard, or keep unused clothes in their wardrobes.

1.3 Durability, lifetime and volume

The terms durability and lifetime are often confused.

Lifetime can be understood as how much/for how long the product has been or will be used, which can be researched by studying consumption dynamics and behaviours. Note that we use the term consumption in its broader sense to encompass acquisition and use, as well as disposal. Lifetime for clothing can be measured in the number of years it was kept by the consumer or the number of wears, the number of washes and/or how many users a product has had or will have on average (Klepp et al., 2020).

Durability is the quality of being able to last a long time without becoming damaged. This can be measured in tensile strength, abrasion resistance, pilling resistance, etc.

The potential for reducing total volumes and thus material extraction, pollution, energy use, overall production and consumption levels, and transportation that increasing product lifetime holds, is often discussed (Cooper, 2010). However, most clothes are not acquired as replacements but in addition to those one already has (Maldini, 2019). It follows that increased durability does not automatically increase lifetime.

Our knowledge of lifetimes for clothing and other products is increasing and from what we currently know, it is not necessarily the case that more durable products are used longer nor that longer lifetimes lead to fewer clothes being purchased. This is because very few clothes are acquired as replacements for out-worn items.

1.4 Clothing utilisation

Clothing utilisation is the average number of times clothes are worn. An advantage of using the term is that it can be used about individual garments or averages for national or global wardrobes. It, therefore, puts the spotlight on a system and not just individual garments.

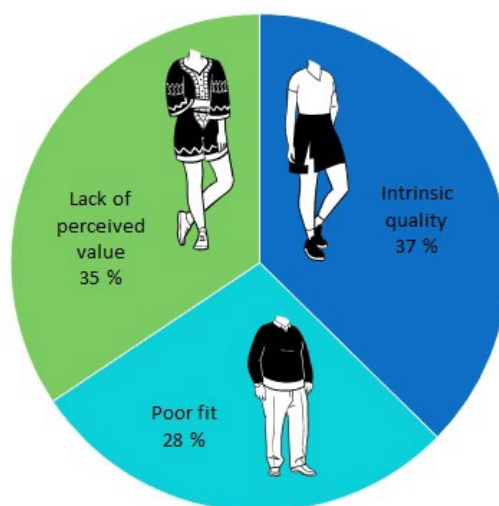


Figure 2 Main reasons for clothing disposal (Laitala & Klepp, 2022)

At the same time, there are great differences between individual garments and types of garments. We know that approximately 1/3 of clothing is disposed of because they are worn out (Laitala &

Klepp, 2022). For this group of clothing, improving technical durability could have an effect on the use time and possibly also on the acquisition of new clothes, that then in turn could influence production quantities. Flipping the two, there is on the other hand a definite connection: if producing fewer clothes led to an increasing utilisation rate, it would in time be necessary to implement measures to increase the lifetime of clothes. The current situation is unfortunately that 2/3 of clothing is being thrown away before they are worn out (Laitala & Klepp, 2022) (Figure 2). It will therefore take a long time before we reach the point where the technical lifetime of clothing will be the most pressing issue. The authors of this report argue that within the current situation of overproduction, it is therefore urgent that we decrease production, and it is not urgent that we increase durability. Additionally, it is emphasized that working towards extended lifetimes of clothing is not the same as working towards increased utilisation or reduction in production quantities.

The knowledge basis for comparing products' environmental impact is lacking, as well as empirical evidence of the effect of design strategies to reduce consumption, or indeed production. It follows that the evidence that better products, more users or repair have the direct effect of increasing the utilisation rate of clothing and as such the production volumes, also is lacking. We, therefore, need to find other measures to implement in order to prevent highly usable apparel from becoming waste.

1.5 Growth and plastification

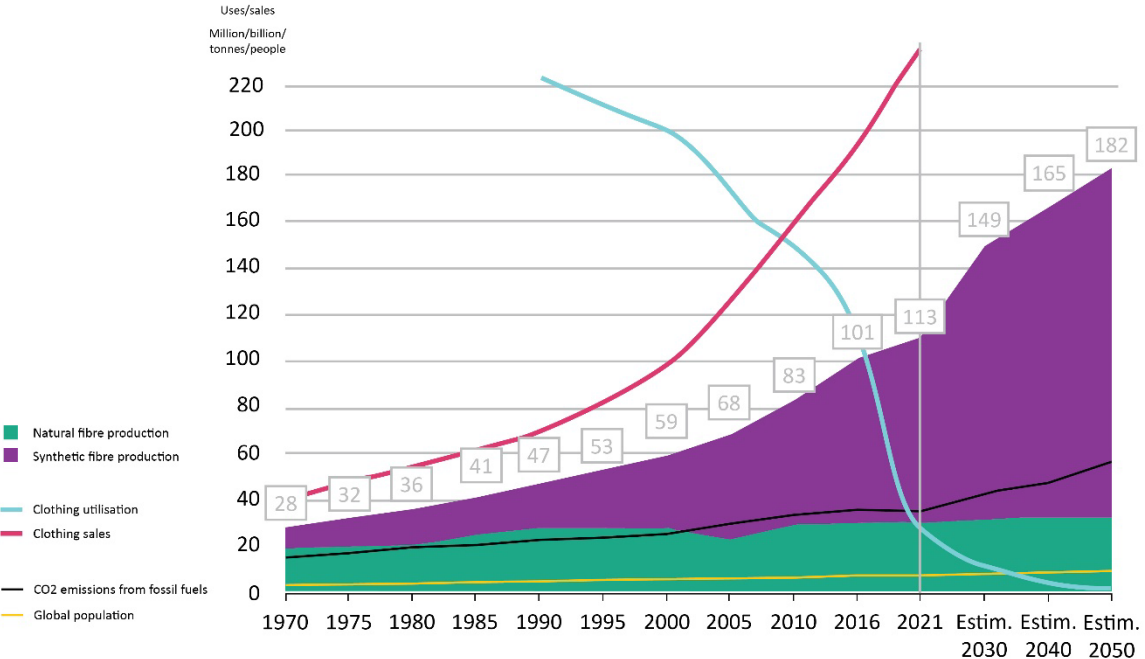


Figure 3 Global fibre production compared to clothing utilisation, sales, CO₂-emissions from fossil fuels, global population and estimated future growth. (Sources: Ellen MacArthur Foundation, 2021; Ritchie et al., 2020; TE, 2017, 2018, 2019, 2020, 2021, 2022; United Nations, 2022; World Bank, 2020)

There are a lot of unknowns concerning the future of plastics, such as whether other raw materials than those of fossil origin will become viable and how much this will cost. We do not know either whether recycling (fibre-to-fibre) will decrease or increase the environmental impacts. Figure 3 shows that there is a correlation between the production of synthetic fibres and growth in

the textile sector. This growth is expected to continue. This entails an increased plastification of textiles. By plastification, we mean the increasing share of plastic fibres used for textile production.

The science concerning the issues created by plastics is relatively new. The most important factors are the shedding of microplastics and fibres and the use of non-renewable and non-biodegradable materials. Research on the development of plastic materials from recycled sources or bio-based raw materials is being done, but opinions diverge on their sustainability.

1.6 Environmental governance in the textile industry

The fashion industry is little regulated but dominated by many and large multistakeholder initiatives (MSIs) within what is often called 'sustainable fashion'. The organisations are closely knit and can be hard to distinguish between. The most important are TE, SAC and GFA, all owned or run by the industry itself, and often with the large global actors as prominent members.

The above MSIs are large and interconnected. They also have overlapping member groups, and at least two of them have economic interests vested in selling labelling schemes and tools to enable businesses to decrease environmental impacts and transition to the circular economy.

In the textile strategies analysed in this report, many of the measures are based on comparing the environmental impacts of products. The most important tools for comparing environmental impacts are made by the industry's own MSIs. Critique has been mounting against this and what aspects are given importance in these tools, in particular against the most used and therefore most influential tool, the Higg MSI.

The critique can be summarised as follows: The fibres make up only a small percentage of the environmental impacts of textiles. There are no reliable data sources for comparing the environmental impacts of textiles based on fibre choices. This is in part due to low quality, outdated and inadequate LCA analyses, but also due to the fact that the location of the fibre production is just as decisive as what fibre is being produced. The LCA-based tools are also critiqued for favouring plastic fibres, among other aspects, because the negative effects of plastics are not included in the parameters of the LCAs that they are based on.

1.7 Decoupling

Decoupling is a term that is used in discussions about whether it is possible to reduce environmental impacts while simultaneously promoting economic growth. The discussion can be nuanced using the terms absolute and relative decoupling, where the latter is in reality not questioned the way the former is, in other words, the dispute is not about whether it is possible to use resources more efficiently, pollute less per produced item, etc., but whether these gains can be large enough to attain the total reduction in environmental impacts that are necessary to halt and reverse climate change and environmental destruction.

2. Our questions

We have done a text/word-based analysis of 12 strategies by asking the four questions that we introduce below.

RQ1: Addressing growth

This question addresses the core issue to reduce environmental impacts, namely the production volumes. We are interested in understanding whether and how production growth is recognised as problematic when aiming for sustainability, and how it is addressed in measures and initiatives, if at all. To receive a *Yes* to the first part of this question, the strategy must recognise the growing volumes of clothing production as a source of increasing environmental impacts. To receive a *Yes* to the second part of this question, the measures proposed must be directly aimed at reducing production, and not indirectly through assumed effect.

On the basis of this, the following question and delimitations were used for the analysis.

RQ1: Does the strategy include/address growth? (I.e., overproduction, quantities)?

- A: in the problem statement?
 - YES: Growth is addressed as a problem that needs to be halted.
 - To some extent/Indirectly: Growth is briefly mentioned as a problem.
 - NO: This is not discussed, or continued growth is a goal.

- B: through measures ?
 - YES: There are measures directly addressing growth, e.g. targeted taxation, import restrictions, quotas, reduction goals in % etc.
 - To some extent/Indirectly: No direct measures but durability (technical/social), longer use, repair, circular business models etc. are discussed, and seen as means for reduction.
 - NO: There are no measures addressing growth.

RQ2: Minimizing plastification

This question addresses the connection between plastification and the growth in production of textile fibres. The increased use of fossil raw materials has enabled growth and continued growth is dependent on continued plastification. The plastification also comprises after treatments with fossil-derived materials in the major dyeing and finishing techniques, but we have limited the discussion to fibres. By plastification, we understand the increase in the per cent share of synthetic fibres compared to other fibres.

To receive a *Yes* answer to this question, the strategy must have an explicit goal to reduce plastic fibre usage and clear measures that will achieve this must be put forward. We do not see bioplastics as a way to reduce plastification, though it may reduce the use of fossil raw materials, if it is not just a biodegradable version of a fossil fibre (see section 2.6, in the full report).

The question and answer delimitations were therefore as follows:

RQ2: Does the strategy attempt to stop and/or minimize plastification?

- YES: Clear goals for reducing plastic fibre usage are presented, e.g. natural fibres and other solutions are put forward.
- To some extent/Indirectly: This is discussed, but no measures are put forward.
- NO: This is not discussed at all or more plastic is seen as a solution.

RQ3: The raw material for plastic

Plastic can be made in many different ways, so also plastic in the form of synthetic fibres. Conventional plastics are made from fossil fuels, but plastics can, among other things, also be made of recycled materials from several different waste streams, from biobased materials or from CO₂ captured from the air. The source determines the environmental impacts of the material. The available sources also depend on technology developments and availability. Textile-to-textile recycling for polyester, the most common synthetic fibre is not commercially available. Therefore, we consider textiles made rPET to be a false solution as this diverges plastic items from an existing closed-loop system, instead creating an item that is not recyclable.

On the basis of this, we have delimited the answer options for the question as following.

RQ3: Is the raw material for plastic addressed? (The source of the material; up-stream supply chain?)

- YES: The problem with virgin plastic is discussed and solutions like biobased, Textile2Textile recycling are put forward.
- To some extent/Indirectly: It is mentioned, rPET is the only solution put forward, if any.
- NO: There is no mention at all of this issue.

RQ4: Is the plastic waste problem addressed?

Plastic waste appears at all stages of the synthetic fibre life cycle, from production to final disposal, as microfibres and as full garments eventually decomposing to microfibres. Therefore we understand this research question as how the synthetic fibres will or will not end up as plastic waste (both through shedding and at the end of life).

Yes to this question is given when this issue is addressed at the root, e.g. decreasing use or compostability. *To some extent/Indirectly* is given when it is not addressed at the root cause but rather symptomatically by reducing waste (e.g., microfiber filters, chemical issues and collection for recycling), or plastic waste is addressed but not plastic fibre waste. As before, *No*, means that the question is not addressed at all.

The question and answer delimitations were therefore as follows:

RQ4: Is the plastic waste problem addressed?

- YES: The problem is addressed at the root, e.g. decreasing use, compostability.
- To some extent/Indirectly: There is some mention of measures that aim to reduce waste. (E.g., microfiber filters, chemical issues, collection for recycling), or plastic waste is addressed but not plastic fibre waste.
- NO: This is not addressed.

3. The method and material

This study is based on document analyses of environmental strategies from three groups of stakeholders in the fashion and textile industry. In addition, video material was analysed for one actor, as the latest available source to their strategy at the time. Altogether 12 strategies were analysed, selected from large brands/businesses, industry organisations, countries and areas with importance for Norwegian policy processes. The latest strategy included is the “EU Strategy for sustainable and circular textiles” from 30th March 2022, which we consider to be the most important, both because it is the most recent and because of its expected impact.

The analysis is text-based and qualitative. We have sought to answer our four research questions by reading and listening to the strategies, with a focus on content rather than the possible intentions. We responded either *Yes*, *Indirectly/To some extent* or *No* to each question when analysing each strategy, as well as pulling quotes that substantiated the responses.

Our interest was to see whether there was a tendency towards one position or another within different stakeholder groups. We, therefore, scored the answers for each of the 4 research questions for each strategy and calculated an average score. This gave an overall impression of how each stakeholder group positions themselves in addressing each question.

In addition, we have examined how the strategies speak about the issues of growth and plastification and the measures they propose or not related to these. Strategies from the following stakeholders in Figure 4, available in the analysis period, January to June in 2022, were analysed.



Figure 4 Stakeholders

4. Results and discussion

In total 12 strategies were analysed: five strategies from public policymakers; four strategies from industry organisations and three strategies from brands/businesses.

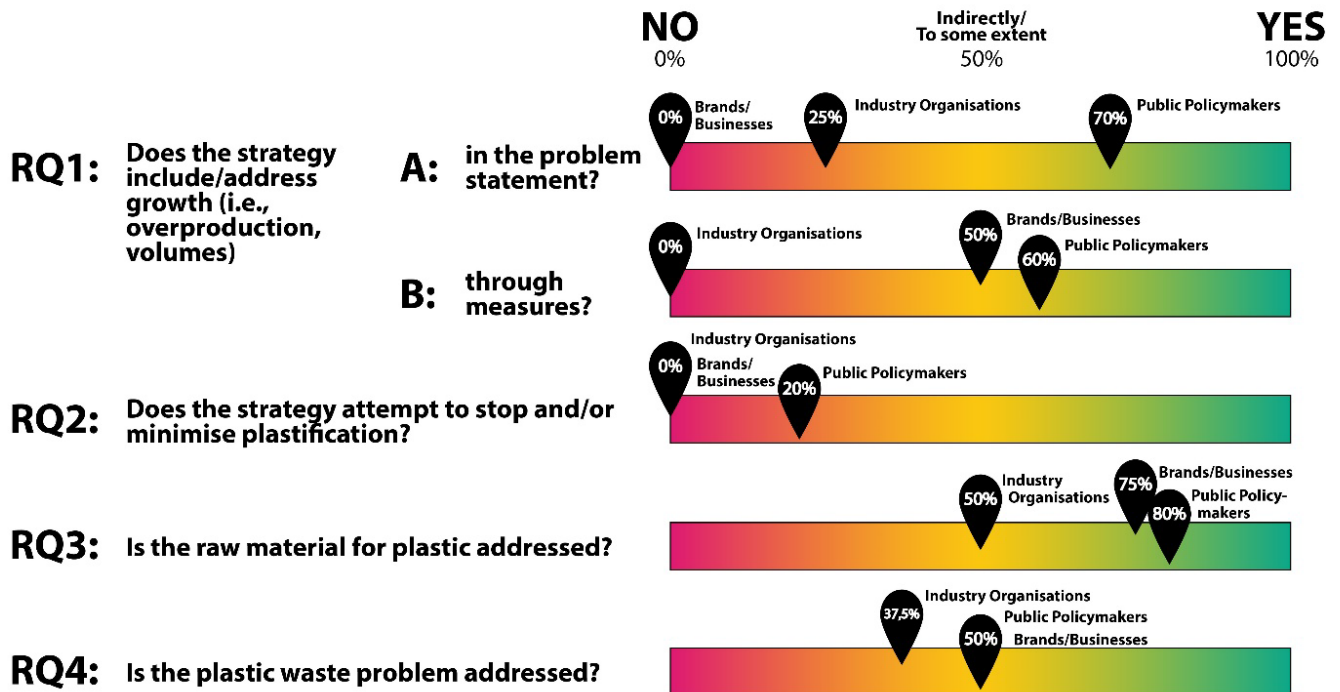


Figure 5 Overview of analysis results: average score for each stakeholder group.

Figure 5 shows the overall results of the analysis. The simple answer to our over-arching question "if how the stakeholders are now addressing the 'elephant in the room'?" is no. In general, the strategies do not address the two fundamental issues of growth and plastification. Nonetheless, we do see a systematic difference between the three stakeholder groups. The problematic aspects of growth are included in the public policies, but not in the brand/business strategies, and the industry organisations score in between the two. If, however, we look at the raw material for plastics and plastic pollution, the tendency is different: here the brands and policy strategies score higher than industry organisations. The most interesting findings are still related to the reduction of the use of synthetic fibres –plastification. This is the question that receives the overall lowest scores. Neither the industry nor the industry organisations include this in their strategies. But more notable is that the majority of the public policy strategies do not discuss minimising the use of plastic for clothing and textiles, a topic that is becoming more and more present in plastic strategies (Conti et al., 2021; EC, 2019).

Below are the main findings for each research question.

4.1 Key findings

On average, the responses to all research questions are closer to *No* than to *Yes*. There are systematic differences between the questions: the strategies are clearer in their formulations of growth as a general problem than in their proposals of measures and solutions to limit the problem. The same can be said for plastic: here they are also defining the issues concerning the

plastics, such as waste and raw material sources more clearly than the measures to combat these issues. There are also systematic differences between the three stakeholder groups and we found that the answers are closest to Yes for the strategies from public policymakers. However, it is possibly most surprising to not find a clearer Yes to the questions from these strategies because they set out to protect people and the environment and set limits for businesses' room for action in environmental destruction.

The responses and key themes that occur related to each question can be summarised as follows.

RQ1A: Does the strategy include/address growth in the problem statement?

There is a clear pattern in the responses to this question, where public policymakers address growth at least *to some extent*, some industry organisations also *to some extent* say that growth is problematic, while brands/businesses do not address the issues concerning growth at all. Only two strategies are awarded a Yes to this question. We found the following themes in the strategies' discussions of growth:

1. A premise for sustainability

There is a focus on green growth and very few of the strategies see economic growth in itself as a problem, i.e., not connecting it to production growth, but rather discuss aims such as "rethinking growth" and "meaningful growth", the aim of which are to create benefits for all involved and that allows more people to choose sustainable options. The necessity of both economic and production growth is also mentioned related to alleviating poverty in the Global South.

2. Consumption and production are the same

Consumption and production are mentioned alternately in the strategies, stating that they are both growing along with their negative environmental impacts, but without their cause-and-effect relationship being addressed explicitly. This obscures the discussion of where the majority of the environmental impact is created, namely in production, and how to achieve a reduction in a supply-driven supply chain where the surplus of goods and extensive use of price reduction and other marketing strategies are embedded in the business models.

3. Fast fashion as a driver

Fast fashion and low-quality of garments are discussed as drivers of overconsumption by public policymakers because they have increased volumes and shortened use spans. However, the fact that these low-priced clothes are also most often made of synthetic textiles, is omitted. Hence, the connection between the fast fashion business model and the growth in the use of synthetic textiles is in most strategies not discussed.

4. Aiming for decoupling

Decoupling is the premise for green growth's success and the strategies all mention this term in connection to either resource use, environmental impacts or climate impact. The underlying premise is that absolute decoupling of economic growth (hence increased sales) is possible, despite empirical evidence to the contrary, including taking the rebound effect into account. The strategies highlight the need to work strategically towards severing the connection between business growth and resource consumption".

To summarise the above, the elephant (growth) is still a difficult topic. The development of the industry and its interests is prioritised and reduction is discussed mainly as eco-efficiency and decoupling. It is promising that the two most ambitious plans have an understanding of growth in production as a problem and that several point to the business model of fast fashion as a driver for growth.

RQ1B: Does the strategy include/address growth through measures?

Overall, the reasoning and measures for reducing growth are weak. However, one strategy, includes this in its “challenge” for textiles and sets a goal for a 60% reduction in the production of textiles from their country by 2050. In addition, it suggests “[i]ncreasing local production with more production on demand”.

The measures presented are mainly based on a belief that decoupling will eventually lead to the desired decrease in total environmental impacts, despite continued growth in sales. To what extent these sales consist of new products, is not directly discussed. The measures presented to move towards this goal are:

1. Materials efficiency/elimination of waste in production

Lowering the impact or resource use of each unit of output is a clear goal, that follows from the decoupling logic, but the discussions of concrete measures are vague. Resource efficiency is the most important factor, which, according to one industry organisation should be related to new materials and products, indicating that using recycled materials is important, but also that changes in consumption, such as re-use are a part of the solution.

2. Durable products

Regardless of the stakeholder, the strategies emphasise changes in consumption through longer use and increasing possibilities for repair, reuse and/or redesign. These are measures recognisable from circular strategy, and that require durability in products, and focus on improvement of physical aspects of clothing, such as strength, obtainable through industrial processes and innovation. The issue here is that it is not explained how increased product durability will influence the quantity that is being produced, rather it is taken for granted that production will decrease if products last longer.

3. Circular products

The focus on circular products and circular business models is present in all strategies. In this discussion, repair, reuse, etc. is given some space, but a large amount of attention is directed at recycling, citing goals of 60-80% recyclable products and scaling up textile-to-textile recycling etc. We repeatedly see that ‘decoupling’ constitutes the bulk of the potential for reduction of the environmental impacts with two main measures at the centre: “material substitution” and “filling the innovation gap”, which both have recycling as their core measure.

4. Consumption

The strategies high-light the need for changes in consumption patterns, where the industry needs to offer better and more circular products to consumers, but where also consumer demand must be increased for these business models, e.g., through consumer

education. The businesses and industry organisations do not speak of reduced consumption directly. The exception is the Danish strategy, which sets a goal for reduction in Danish textile consumption.

RQ2: Does the strategy attempt to stop and/or minimize plastification?

None of the strategies present clear, direct measures to halt plastification. Admittedly, some strategies from public policymakers can be said to indirectly include such a goal. They may have goals of reducing the use of fossil raw materials in production by using other raw materials. We do not see bioplastics as a way to reduce plastification, though it may reduce the use of fossil raw materials if not just using a biodegradable version of a fossil fibre.

1. Fossil free?

The dependency on fossil materials is discussed and quantified in most of the strategies, as well as the need to halt this, but the overall plastic volumes are not addressed directly. Instead recycled or bio-based solutions are proposed to decrease dependency on fossil raw materials. The exception is one strategy from public policymakers, which proposes a goal for their national textile sector to be 40% fossil free by 2050, which constitutes a minor decrease from the current level.

2. The fibres are not comparable

Though there seems to be a consensus that dependence on fossil materials is unfortunate, the EEA report enters an additional aspect to this discussion, asserting that “[s]ynthetic fibres are inexpensive and versatile, enabling the production of cheap fast fashion and high-performance textiles for durable clothing” (EEA, 2021, p. 5). Nonetheless, no measures are suggested to halt this development, rather the argument used is that all fibres should be used for what they are best suited for and that all have environmental impacts. We agree with the latter proposition but question whether it is not the price and availability, rather than the suitability for so many applications, that has spurred the exponential increase in their use.

3. “Preferred Fibers”

Many of the strategies, in particular those penned by the industry itself, highlight certain fibres as better than others. What one strategy calls “Smart Material Choices”, another calls “Preferred Fibres”, etc. These strategies are all based on substitution, where recycled polyester (currently rPET, but preferably textile-to-textile), plays a major role. The role of substitution is disproportionately large compared to the small share of the total impact of apparel production that fibre production constitutes.

RQ3: Is the raw material for plastic addressed?

A majority of the strategies see the volume of fossil fuels used as raw material for plastic textiles as problematic because it makes the industry dependent on a non-renewable, non-biodegradable material, that may potentially run out. They do, however, differ in the propositions for alternative raw materials. The type of source that is seen as a solution reflects how strictly they define what is a “sustainable solution” for synthetic materials, and particularly for the “short term”. Industry goals are to increase the share of rPET, based on preferred fibres and HIGG MSI. The strategies discuss the solutions in this way:

1. rPET

The brands and industry organisations highlight their commitments to increasing the share of recycled material in their products, and their progress towards this goal. TE, in particular, emphasise the importance of the brands' commitment to their Recycled Polyester Challenge, which inevitably means rPET, given the current recycling technology. Here public policy makers nuance the picture by that the environmental savings depend on the production process, and that the raw materials for the rPET come from sorted PET bottles and are therefore taken out of a closed-loop recycling system.

2. Textile-to-textile

Textile-to-textile recycling is a clear goal for most of the strategies – it is the desired solution but a difficult one for many reasons: lack of knowledge of textile waste, lacking technology, fibre mixes, unknown chemical content, etc. or even scale – that the infrastructure and facilities have not been built and scaled to fit the industry. The industry further argues that rPET delivers on data, in comparison to other fibres, and the pursuit of textile-to-textile recycled polyester follows this logic. TE explain that in the future they envision, textile-to-textile recycling is being scaled up to meet the growing demand for sustainable feedstock, possibly allowing for continued growth.

3. Biosynthetics and from the air

Innovation of new fibres and materials are mentioned by many of the strategies in a general manner and speak of bio-based materials and extracting carbon from the air as potential solutions. One strategy focuses, in particular, on upscaling the use of bio-fibre and bio-plastic production while another questions the belief in bio-based synthetic fibres as environmentally friendly alternatives if they compete with food production in terms of land use and depend on heavy chemical or water usage.

However, the strategies also question whether these solutions are as good as virgin materials, stating that there is insufficient knowledge about shedding rates of recycled polyester and that recycled materials may lower product quality related to product needs and durability.

RQ4: Is the plastic waste problem addressed?

We understand this question as how the synthetic fibres will or will not end up as plastic waste both through shedding and at the end of life. There are large differences in how the strategies understand the problem, where the major focus is on microfibre shedding in use. In general, clothing waste is seen as a problem, and some see that “clothing mountains” and deserts are also problematic, but this is not directly connected to the plastic waste created in these situations. Therefore, most of the strategies address this issue only to some extent, through reduction of waste (e.g., microfibre filters, chemical issues and collection for recycling), or plastic waste is addressed but not plastic fibre waste. But, none of the strategies goes to the core of the issue: reducing the use of synthetic fibres or other solutions that tackle both problems and that do not create new ones. The solutions proposed are related to:

1. Sorting, re-use and recycling

To limit the amount of textile waste, or revalorise it, the majority of the strategies propose improving infrastructure for sorting textile waste for re-use and recycling.

2. Filters and pre-washing

The different strategies focus on reducing micro-plastic pollution by collecting the fibres being shed, both before sale and during the use phase (with the help of the consumer), namely indirect ways to hinder microfibre shedding. The propositions include washing machine filters and efforts to design yarns and fabrics, investigate production processes and provide customers with laundry bags. There are several important measures here, but their common denominator is that their potential impact is too small compared to the increased use of synthetic fibres, and the fibres shed during use ending up as house dust and in the air, will not be affected.

3. Export restrictions

Only one strategy received a Yes to our question because it goes to the root of the issue by proposing restrictions on the export of textile waste to non-OECD countries unless they notify explicitly that they are willing to import specific types of waste and also are able to manage the imports sustainably.

Furthermore, several strategies point out that more knowledge is needed to be able to make good decisions about measures. In particular, they cite lacking knowledge on microfibre shedding and health and environmental impact, and as a consequence what can be done to limit these effects in production and use. Again, this focuses on symptoms rather than underlying causes of the synthetic textile waste problem.

5. Conclusions

Our concluding chapter consists of two parts; first a text and visualisation of how the proposed measures do not address the main issues; second, a summary of the undiscussed assumptions that lay within the strategies' way of thinking. These are theories of causation that form the premiss for the intended environmental effects of the strategies and we call for research, or at least a discussion about the validity of these hypotheses.

5.1 Measures in the wrong place

Examining clothing consumption from a systemic perspective can help identify causal loops and leverage points, points to intervene within the system (Meadows, 1999), and compare the various proposed measures in terms of their potential effect on the system. This can be illustrated by a causal loop diagram (Bala et al., 2017).

The causal loop diagram on the next page (Figure 6-1) shows where in the system we (SIFO) would propose measures to decrease the environmental impacts of clothing production – directly aimed at reducing production. This is in opposition to public policy, here exemplified by the EU Strategy and the strategies of one of the brands/businesses. It illustrates how the proposed measures in the strategies examined are aimed at products instead of the system and consumers instead of production. This is based on a set of assumptions, also shown on the diagram.

Neither the industry nor most of the public policymakers seem to be ready to talk about the elephant in the room based on their strategy documents. From our point of view, most strategies are strikingly similar: they are dominated by a belief that improvements on a product level will solve the challenges we are facing. This is despite the fact that this strategy has failed, as the growth has eaten up any gains from product improvements. In other words, absolute decoupling is still a hypothesis and not a verified theory. If growth is understood as a problem in the strategies, it is as growth in consumption or in waste – and not as growth in production. The above comments on the strategies are in line with previous critiques of environmental work in fashion (Fletcher & Tham, 2019; Machek et al., 2020; Payne & Mellick, 2022), the growth paradigm (Hickel & Kallis, 2020; Jackson & Victor, 2019). and calls to support sufficiency within the circular economy (Bocken et al., 2022). A recent study of sustainable initiatives and green marketing shows that they likely have the opposite effect than intended due to a psychological rebound effect - reducing consumer guilt and unease, through this, furthering increased consumption (Olson, 2022). The same effect was found in a study of consumer fibre preferences (Sigaard & Laitala, 2023).

This lack of systemic approaches when facing the environmental challenges is most striking in the EU Textile Strategy because it has great ambitions. Of all the strategies, it is the Danish that goes the furthest in addressing the elephant. It is probably a result of it being born out of a collaboration between researchers and not solely industry and bureaucracy. This speaks in favour of including other stakeholders than the industry itself and their organisations when new policy is being developed.

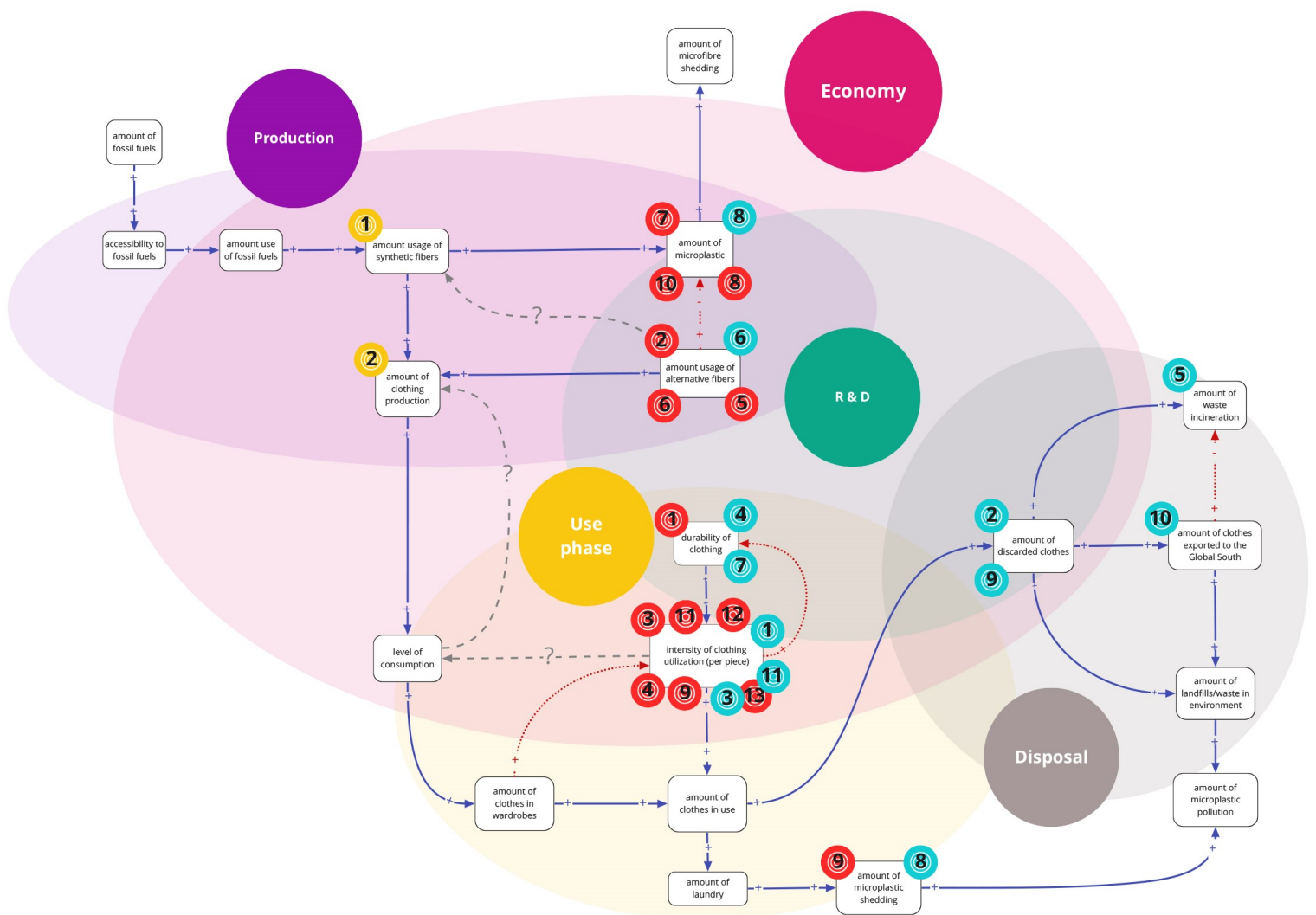


Figure 5 Causal loop diagram: proposed leverage points vs. strategy measures.¹
 Developed with System Mapping Academy (no date) based on Wright and Meadows (2009). © Lea Gleisberg 2022s

The majority of the proposed measures do not touch upon volumes, but rather the durability of products. There is, however, no point in extending durability or even the product lifetimes if the production volumes are not reduced. We are already in a situation where so much is being produced that the utilisation of each garment is decreasing. The strategies will therefore not contribute to a reduction in environmental impacts, on the contrary, they will most likely increase them. More durable clothing with reduced use time means an increase in unused potential.

¹ Causal loop diagrams help to understand a system, find leverage points and reveal the patterns that underlie the problems that are produced by the system. They can also be used to visualise causal loops - how the different parts of a system are interconnected and influence each other.

The blue arrows stand for both: the more the more or the less the less (+ + , - -).

The red arrows stand for both: the more the less or the less the more (+ - , - +).

The arrows are given a symbol (+ or -) for how the system “behaves” at the moment. For example: the higher the usage of synthetic fibres, the higher the amount of clothing production. That also means in turn: the lower the usage of synthetic fibres, the less the amount of clothing production.

The grey arrows with a question mark stand for causalities that are based on assumptions that have not been verified or proven. As systems are so complex, causal loop diagrams focus on a particular pattern or message that the map should communicate.

SIFO

- 1 reduce percentage of synthetic fibers (plastic) in clothing
- 2 reduce the total amount of clothing production (in kg)

EU Strategy

- 1 taxation measures to support the reuse and repair sector
- 2 proposal for the EPR
- 3 transparency obligation to disclose the number of products that companies discard and destroy
- 4 New EU rules that will ensure information at point of sale about commercial guarantee of durability
- 5 bans on the destruction of unsold products
- 6 bio-based innovations
- 7 eco-design strategies
- 8 a set of prevention and reduction measures
- 9 preparing for reuse and recycling of waste
- 10 addressing the challenges from the export of textile waste through EoL waste measures
- 11 guidance promoting circular business models

Brand/Business

- 1 product durability and longer use
- 2 increase use of recycled and more sustainable fibres
- 3 more circular business model
- 4 reuse, resell and recycle options
- 5 (small) initiative to minimize the use of plastic in denim jeans
- 6 develop technologies to enable reuse and recycling
- 7 Design yarns and fabrics to minimize microfibre shedding and seek alternative materials
- 8 investigate new production processes and requirements to minimize shedding (during production phase)
- 9 provide customers with repair services and microfibre-reducing laundry bags
- 10 support the development of laundry machine filter systems
- 11 develop technologies to enable reuse and recycling
- 12 developed collection for returned garments/old fabric
- 13 enabled customers to purchase renewed, previously damaged, garments

Figure 6 Details of leverage points and strategy measures in Figure 5.

Instead of discussing production growth, the strategies put forward measures based on unverified theories of connections between durability, lifetime and environmental impact. There is a lot we do not know, but there is significant consensus that radical change is urgent in order to prevent catastrophic consequences for the living conditions of humans and other animals, fish and birds.

In such a situation, we do not think it is appropriate to put all our bets on measures without verified effect. We, therefore, need to examine the premises for current strategies, but more than anything, make the case for using the knowledge we *actually* have and build strategies going forward on the basis of measures we know work. This will be in line with the “Earth Logic: Fashion Action Research Plan” (Fletcher & Tham, 2019) and the “Wellbeing Wardrobe: A wellbeing economy for the fashion and textile sector” (Sharpe et al., 2022).

5.2 The strategies build on a series of hypotheses

There are several hypotheses that form the premiss for most of the strategies:

1. The transition to “sustainable materials” will lead to large reductions in environmental impacts

This hypothesis is important both for the industry and for public policymakers. It is the basis for labelling schemes and rating tools (Higg Index, PEF etc.). It presumes a number of conditions, such as there being large differences between products, that reliable and comparable knowledge about materials exists. It also presumes that indexes and labelling schemes will not have unintended consequences that affect the volume that is being *sold, despite research stating the opposite (Olson, 2022). The LCA data used for these tools are old, not very representative and not fit for making comparisons (Kassatly & Baumann-Pauly, 2022).*

The Norwegian Consumer Authority (NCA)’s, decision that Norrøna is in breach of marketing regulations by its use of Higg data also points out that the data is not connected with the specific product marketed and does not show significant differences in environmental impact.² When, in addition, studies show that the fibre choice itself amounts to only a small proportion of environmental impacts and that none of the comparative tools includes the specific plastic-related issues (microplastics, the lack of biodegradability and renewability) and therefore the problems that plastic pellet trade, etc. create, it is evident to us that this hypothesis falls short.

2. Changes in products lead to systemic change

More durable apparel, longer lifetimes or reuse do not “save the environment”. It is in itself positive, but only if fewer clothes are being produced. When the focus on lifetime increases, in the form of more durable clothes or repairs, it is urgent to produce knowledge about the conditions under which this leads to the consumer acquiring fewer new clothes. In other words, how the potential increases in lifetime can have an effect on the environmental impacts, and for which types of apparel and consumers this applies.

The way changes on the product level are thought to influence the system is through the actions of consumers. It is of course possible, *even likely*, that the consumers will change their behaviour, but only *over time*. It is also likely that this change in consumer practices is too slow for the rapid change we need. As already mentioned, the systems in itself, with the labelling of some products as better than others, will have the opposite impact.

This hypothesis is also based on the assumption that fast fashion is bad quality clothing, whereas it is a business model based on speed and large volumes of cheap clothes, some which are also very durable. Therefore, instead of developing measures that do not affect the system or the

² Read the NCA’s decision [here](#) and the following guidance on environmental claims to the textile industry [here](#).

problem directly, it is now time to develop policies that have the need for systemic change as their starting point and not the design of single products.

3. New business models will lower environmental impacts

The environmental gains from new business models have not been sufficiently examined (Johnson & Plepys, 2021; Maldini et al., 2019). This concerns the whole range of business models directed at prolonging lifetimes, such as repair, rental, re-use etc. The studies that do exist show very different results depending on a variety of factors (e.g., Gray et al., 2022; Johnson, 2020; Johnson & Plepys, 2021; Zamani et al., 2017). Yes, it is important that the industry is encouraged to evolve, but if we are to reduce the environmental impacts, measures with a higher probability of success should be prioritised. All the mentioned business models would on the other hand become important (and profitable) if clothing production volumes were reduced.

4. Changes in demand will influence production

The relationship between what is bought and what is produced is very complex for apparel. This is due to the fact that the collections commonly are produced long before they hit the market. They are therefore not produced on the basis of demand but on estimates for what will be sold. As long as the industry (or public policy makers) do not have a plan for reducing production, it is therefore difficult to see how the demand can influence production, in the current set-up, where production of garments and footwear is based on the projected sale of these that often no longer are in production at the time of sale. Knowledge is therefore needed about this relationship and how it is possible to reach a system with less overproduction, understood as deadstock (including apparel sold at heavily reduced prices, dumped in the second-hand system, or stored unused in wardrobes) that ends up as discarded useable apparel.

5. Sustainable synthetic fibres are possible

We have less control over synthetic fibres than other plastics. This is because they both shed in use, are exported to other countries without proper waste management and that they to a large extent are mixed with natural materials and problematic chemicals. How they simultaneously can be labelled as “sustainable” is difficult to understand. It is evident that they could be produced in a better way, e.g., so that they shed less during use, or be made from other raw materials. These kinds of alterations will not change the fundamental issue that we do not have control over synthetic textiles. None of the solutions that are being discussed for synthetic fibres solves the upstream and downstream issues simultaneously because these fibres’ low price is the condition for growth in the sector.

6. Decoupling - and therefore green growth - is possible

Absolute decoupling, of not just economic growth and environmental impacts but also of increased production and environmental impacts is so far not backed by empirical evidence. There is some evidence of relative decoupling and therefore of stagnation of increase in impacts or resource use. A much larger decrease in impacts, through absolute decoupling, is needed for continual economic growth to be possible. Still – as we have shown – this forms the backbone of the environmental strategies we have examined.

Instead, we propose to turn around these assumptions for more impactful policies: lowering the amount of apparel produced will increase the durability of apparel because it will be better taken

care of. The apparel lifetimes will then be longer, and repair and other business models connected to longer use or more users will be more profitable. With fewer clothes, consumers will be more interested in buying apparel they really like from brands supporting them with good information on both the possible duration of the products and their use-related performance. Less synthetics, meaning less apparel produced in synthetic fibres or a lower percentage of synthetics in apparel produced, will in itself contribute to less apparel being produced. To work politically towards less apparel and plastic is therefore both an easier and more targeted strategy. In the proposal for targeted producer responsibility (TPR), we have shown how this can be done for example as a part of a producer responsibility scheme (Klepp, Måge, et al., 2022). The same system can be used related to PEF, ESPR and so on. An important change is not to focus on each garment but on how long the company's products are used on average.

The analyses for this report were conducted between March and June 2022, based on the most recent documents available documents. However, a lot is happening in the field of clothing and textiles. We can see an emerging will to face the elephant and hope the discussion around sustainability will mature, be more based on research and less on assumption in the near future.

References

See full report.

Consumption Research Norway (SIFO) is a non-profit, transdisciplinary research institute at OsloMet – Oslo Metropolitan University. SIFOs research aims to understand the role of consumption and consumers in society and to provide the knowledge basis for public consumer policy in Norway.

SIFO's core research areas are:

- Sustainable consumption, centering on environmental impacts of consumption and consumers' participation in a green transition.
- Market based welfare, focusing on financialization processes, consumer debt and non-state procurement of welfare services.
- Technology and digitalization, looking at consumption of and through digital media.
- Clothing and textiles, looking at consumption history and culture, procurement processes and consumption practices related to these product groups.
- Food, nutrition and food culture.