Resizing Fashion

Reshaping the global fibre market

Key Messages

- Synthetic textiles made from fossil fuel inputs, that are turned into fibres and woven into fabrics, are the most dominant in the textiles market today.
- The availability of cheap fossil fuel inputs has led to an explosion in the volumes of textiles produced and consumed.
- While no single fibre is inherently sustainable on a product-to-product basis, the system-level picture is different: synthetics make up the majority of global textile volume and are therefore the primary engine of overproduction.
- The low cost and scalability of synthetic fibres lock the industry into high-volume, high-turnover models. Unless the relative price and availability of synthetic fibres is addressed directly, textile volumes and associated environmental impacts will continue to grow.
- Downstream interventions like recycling solely react to the symptoms and are inadequate for dealing with the scale of the problem.
- Policies which focus on physical durability of garments are high on the policy agenda, but risk favouring the use of synthetic fibres, resulting in adverse environmental outcomes- both in terms of plastic pollution and climate mitigation.

Policy Recommendations

- Explore the use of waste export bans to address the plastic pollution resulting from synthetic garments.
- Reform Environmental Footprinting and Life Cycle Assessment tools to better capture the human health, full life cycle (chemical hazards, microplastic and plastic pollution) and system impacts of synthetic fibres.
- Use eco-modulated fees within Extended Producer Responsibility schemes to disincentivise the mass production of synthetic based garments.
- Use fiscal policy to internalise the externalities associated with fossil fuel inputs.
- Prohibit new investment in petrochemical infrastructure for synthetic fibre production.
- Push for governance in international climate negotiations towards complete phase out of fossil fuels, closing loopholes that currently exist for the petrochemicals and textiles sector.

Current Status and Trends

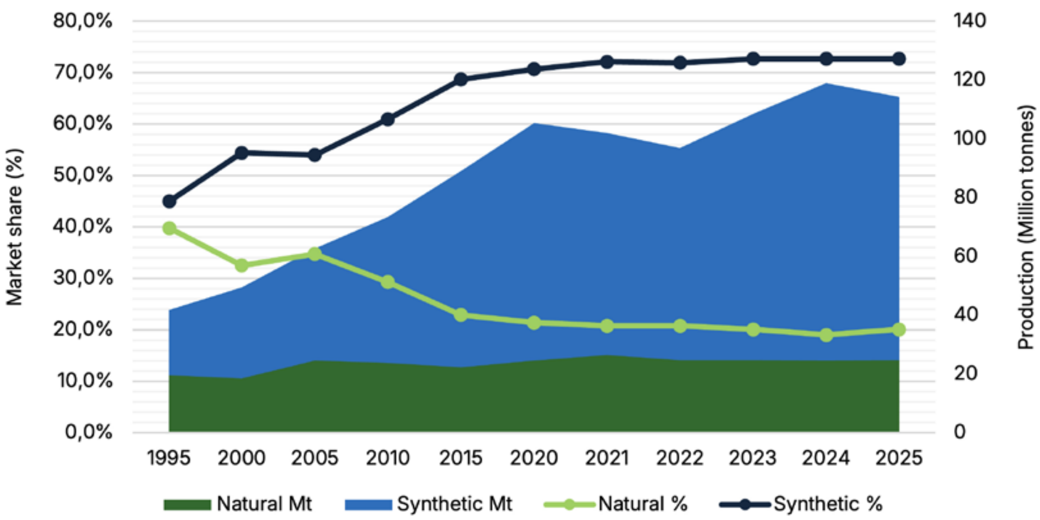
The vast increase in textile production volumes since the early 2000s and the emergence of the fast fashion business model strongly correlates with the availability of cheap fossil fuel inputs and the growth in synthetic fibre production.

In the mid-1990s synthetic fibres overtook cotton and have since remained dominant in the fibre market (Textile Exchange, 2025). Between 1975 and 2019 the synthetic market grew ninefold and in 2024 synthetics made up 73% of the global textile fibre production. Polyester is the most used synthetic fibre, amounting to 59% of global fibre production. (Textile Exchange, 2025) Industry forecasts suggest demand for synthetic fibres could grow by around 7% per year this decade, potentially increasing the market value by more than 60% by 2030 (Grand View Research, 2023).

Synthetic fibres such as polyester, polyamide, acrylic, elastane and polypropylene, predominantly use crude oil as main raw material input but can also be made from coal.

Synthetic fibres are much cheaper to produce than natural alternatives. Polyester, the dominant synthetic fibre, costs half as much per kilo as cotton (Changing Markets Foundation, 2021), while silk costs 67 times more (Kassatly, 2022).

Comparison between Natural and Synthetic Fibres



Source: World Bank, Textile Exchange (2025)

Impacts of growing synthetic fibre use

Wellbeing Impacts:

- Owing to their fossil fuel inputs, textiles are the leading cause of microplastics shedding (EEA, 2021). There is a growing scientific evidence base that shows synthetic fibres dislodged from clothing are contributing to chronic inflammation, which is known to be a leading cause of diseases such as cancer, heart disease, asthma, and diabetes (Plastic Soup Foundation, 2022).
- Moreover, there are human health impacts associated with the use of PFAS and other hazardous chemicals that are used in synthetic textiles to impart desirable properties like water and stain resistance to materials such as polyester and nylon (EEA, 2024; Olga et al., 2021; Directorate-General for Environment (European Commission) et al., 2026).
- Studies indicate that PFAS exposure is confidently associated with several human health impacts, including respiratory infections, autoimmune thyroid disease, liver disorders, reproductive issues such as reduced sperm count and mobility, and maternal–neonatal risks such as gestational hypertension, decreased foetal growth, and low birth weight (Directorate-General for Environment (European Commission) et al., 2026).

Environmental Impacts:

- The production of synthetic fibres requires large amounts of energy and is a significant contributor to climate change along with the depletion of non-renewable fossil fuel resources (EEA, 2022b).
- A comparative assessment of different fibres is challenging owing to different fibres driving different environmental impacts. Synthetics, for example, present significant challenges in terms of climate change and pollution, while natural fibres like cotton have significant impacts on land-use and biogeochemical flows (EEA, 2021).
- The main challenge with synthetic fibres is that their low cost and widespread availability have allowed for an explosion in production and consumption volumes - which is the key driver of environmental impacts across the fashion sector (Klepp et al., 2023).
- Textile consumption in the EU, in 2020, had the 4th highest impact on the environment and climate change from a global life cycle perspective, after food, housing, and mobility (EEA, 2022b).
- Synthetic fibres are non-biodegradable and non-renewable thus remain in the environment for up to 200 years before fully decomposing, having significant impacts on marine and land ecosystems (Changing Markets Foundation, 2021).
- A large share of textile waste is exported to countries with limited waste management infrastructure. In this context, synthetic garments pose significant pollution problems as microplastics and toxic chemicals from end-of-life garments leach into soil and waterways, polluting land and marine ecosystems (EEA, 2022a; Kounina et al., 2024).

What is driving the trends?

Unpacking structural lock-ins: The Stable Input
Together with domain experts we mapped two key reinforcing dynamics (as shown in Figure 1) which explain the trends and impacts observed in relation to synthetic fibres and overproduction.

As demonstrated by R1, owing to the low **price** of fossil fuel inputs, synthetic fibres are much cheaper to produce than animal or plant fibre alternatives. Polyester, the dominant synthetic fibre, costs half as much per kilo as cotton (Changing Markets Foundation, 2021), while silk costs 67 times more (Kassatly, 2022). This has led to an increase in **synthetic fibre production** and has significantly lowered **production costs**, resulting in high- **production volumes** of garments and low **retail prices** for consumers (R1 Figure 1). Overtime this has led to the market dominance of business models based on cheap and fast production, which in turn has further driven the demand for low-cost inputs. As demand for synthetic fibres has grown, the industry has benefited from further economies of scale allowing synthetic fibres to become increasingly cost competitive. Moreover, unlike natural fibres, synthetic fibres are not subject to climatic disruptions and agricultural cycles and are thus a consistent and scalable feedstock for the sector. Because they are created via industrial processes from widely available fossil fuels sources, synthetic fibres also offer more uniform quality (SN, 2025). This has led to shorter lead times and increased the speed of production across the industry, which further contributes to increased production volumes (R2 Figure 1).

As the energy sector shifts toward renewables, the **availability** of fossil fuels for other industries is growing. Petrochemicals for textile production are becoming an increasingly important output and revenue stream for the global fossil fuel industry. This in turn drives the growth in synthetic fibre production deepening structural lock-ins between the two sectors (IEA, 2018; Tilsted et al., 2023).

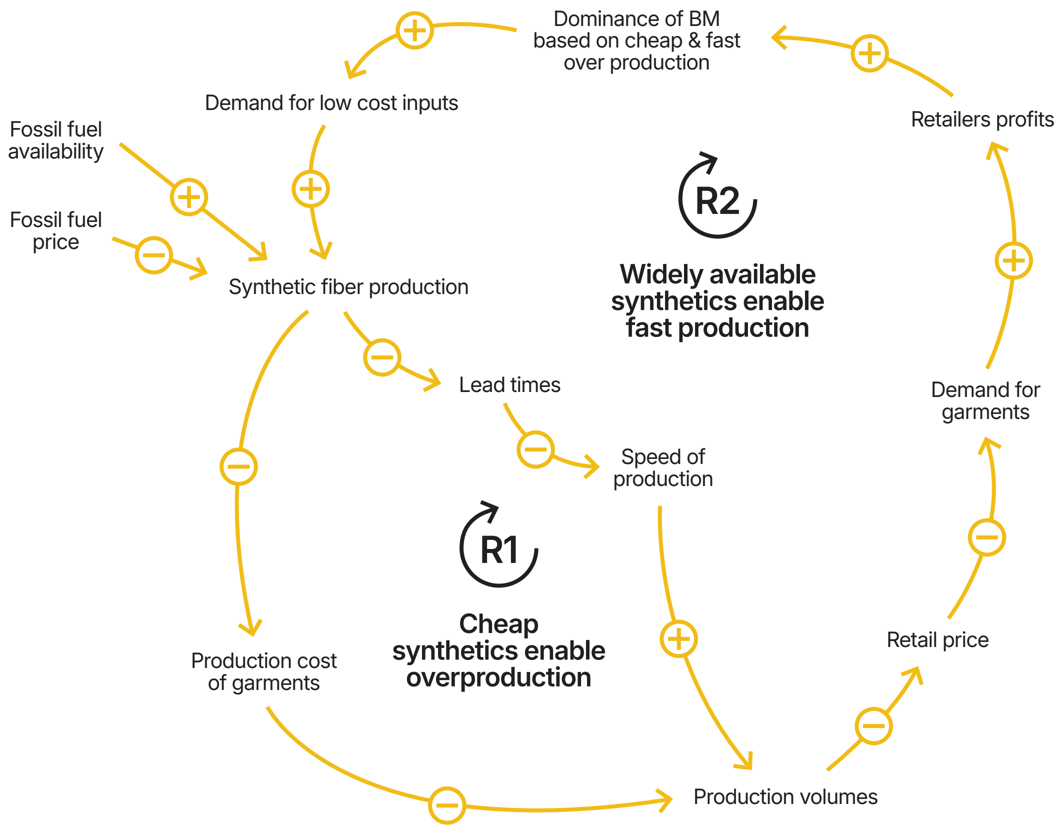


Figure 1. The Stable Input: Systemic Mapping of synthetic fibres and overproduction

A causal loop diagram defines the relationship between different parts of the system. In this diagram, "+" arrows indicate that two variables move in the same direction. In contrast, "-" arrows indicate that two variables move in opposite directions.

Reinforcing Loop (R): A reinforcing loop is a feedback loop that amplifies change. Whatever direction the system is moving—growth or decline—it will continue accelerating in that same direction becoming a systemic lock-in.

Current Progress in Fashion Policy

GAPS AND CHALLENGES

Recycling – False Friends

Despite its prominence on the policy agenda, recycling functions as a symptomatic solution, aiming to ameliorate the visible textile waste problem without addressing its root cause: overproduction. Garments made from fossil fuel fibres are very challenging to recycle due to often being blended with other fibres (e.g. polycotton or polyester and wool). Overall, fibre-to-fibre recycling represents less than 1% of the global fibre market. Most recycled polyester fibre is currently coming from PET bottles (98%) (Textile Exchange, 2025). Despite significant investment, the share of recycled polyester decreased from 13.6% in 2022 to 12% in 2024, owing to the growth in virgin polyester production (Textile Exchange, 2025).

Polyester from PET bottles also represents a form of downcycling, as after a few cycles, the fibres degrade and usually end up as waste or energy recovery, not a closed loop. For polyester, cotton and wool recycling a significant share of virgin material is usually needed to maintain fibre quality and durability. This means virgin resources will still be required at current production volumes, driving further environmental impacts (EEA, 2019).

Ultimately, recycling of fibres is a reactive approach and contributes very little to address the underlying incentives within the global fibre market highlighted in Figure 1 which are driving overproduction and environmental impacts; as such, policy focus in this area is misplaced. Over time, this can actually worsen the core problem by legitimising continued high-volume production under the guise of circularity.

In systems thinking, focussing on textile recycling can be seen as a **"false friend"**. Recycling appears to offer a circular, low-impact solution, yet in practice it can reinforces the very problems it aims to solve. The promise of recycling creates the illusion that high volumes can be sustainably absorbed. This reduces pressure for deeper interventions which address overall volumes, allowing the underlying environmental impacts to persist.

Durability and Eco-Design standards – A fix that Fails

Under the Sustainable and Circular Textiles Strategy there is a strong focus on increasing the durability of garments to increase product lifetimes. However, there is no empirical evidence to suggest that increasing product lifetime alone, results in reduced environmental impacts. Any environmental benefits from product lifetime extension hinge on reduction in demand and overall production volumes due to delayed replacement rates or avoided purchases by consumers (Maldini et al., 2025).

Wardrobe studies show that less than 4% of clothing is discarded to replace non-functional garments (Maldini, 2019). In this context, increasing product durability will have limited environmental benefits unless overall production volumes are addressed.

Depending on how physical durability is assessed, there is also a risk that a focus on durability may unintentionally incentivise a further shift towards the use of synthetic fibres. This is because synthetic fibres tend to be stronger, more resistant to wrinkles, shrinking, and fading. They are also considered to be easier to maintain than the other fibres due to anti-pilling technologies and hydrophobic coatings (En mode climat, 2022; Klepp et al., 2023). By falsely equating durability with sustainability policy makers could unintentionally cause a further shift towards synthetics and increased production volumes (as shown in R1), driving further environmental and social impacts.

4%

Wardrobe studies show that less than 4% of clothing is discarded to replace non-functional garments (Maldini, 2019).

Product lifetime extension refers to strategies that make garments *physically last longer*, such as improving durability, repairability, and material quality. In contrast, **product service lifetime** focuses on how long a garment is *actually used* before being discarded, which is influenced by cultural norms, marketing and advertising practices and business models of fashion brands.

Effective policy design needs to encourage longer use by also addressing the fashion marketing and advertising landscape (See Policy Briefs 3 and 4).

In Systems Thinking a **"Fix That Fails"** pattern occurs when a policy or intervention solves a problem in the short term but **triggers unintended consequences** that make the original problem worse over time. These fixes rely on symptomatic solutions that treat immediate issues rather than underlying causes

A Transformative Policy Framework

The Iceberg Model illustrates that the most influential drivers of fashion's impacts lie beneath the surface in the system's structures and mental models. Addressing these root causes requires policies that go beyond symptom-focused measures (REACT and ANTICIPATE) and instead target the incentives, power structures and mental models outlined in Figure 1 which lock in overproduction and overconsumption (REDESIGN and DISRUPT).

While REACT and ANTICIPATE measures alone cannot transform the system, they nonetheless can serve an important role within the policy mix, particularly in the short run, while the deeper structural and cultural changes needed for long-term transformation are being developed. That said, policy makers must not delay action and need to act with urgency to ensure that transformative measures (REDESIGN and DISRUPT) are included within the policy mix. Without them, incremental improvements will be consistently outpaced by the growth in production, consumption, and environmental pressure.

The next section presents a non-exhaustive analysis of policies operating at various levels of transformation and, where appropriate, provides recommendations on how to adapt existing processes to support effective implementation.

REACT

> **Fixes immediate harms with enforcement and technical adjustments that keep the system running without shifting trends.**

Banning Export of Textile Waste: Synthetic textiles are plastics, yet EU waste law still treats them separately from other high-risk plastic waste streams. Explicitly classifying mixed-fibre and synthetic textile waste as high-risk plastics would trigger their inclusion in the EU's non-OECD plastic waste export bans and help to mitigate the dumping of low-value synthetic garments in countries with insufficient waste-management capacity. To close existing loopholes, the Commission should also establish strict EU-wide criteria for distinguishing genuinely reusable textiles from textile waste so that low-quality synthetic items can no longer be exported under the guise of "used clothing'. This measure is important to deal with the immediate symptom of the oversized fashion system, but it does not change the production volumes, business models, or material choices that create the waste in the first place.

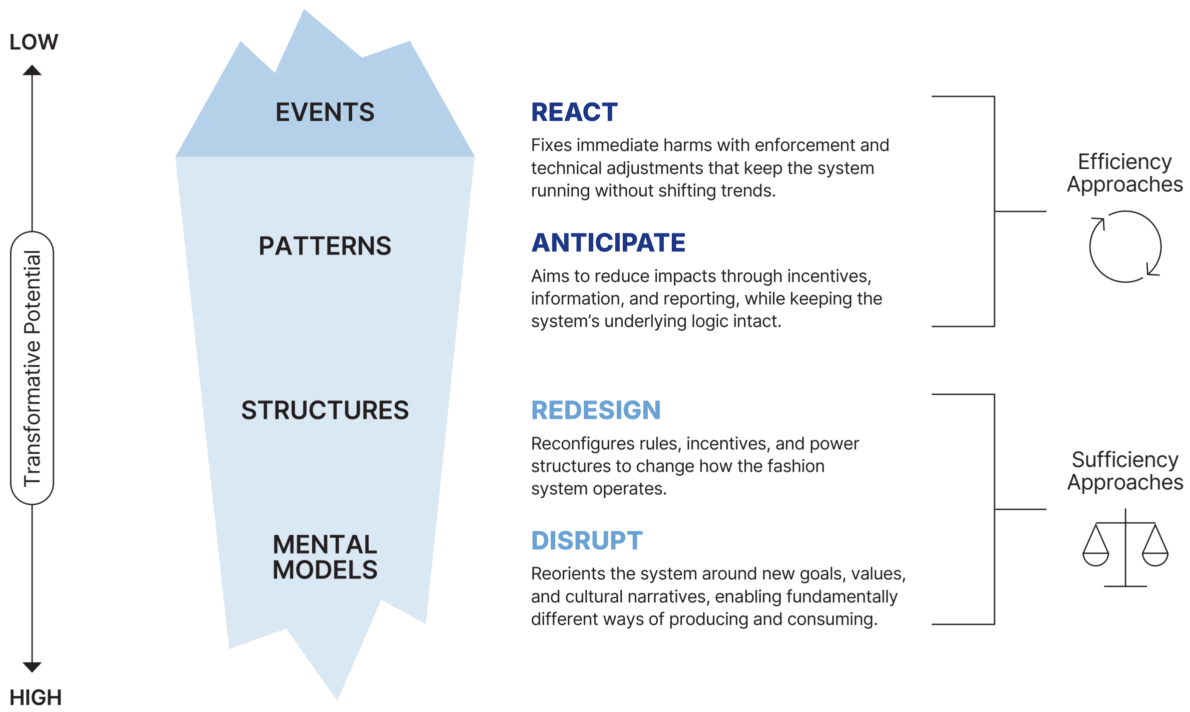


Figure 2. The Iceberg Model: A Systems Approach for Policy Making based on Donella Meadows leverage framework. (Hot or Cool)

ANTICIPATE

Aims to reduce impacts through incentives, information, and reporting, while keeping the system's underlying logic intact.

Product Environmental Footprints: Life Cycle Assessment (LCA) calculations on the impacts of different fibres, provide the evidence base and incentives for many environmental policies, in particular eco-design criteria. To date, the methodologies used to calculate impacts, such as the Higgs MSCI and the EU's Product Environmental Footprint Category Rules tool and France's Footprint Tool are underestimating the environmental impacts of synthetic fibres. (Kassatly, 2022; Payne & Mellick, 2022). These methodologies consistently favour synthetic garments, labelling them as the most sustainable because they assess impacts on a product basis and do not account for post-consumer impacts such as microplastic shedding and plastic pollution. This urgently needs to be addressed to account for the systemic role that synthetics play in driving overproduction (Kassatly & Townsend, 2024). If not, there is a risk that well intentioned environmental policies could actually reinforce overproduction.

Extended Producer Responsibility: Extended Producer Responsibility (EPR) for textiles forms the cornerstone of the EUs Strategy for Circular and Sustainable Textiles. Helping to make producers responsible for the costs of managing and developing the infrastructure for the growing mountain of garment waste. Eco-modulating fees (varying fees in terms of environmental performance) are an important aspect of EPR schemes to ensure that the schemes incentivise changes in product design and production decisions to prevent and avoid waste volumes, in line with the waste hierarchy.

There is a significant opportunity to eco-modulate fees to ensure that synthetic fibres are priced in a way that is reflective of their true environmental and social costs. As shown by Figure 1 this would help to slow down the fast fashion machine and reduce overproduction of garments.

Emissions Trading Schemes: Similarly expanding the EU's Carbon Border Adjustment Mechanism (CBAM) to cover plastics and chemicals would also help to align the price of imported synthetic garments with their actual environmental costs.

While interventions like EPR and CBAM aim to manage fashion's impacts through fees, these measures will not shift the system's high-volume business model unless the fees are set high enough to meaningfully influence production decisions and business models.

The results from a modelling scenario for an EPR scheme in Norway with a 30% surcharge on synthetic textiles, shows reduced consumption (about **1–1.5%**) by raising prices modestly, shifting purchases toward other goods and services. It lowers demand for synthetic fibres more than for natural ones and generates EPR revenue for waste and repair systems. While textile imports and retail activity contract slightly, overall economic activity and employment rise due to spending shifts and development of circular economy activities (SINTEF, 2025).

REDESIGN

> Reconfigures rules, incentives, and power structures to change how the fashion system operates.

Taxing at source: Unlike EPR and CBAM fees, taxing polymers at source would change the feasibility of the high-volume business models as it challenges the input that makes them possible (cheap and abundant synthetics). Proposals have been put forward by The Minderoo Foundation and Ghanaian government for a Polymer Premium under the Global Plastics Treaty negotiations (Minerdoo Foundation, 2024). Taxing polymer producers who provide the inputs from the petrochemical sector would allow for the internalising of externalities associated with synthetics, increasing production costs of garments and thus directly impacting production volumes. While also creating funds to support a more sustainable fashion ecosystem. Given the market share of polyester, which is derived from polyethylene terephthalate (PET), this should be the priority target polymer.

Ending subsidies: Global fossil fuel subsidies are at roughly the same levels today as immediately after the 2009 G20 commitment to reform such subsidies (IEA, 2024). In 2022 fossil fuel subsidies in the EU more than doubled following COVID and Russia's Invasion of Ukraine (EEA, 2025). These subsidies extend through value chains, lowering the overall costs of fossil fuel inputs, which in turn benefits petrochemical production and wider garment production (Tilsted et al, 2023). Phasing out these subsidies would help ensure that the price of fossil fuel inputs and the production costs of garments more accurately reflect their true costs. (Maldini et al., 2025).

Redirecting investment: Another key measure would be to halt all international public financing for the expansion of petrochemical infrastructures that do not support the fashion industry's transition to a fossil free future. Doing so changes the underlying economic conditions that make cheap synthetics and therefore high-volume fashion possible. Compared to private financers, public financial institutions can redirect funds to low-carbon projects as they are able to prioritise long-term goals over immediate profits (Tilsted, 2023).

DISRUPT

> Reorients the system around new goals, values, and cultural narratives, enabling fundamentally different ways of producing and consuming.

Shifting Paradigms: Ending our addiction to Fossil Fuels
Ultimately, while fossil fuels inputs remain cheap and widely available, they will continue to drive unsustainable production and consumption volumes of garments. As our energy systems decarbonise, a huge loophole exists for the fossil fuel industry in terms of redirecting fossil fuels towards the petrochemicals industry to produce plastics, textiles, and detergents (Tilsted et al., 2023). Given the globalised nature of the fossil fuel industry, systemic global solutions are also needed. The EU and member states should use their position to advocate for a paradigm shift in climate governance.

International climate negotiations must widen their scope, beyond the 'transition away from fossil fuels in energy systems', towards preventing all new projects for the exploration and extraction of any coal, oil or natural gas reserves (IISD, 2024). New policy instruments such as a Fossil Fuel Non-Proliferation Treaty, for example, have been proposed to allow for a managed decline of fossil fuel extraction (Tilsted et al., 2023).

> 'Fossil fuels are the greatest contributor to climate change. They are the slow-acting poison in the veins of our planet and economies.... We must end the addiction, including in the plastics industry, because business-as-usual growth in plastics would burn through up to 20 percent of the carbon budget for 1.5°C by 2040 – mainly from the production of primary polymers and conversion into products.'
>
> Inger Andersen, 2023

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