

Increasing Transparency in the Fashion Industry Supply Chain

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Executive Summary

The fashion industry is in dire need of revolution. Polluted waterways, reliance on fossil fuels, unsafe work environments, obscure supply chains, gender-based violence, and other atrocities are hidden behind the clothes we wear every day. Even more obscure is the huge amount of greenhouse gas emissions caused by the industry's long global supply chains. Supply chain emissions alone account for an overwhelming majority of the industry's carbon footprint, though the lack of transparency means emissions are likely much higher. The overproduction and reliance on fossil fuel-based fibers (e.g. polyester) not only increases industry emissions, but is causing air, land, and water pollution. The fashion industry depends on production and manufacturing in Asian countries, many of which source the majority of their power from fossil fuels (coal, oil, and gas). Limited renewable energy options, energy intensive materials, thermal heating requirements, and limited regulation have made it difficult to track or lower the fashion industry's emissions. Many fashion brands and companies use power purchase agreements (PPAs) and energy attribute certificates (EACs), such as renewable energy credits (RECs), to purchase renewable energy and lower their greenhouse gas emissions, but the effectiveness of PPAs and EACs is variable. Coalitions of companies, including fashion companies, have shown great success in increasing renewable energy in fossil fuel dependent countries (e.g. Vietnam) by advocating for direct PPA markets. Science-based targets that have been verified by the Science Based Targets initiative (SBTi) have also been shown to provide companies with a better understanding of how to decrease emissions to prevent global temperatures from exceeding 1.5°C. Greater transparency, regulation, consumer advocacy, and scrutiny from organizations and lawmakers is essential to decreasing industry emissions and shifting the fashion industry towards a circular economy, ultimately reducing the industry's impact on human rights and the environment.

Fashion Emissions

The Intergovernmental Panel on Climate Change (IPCC) is warning that fossil fuels need to be phased out to prevent global temperatures from exceeding 1.5°C. According to their latest report, global greenhouse gas emissions must be halved, and coal use must decrease by 75% by 2030 to avoid catastrophic climate change.¹ Under a business-as-usual scenario global temperatures are predicted to surpass the 1.5°C threshold of global temperature rise creating an unstable climate. Increasingly powerful storms, flooding, drought, wildfires, heatwaves, and other extreme weather events are already being experienced across the globe, wreaking havoc on already vulnerable populations. Global greenhouse gas emissions are increasing the frequency of extreme temperatures that will challenge the poor working conditions of the 40-60 million garment workers worldwide, of which 80% are women.²

While the data is incomplete, studies suggest that the fashion industry accounts for anywhere from 2%³ to 10%⁴ of global greenhouse gas (GHG) emissions. The true scale of the fashion industry's emissions is unknown due to a lack of transparency and reporting of supply chain energy use. The fashion industry supply chain, although complex and

¹ IPCC (2022) Climate Change 2022: Mitigation of Climate Change

² Gender discrimination. Clean Clothes Campaign. (2020, October 13). <https://cleanclothes.org/gender-discrimination>

³ WRI. 2020. "World Greenhouse Gas Emissions: 2016," February 3. <https://www.wri.org/data/world-greenhouse-gas-emissions-2016>

⁴ How much do our wardrobes cost to the environment? World Bank Group. (2019, October 8). <https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medio-ambiente>

nebulous, can be broken down into three main components: tier-one factories (e.g. production units, Cut Make Trim facilities, garment sewing, garment finishing, full package production, and packaging and storage), processing facilities (e.g. ginning and spinning, knitting, weaving, sub-contractors, dyeing and wet processing, tanneries, embroidering, printing, fabric finishing, dye-houses, laundries, etc.), and raw material suppliers (e.g. farms, slaughterhouses, sewing yarn suppliers, filament and staple, chemical suppliers, etc.). The 2021 Fashion Transparency Index (FTI) by Fashion Revolution found that of the 250 brands assessed 47% are disclosing their tier-one manufacturing facilities while less, 27%, disclose their wet processing facilities and spinning mills deeper in their supply chains, which are the most carbon-intensive processes (e.g. dyeing and finishing, yarn preparation, and fiber production).⁵ With respect to GHG emissions, 62% of brands are disclosing their carbon footprint at the owned facilities and operations level; where the head office and retail stores are located. Moving further down the supply chain, just 26% of brands publish their carbon footprint at the manufacturing/processing level—where the fabric is processed and transformed into garments. Finally, just 17% of the 250 brands included in the Index disclose their carbon footprint at the raw material level, despite this being where the most impact occurs. This highlights the correlation between brands' transparency on where their clothes are produced and how this visibility decreases the further down the supply chain you go, including the calculation and reporting on carbon emission.

Scope 3

Many big fashion brands and companies have announced ambitiously low GHG emissions targets, with promises of net zero emissions by 2050, but most fail to report or disclose their supply chain emissions. Total company emissions are separated into 3 categories: Scope 1, 2, and 3. Supply chain emissions fall under Scope 3, but targets or disclosures for Scope 3 are markedly absent from most fashion company climate pledges. Of the different emissions sources, Scope 3 emissions are the most difficult to calculate. The World Resource Institute and Apparel Impact Institute estimate that Scope 3 emissions account for over 96% of total GHG emissions of the average fashion company, of which 80% are due to the extraction, production, and transportation of goods and services purchased or acquired by the reporting company.⁶ The energy sources for production and manufacturing are highly dependent on the country the suppliers are located in. Some countries, like China, depend on national coal reserves to power their economies. Industry experts claim that coal accounts for an astonishing 75% of energy use in the fashion supply chain.⁷ Knowledge of coal use and the associated pollution and GHG emissions, should urge action from large companies, yet a recent study by CDP found that fewer than 38% of reported brands encourage their suppliers to act on climate change.⁸ Only 18% of brands included in the 2021 FTI published data on absolute energy reduction in the supply chain. Transparency on this is important as having access to this information is needed to reduce the industry's emissions.

Modern Fashion

The fashion industry is valued at an estimated 3 trillion USD annually, about 2 percent of the world's Gross Domestic Product.⁹ The global fiber market is dominated by polyester, a cheap crude oil based synthetic material, which accounted for 52% of the market in 2020.¹⁰ Polyester has the lowest production cost of any synthetic material and is now the most-used synthetic fiber worldwide. Polyester production increased from 20 million tonnes in 2000 to 60 million tonnes in 2018 and is expected to exceed 90 million tonnes by 2030.¹¹ It's estimated that in 2015, polyester production alone was responsible for over 700 million tonnes of carbon dioxide equivalent,¹² about the same annual greenhouse gas emissions of 180 coal-fired power plants. Additional research and a full life cycle assessment (LCA) of polyester is required to understand its current contribution to GHG emissions.

⁵ Fashion Revolution (2021) Fashion Transparency Index: 2021 Edition

⁶ Sadowski, M., L. Perkins, and E. McGarvey. 2021. "Roadmap to Net-Zero: Delivering Science-Based Targets in the Apparel Sector." Working Paper. Washington, DC: World Resources Institute. Available online at <https://doi.org/10.46830/wriwp.20.00004>.

⁷ WRI (2021) Roadmap to Net Zero: Delivering Science-Based Targets in the Apparel Sector
<https://www.wri.org/research/roadmap-net-zero-delivering-science-based-targets-apparel-sector>

⁸ CDP (2022) ENGAGING THE CHAIN: DRIVING SPEED AND SCALE CDP: Global Supply Chain Report 2021

⁹ Global Fashion Industry Statistics. (n.d.). <https://fashionunited.com/global-fashion-industry-statistics/>

¹⁰ Textile Exchange (2021) Preferred Fiber & Materials: Market Report 2021

¹¹ Changing Markets (2022) License to Greenwash

¹² Ellen MacArthur Foundation (2017) A new textiles economy

Synthetic fibers, made from crude oil and methane gas, such as polyester, polypropylene, nylon, acrylic, elastane, and others now account for more than 69% of all textile fibers and are projected to reach 73% of all materials used in textiles by 2030.¹³ To create polyester fibers, crude oil is refined and processed, releasing dozens of harmful chemicals including BTEX compounds (benzene, toluene, ethylbenzene, and xylene), particulate matter, nitrogen oxides (NO_x), sulfur dioxide (SO₂) and CO.¹⁴ These chemicals are not only dangerous to local communities but also contribute to global warming and air pollution as well. The production of polyester is an energy-intensive process and uses as much as 125 MJ/kg polyester fiber, while cotton on average requires 60 MJ/kg to produce.¹⁵ If not properly managed, the release of wastewater containing dyes and/or chemicals into nearby water bodies causes pollution to the soil and waterways of communities who depend on these natural resources for their livelihoods.

Synthetic Fibers

Using fossil fuel derived fibers means that oil and gas extraction are embedded in the modern clothing lifecycle. During oil extraction it is extremely difficult to contain the oil and the chemicals used which results in hazardous spills. In 2019, oil and gas companies in Colorado, New Mexico, and Wyoming reported 2,811 spills, amounting to 23,600 barrels of oil and 170,223 barrels of hazardous wastewater.¹⁶ Petrochemical companies often claim synthetic materials have a lower water footprint than cotton, but studies have shown that polyester's water footprint can be as high as 71,000 cubic meters per tonne of fabric, over 7 times as much water as the global average to grow cotton (10,000 liters of water to grow a kg of cotton or 10,000 cubic meters per ton of cotton)¹⁷.

Synthetic fibers derived from fossil fuels are fundamentally plastic fibers and have the same effect as plastic on the environment. Natural fibers like cotton, wool, and silk are expected to biodegrade in natural environments within several years, but synthetic fabrics, like all plastic, will take hundreds of years to degrade naturally. Studies also show clothing made from synthetic materials shed thousands of microfibers every time we wash¹⁸, dry¹⁹, and wear them. In fact, wearing synthetic fibers has been shown to release even more microfibers than washing them.²⁰ Thousands of minuscule plastic fibers then make their way into the air and waterways, polluting every corner of the planet.

Microfibers are the most common type of microplastic, measuring less than 5mm in diameter. So ubiquitous are microplastics, they are found across the globe, with no eco-system un-touched.²¹ Studies show that these microfibers and microplastics are being consumed by humans via food and water, and inhaled as we breathe, adding up to an estimated 74,000-121,000 microplastic particles consumed per year per person.²² They've been detected in human feces samples of both babies and adults²³ and most recently have even been detected in human blood.²⁴ Although microplastic pollution is now commonly found in the environment and human bodies, little is known of its long-term effects. Data from the FTI 2021 reveals that only 21% of the world's largest fashion brands disclose what the

¹³ Changing Markets (2021) Fossil Fashion: The hidden reliance of fast fashion on fossil fuels

¹⁴ Greene JP (2014) Chapter 3 - Life Cycle Information. In: Greene JP (ed) Sustainable Plastics: Environmental Assessments of Biobased, Biodegradable, and Recycled Plastics. Wiley, New York

¹⁵ Palacios-Mateo, C., van der Meer, Y. & Seide, G. Analysis of the polyester clothing value chain to identify key intervention points for sustainability. *Environ Sci Eur* 33, 2 (2021). <https://doi.org/10.1186/s12302-020-00447-x>

¹⁶ Rider H (2020) Western oil and gas spills tracker <https://westernpriorities.org/2020/02/27/western-oil-and-gas-spills-tracker/>

¹⁷ Water Footprint Network (2017) Water footprint assessment of polyester and viscose and comparison to cotton.

https://waterfootprint.org/media/downloads/WFA_Polyester_and_Viscose_2017.pdf

¹⁸ Kimo (2021) KIMO launches report on microplastic pollution from textiles. <https://www.kimointernational.org/news/kimo-report-on-microplastic-pollution-from-textiles/>

¹⁹ Danyang Tao et al, Microfibers Released into the Air from a Household Tumble Dryer, *Environmental Science & Technology Letters* (2022)

²⁰ University of Plymouth. (2020, March 9). Wearing clothes could release more microfibers to the environment than washing them. *ScienceDaily*. www.sciencedaily.com/releases/2020/03/200309221340.htm

²¹ Bergmann and Klages, 2012; Bergmann et al., 2017; Costa and Barletta, 2015; Kanhai et al., 2019; Lusher, 2015

²² Human Consumption of Microplastics. Kieran D. Cox, Garth A. Covernton, Hailey L. Davies, John F. Dower, Francis Juanes, and Sarah E. Dudas. *Environmental Science & Technology* 2019 53 (12), 7068-7074

²³ Schwabl, Philipp et al. "Detection of Various Microplastics in Human Stool: A Prospective Case Series." *Annals of internal medicine* vol. 171,7 (2019): 453-457. doi:10.7326/M19-0618

²⁴ Leslie, H. A., van Velzen, M. J. M., Brandsma, S. H., Vethaak, A. D., Garcia-Vallejo, J. J., & Lamoree, M. H. (2022).

Discovery and quantification of plastic particle pollution in human blood. *Environment International*, 107199. <https://doi.org/10.1016/j.envint.2022.107199>

brand is doing to minimize the impact of microfibers, suggesting that brands choose not to disclose this information, or they are doing nothing to minimize the impact of microfiber pollution.

Overconsumption

Overproduction and overconsumption have fueled the reliance of cheap fossil fuel-based materials and will have long lasting environmental and social impacts worldwide. Recent reports show the consumption of clothing and footwear is expected to increase by 63% by 2030, with no industry wide solution for the disposal, collection, or recycling of discarded textiles.²⁵ Consumption of textiles in the EU, most of which are imported, accounts for the fourth highest negative impact on the environment and on climate change, and third highest for land and water use from a global life cycle perspective.²⁶ Studies estimate about 5.8 million tonnes of textiles are discarded each year in the EU, the equivalent of 11kg per person.²⁷ Fiber to fiber recycling has only been able to capture 0.1% of textiles produced,²⁸ while the rest accumulate in landfills or are incinerated, as is seen in the Kantomanto Market in Accra, Ghana and the Atacama Desert in Chile.²⁹

Infrastructure and policy are needed to ensure that discarded clothing, of which most contain synthetic fibers are captured before they reach landfills or incineration, so they can be recycled, or disposed of properly. Some brands have started to implement take-back schemes, garment recycling programs, and upcycling/downcycling of textiles to help tackle these issues, but the fashion industry overall is lagging in adopting these methods of clothing recycling. When not properly recycled, clothing made from synthetic materials can further shed microplastics as they degrade or release harmful chemicals as they are incinerated. Incinerating synthetic clothing can produce CO₂, CO, and benzene, as well as large amounts of TPA, benzoic acid, acetaldehyde, and aliphatic C₁–C₄ hydrocarbons, and small quantities of dioxins and furans.³⁰ Synthetic fibers are causing air pollution, exacerbating the microplastic problem, and collecting in landfills where they will stay for hundreds of years, preventing the breakdown of organic materials. The fashion industry needs to be accountable for the damage these synthetic materials have caused and embrace sustainable fibers that can be recycled, reused, upcycled/downcycled, or will biodegrade within a reasonable time frame. It is important that brands also disclose how they define ‘sustainable material’, since, according to the FTI, just 30% of brands disclose how they are defining ‘sustainable’. Knowing this information is essential for identifying greenwashing and developing solutions that address the root of the problem.

Energy Sources

The fashion industry relies heavily on production and manufacturing in many Asian countries with little oversight on the energy sourcing of supplier facilities. Industry experts have observed the use of coal in the manufacturing of textiles of major clothing exporting countries like China, Vietnam, Bangladesh, and Turkey. A 2021 report by Carbon Tracker identified China, India, Vietnam, Indonesia, and Japan as being responsible for over 80% of the world’s planned new coal plants and 75% of existing coal capacity.³¹ The top garment producing countries in the world like China, India, Bangladesh, Vietnam, Turkey, and Indonesia overlap with the top countries sourcing most of their energy from coal.³² Unfortunately, many of these countries have heavily regulated power markets with limited private sector participation, making it difficult for renewable energy technology to penetrate the market. Manufacturing in Asia, where energy grids are predominately fossil fuel based, makes it difficult, but not impossible, to reduce absolute GHG emissions in the fashion supply chain.

²⁵ European Environment Agency (EEA) (2019) Textiles and the environment in a circular economy

²⁶ EEA (2022) Textiles and the environment: the role of design in Europe’s circular economy

²⁷ EEA (2019) Textiles and the environment in a circular economy

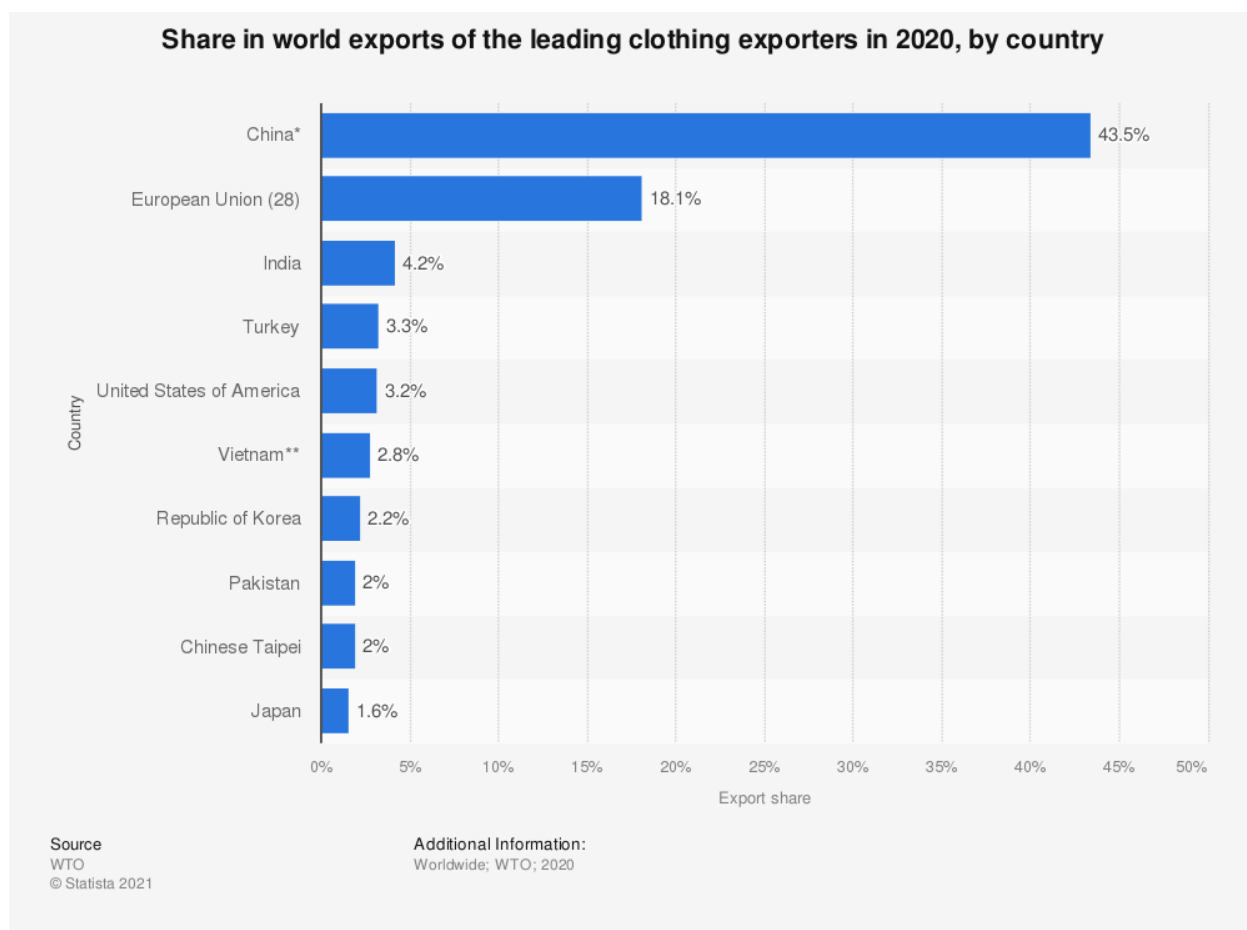
²⁸ Ellen MacArthur Foundation (2017) A new textiles economy report

²⁹ Dead White Man’s clothes. Fashion Revolution. (2019, December 23). <https://www.fashionrevolution.org/dead-white-mans-clothes/>

³⁰ Study of the Organic Compounds Produced in the Pyrolysis and Combustion of Used Polyester Fabrics. Julia Moltó, Rafael Font, and Juan A. Conesa. *Energy & Fuels* 2006 20 (5), 1951-1958. DOI: 10.1021/ef060205e

³¹ Do not revive coal: Planned Asia coal plants a danger to Paris. Carbon Tracker Initiative. (2022, March 3). <https://carbontracker.org/reports/do-not-revive-coal/>

³² World Trade Organization (2021) World Trade Statistical Review 2021

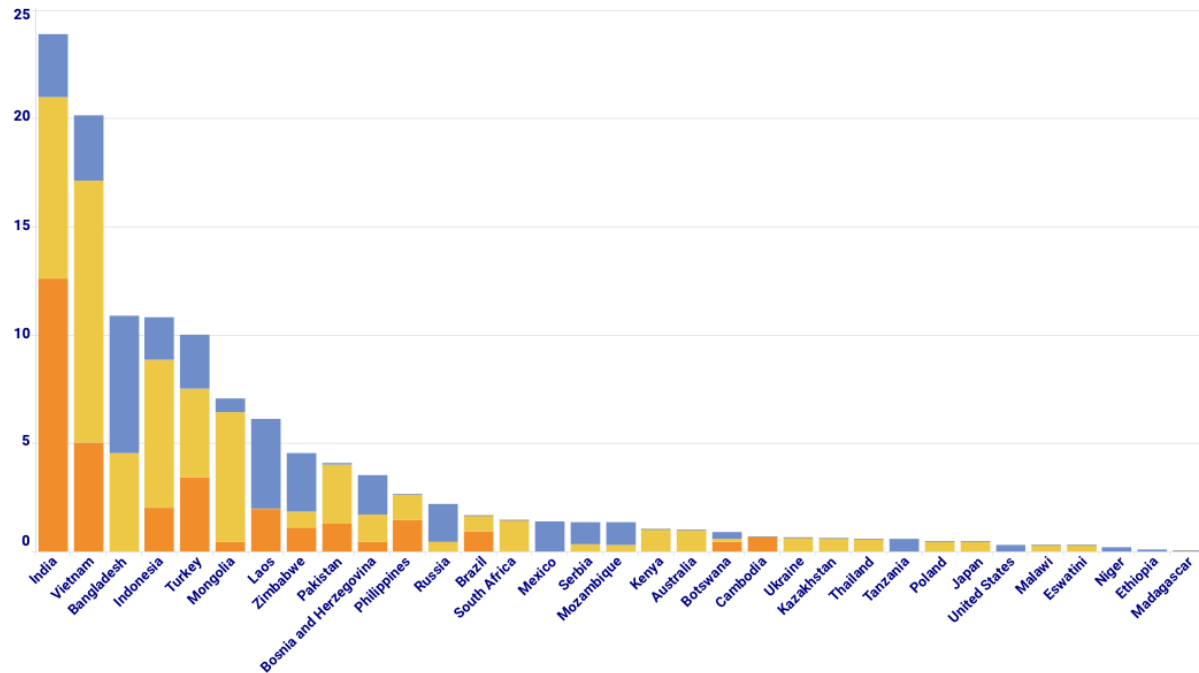


There are over 2,400 coal-fired powerplants worldwide, operating in 79 countries, for a total capacity of about 2,100 GW. A 2022 report by the Global Energy Monitor found that 176 GW of coal capacity was under construction in 20 countries by the end of 2021, with China representing 52% of the total, and countries in South Asia and Southeast Asia representing 37%.³³ However, Japan, South Korea, and China have all pledged to end public support for new international coal plants, eliminating the remaining major financiers of new coal plants. Many countries have made commitments not to build new plants, a trend that is likely to continue as countries decommission remaining plants, especially if China no longer builds new coal plants internationally. Formal cancellation for Chinese backed plants have yet to be seen in Southeast and South Asian countries Bangladesh, Pakistan, the Philippines, Vietnam, and Indonesia. The Southeast and South Asia region represent 65% of globally proposed new coal plants outside China.

³³ Global Energy Monitor (2022) Boom and Bust Coal

Figure 7: Countries with a pre-construction pipeline in 2021, excluding China (gigawatts)

Announced = blue, Pre-permit = yellow, Permitted = orange



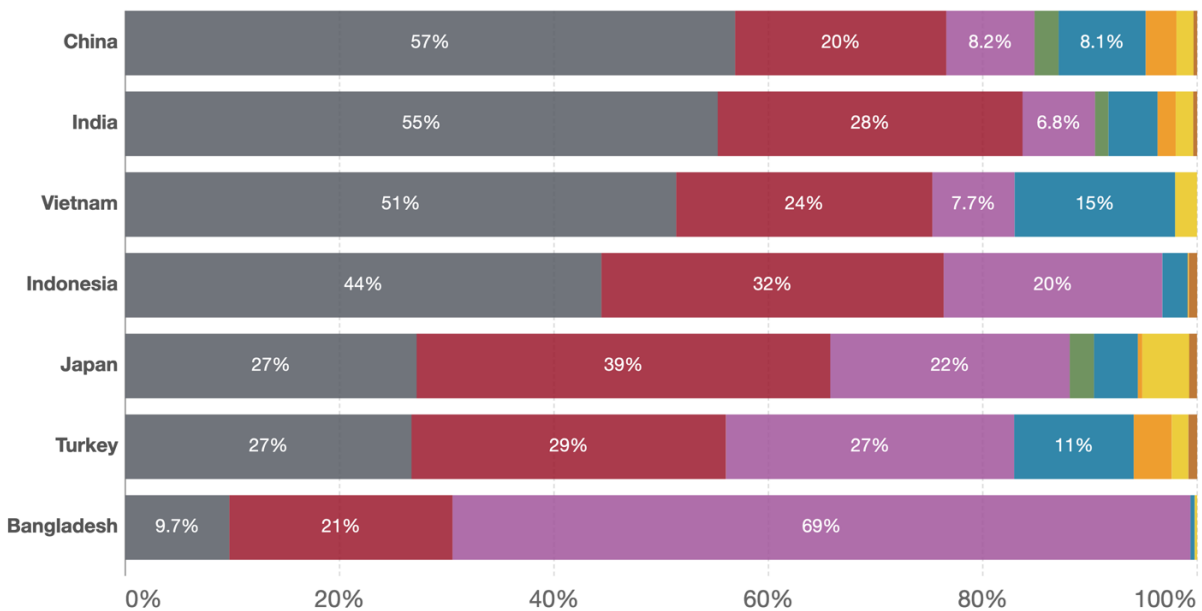
Source: Boom and Bust Coal - Global Energy Monitor (2022)

Primary energy consumption by source, 2020

Primary energy is calculated based on the 'substitution method' which takes account of the inefficiencies in fossil fuel production by converting non-fossil energy into the energy inputs required if they had the same conversion losses as fossil fuels.

Our World in Data

Coal Oil Gas Nuclear Hydropower Wind Solar Other renewables



Source: Statistical Review of World Energy - BP (2021)

OurWorldInData.org/energy • CC BY

Coal is used in two different ways in the fashion sector: to generate the electricity that suppliers use through local electric grids, and by burning it onsite for thermal fuel. Thermal fuel processes in the fashion industry include heating water for dyeing fabric and generating steam. The dyeing, or finishing, and spinning processes together account for over half the emissions in the fashion industry.³⁴ By using waterless dyeing techniques, companies like Nike and Adidas are conserving water resources and eliminating the need for thermal coal in the manufacturing of their products.³⁵ Another solution that needs to be explored is concentrated solar techniques like the one developed by Heliogen that is capable of capturing sunlight through a mirror system and artificial intelligence that can generate heat above 1,000°C, more than enough thermal energy for garment production.³⁶ Innovative sustainable materials, energy efficiency, and alternative thermal energy sources can help to reduce the emissions involved in manufacturing and production.

Bangladesh, a major clothing exporting country, has made natural gas their main energy source because of the significant quantities of natural reserves in the country. Natural gas and liquified natural gas (LNG), are heralded as much more environmentally friendly alternatives to coal and oil because of the lower GHG emissions when burned. Although this is true, the Natural Resources Defense Council found LNG's overall carbon footprint to be just as bad, if not worse, for the environment because of the energy required for liquification and re-gasification of natural gas and the associated methane leaks during processing.³⁷ Natural gas leaks release methane (CH₄) into the atmosphere which has a 20-year global warming potential 84 times greater than that of carbon dioxide.³⁸ Methane leaks pose a greater threat to global temperature rise than those from burning coal or oil and research suggests that methane leaks in the US are 5 times greater than estimates from the US Environmental Protection Agency.³⁹ While natural gas burns cleaner than other fossil fuels, it is still a finite resource with energy intensive processing that is susceptible to leaks and should be carefully considered as an energy source.

Biofuels, fuels made from organic materials and crops, are also a contentious source of renewable energy. Biofuels include the burning of wood, discarded materials, or agricultural products to generate thermal energy. Some scholars argue that biofuels are a form of green energy because the carbon sequestered during cultivation is released when burning making it a net zero emissions energy source. Therefore, it is highly considered when transitioning away from coal as a thermal energy source. It is important to note however, that biofuels/biomass still emit harmful greenhouse gases and are not helping to decrease global GHG emissions. Thermal based energy sources include utilizing agricultural products like corn and soybeans, which rely on deforestation for land use, require incredible amounts of water, and involve the use of polluting chemicals. Biofuels compete for land use, increase food insecurity, and lead to excessive use of water and land resources that are necessary for vulnerable populations.⁴⁰

Burning wood for biofuel is also common in many countries. Trees take decades to centuries for the sequestration of carbon to occur, yet wood accounts for 86% of global biomass production.⁴¹ Trees sequester carbon at variable rates, but the European Environment Agency claims that a mature tree can take as little as 22 kilograms of carbon dioxide

³⁴ Stand.earth (2020) Fashion Forward: A roadmap to fossil-free fashion

³⁵ Nike and adidas show cautious support for eco-friendly Dye Technology. Guardian News and Media. (2015, April 24). <https://www.theguardian.com/sustainable-business/sustainable-fashion-blog/2015/apr/24/nike-and-adidas-show-cautious-support-for-eco-friendly-dye-technology>

³⁶ Heliogen (2021). "Unlocking the Power of Sunlight." <https://heliogen.com/>

³⁷ NRDC (2020) Sailing to Nowhere: Liquefied Natural Gas is not an Effective Climate Strategy

³⁸ Myhre, G.; Shindell, D.; Bron, F.-M.; Collins, W.; Fuglestad, J.; Huang, J.; Koch, D.; Lamarque, J.-F.; Lee, D.; Mendoza, B.; Nakajima, T.; Robock, A.; G Stephens, T. T.; Zhang, H. Anthropogenic and Natural Radiative Forcing. In *Climate change 2013: The Physical Science Basis. Contribution of working group I to the fifth assessment report of the intergovernmental panel on climate change*; Stocker, T. F., Qin, D., Plattner, G. K., Tignor, M., Allen, S. K., Boschung, J., Nauels, A., Xia, Y., Bex, B., Midgley, B. M., Eds.; Cambridge University Press, 2013.

³⁹ Weller, Z. D., Hamburg, S. P., & von Fischer, J. C. (2020). A national estimate of methane leakage from pipeline mains in natural gas local distribution systems. *Environmental Science & Technology*, 54(14), 8958–8967. <https://doi.org/10.1021/acs.est.0c00437>

⁴⁰ Gonzalez, Carmen G., An Environmental Justice Critique of Biofuels (November 28, 2017). Energy Justice: US and International Perspectives (Raya Salter, Carmen G. Gonzalez, and Elizabeth Ann Kronk Warner, eds.) Edward Elgar Publishing, 2018, Available at SSRN: <https://ssrn.com/abstract=3274097>

⁴¹ World Bioenergy Association (2019) Global Bioenergy Statistics 2019

out of the atmosphere every year.⁴² A tree would need to be managed and untouched for hundreds of years to sequester the carbon emit from burning a tree, because biological carbon storage can be reversed when forests are cut and burned. Studies have shown that smokestack CO₂ emissions from burning wood can be 30 percent higher than those of coal per unit of generated energy.⁴³

Emissions Reductions

A new report from the NewClimate Institute and Carbon Market Watch found that while companies are increasingly committing to lower emissions, their targets are often underwhelming, ensuring their success without major alterations to business-as-usual.⁴⁴ In response, the Science Based Targets initiative (SBTi) developed the Net-Zero Standard that provides a blueprint for companies to align their net-zero plans with science.⁴⁵ Absolute emissions reductions targets aligned with climate science are the clearest path to lowering global GHG emissions. However, brands use carbon intensity targets, especially for Scope 3 emissions, which results in them emitting harmful greenhouse gases at a similar rate to their current output. For example, if the volume of goods sold by a company increases, intensity targets allow the company to increase their GHG emissions relative to their sales.⁴⁶

Although transparency of carbon emissions is increasing, the data is difficult to understand and compare. Some brands report their gross global emissions, but these are calculated against total revenue, others state emissions reductions relative to sales. It's difficult to find companies with absolute Scope 3 emissions reduction targets. This is confusing and misleading for consumers who want to decrease their carbon footprint. The fashion industry needs a comparative standard that decouples revenue and emissions in the fashion industry and mandatory disclosure of energy consumption in the supply chain by energy source.

The world's largest brands have the most resources and responsibility to improve tracking and reporting of their Scope 3 and supply chain emissions. The Science Based Targets initiative (SBTi) was developed to assist companies in understanding their emissions and aligning their climate pledges with the latest climate science. To be verified by the SBTi, targets must be science-based, transparent, verifiable, and monitored by regular reporting. By using science-based targets, companies are able to create a GHG emissions reduction roadmap that encourages renewable energy investment in the supply chain and manufacturing efficiency to reach their goals. The Science Based Target initiative (SBTi) gives companies a pathway to emissions reductions by specifying how much and how quickly they need to reduce GHG emissions. It's imperative for all big companies to understand their supply chain emissions and create emissions reduction strategies that are realistic, aligned with, and verified by the Science Based Targets initiative. The 2021 FTI however found that only 26% of the 250 brands assessed have science-based targets. It is important to note that for the 2021 FTI methodology, it was not a requirement for brands assessed to disclose if their targets are verified or not so the percentage of brands disclosing verified science-based targets may be much lower.

Purchasing Renewable Energy

Instead of investing in renewable energy at the supplier facility, to which output is limited by size, the current trend in the fashion industry is to use Power Purchase Agreements (PPAs) and Renewable Energy Credits (RECs), a type of Energy Attribute Certificate (EAC). PPAs can be a great tool if they are used to directly purchase renewable energy on the same grid as their supplier facilities, but the rules and regulations of the PPA market vary from country to country. PPAs are contracts, typically long term, that guarantee a company's energy use will be supplemented by renewable energy somewhere in the same state or country and supplied to the energy operator who acts as an intermediary. Although most PPAs are supplied by renewable energy, some are simply part of a deregulated energy market with no renewable energy sources. Virtual PPAs allow for the purchase of electricity

⁴² Forests, health and climate change. European Environment Agency. (2021, May 11). <https://www.eea.europa.eu/articles/forests-health-and-climate-change>

⁴³ Laganière, J., Paré, D., Thiffault, E., & Bernier, P. Y. (2016). Range and uncertainties in estimating delays in greenhouse gas mitigation potential of forest bioenergy sourced from Canadian forests. *GCB Bioenergy*, 9(2), 358–369. <https://doi.org/10.1111/gcbb.12327>

⁴⁴ New Climate Institute (2022) Corporate Climate Responsibility Monitor 2022

⁴⁵ The Net-Zero Standard. Science Based Targets. (n.d.). <https://sciencebasedtargets.org/net-zero>

⁴⁶ Why 'eco-conscious' fashion brands can continue to increase emissions. Guardian News and Media. (2022, April 9). <https://www.theguardian.com/environment/2022/apr/09/why-eco-conscious-fashion-brands-can-continue-to-increase-emissions>

outside of the scope of the power grid supplying the power, which means they're not improving the renewable energy infrastructure or demand of the supplier state or country.

Not every country has a PPA market, making it difficult for large companies who manufacture products in these countries to purchase renewable energy. Vietnam is in the process of developing their Direct Power Purchase Agreement (DPPA) market because 30 large international and domestic businesses including Nike, Puma, Adidas, and H&M sent a letter the Ministry of Industry and Trade (MOIT) of Vietnam asking for support developing a pilot DPPA program.⁴⁷ The MOIT has since released a draft of the DPPA mechanism they will pursue later this year in order to assist the companies with procuring renewable energy. This demonstrates the power of the global fashion industry on governments and their ability to find solutions to their collective issues.

Similar to PPAs, RECs also allow for the purchase of renewable energy from outside the supplier facility's power provider. An REC, however, allows companies to purchase contracts for one-megawatt hour (MWh) of energy produced, but this energy does not need to be on the same power grid as the is it meant to offset facility. Therefore, suppliers in countries without renewable energy options will use the fossil fuel-based energy (e.g. coal, oil, gas) from their power provider and the fashion company that will sell the clothing can confidently say they purchased renewable energy to offset the fossil fuel-based energy. RECs will not improve the availability of renewable energy in a supplier market or decrease the amount of emissions a facility emits, they simply allow a company to show renewable energy use, without having to make responsible emissions reduction goals and facility efficiency improvements. A 2020 report by StandEarth found that RECs have little to no impact on renewable investment and are always additional to underlying energy costs.⁴⁸ Interestingly, RECs and PPAs consider burning wood for biofuel a renewable energy source, which is highly unsustainable and leading to an increase in the levels of harmful GHG emissions in the atmosphere.

Legislation

Now is the time to strengthen global legislation to track and account for the fashion industry's total emissions and energy use in the supply chain. Stronger legislation is needed to move the fashion industry away from harmful practices and create a more transparent and accountable fashion supply chain. The European Commission has identified many of the issues outlined in this report and does have planned legislation that will be enforced this year to enable a more sustainable, circular economy. The EU Taxonomy Regulation (2020/852) will define the ways that companies can talk about their sustainable investments and ensure standard definitions are applied across industries. In its current state, it only applies to climate change mitigation and climate change adaptation objectives. In the future it's intended to include pollution prevention, the transition to a circular economy, the sustainable use and protection of water, and the protection and restoration of biodiversity and ecosystems.

The EU's Regulation on Ecodesign for Sustainable Products bans the greenwashing of practices that mislead customers about the durability or environmental footprint of its products. This regulation, introduced in 2009, was originally intended for energy-related products but will expand to include electronics, textiles, furniture, mattresses, and tires. It also mandates that companies make products more durable, reliable, reusable, repairable, easier to maintain, refurbish, and recycle, and energy and resource efficient. The proposal also introduces transparency requirements in relation to the destruction of unsold goods to disincentivize overproduction and waste. This proposal will provide customers the right to know how long their products will last and how they can be repaired using a digital passport. These changes will force the fashion industry to move towards a more circular economy where clothing lasts longer, can easily be repaired by the company, and can be conveniently recycled.

The European Commission also presented a package of European Green Deal proposals which includes the EU Strategy for Sustainable and Circular Textiles under the Circular Economy Package. This proposal targets the fast fashion and textile industries and sets goals for long-lived and recyclable textiles by 2030 that are free of hazardous substances, produced in respect of social rights and the environment, and are mostly made of recycled fibers. The

⁴⁷ Nguyen, O. H. K., & Nguyen, T. H. (2022, January 19). *Vietnam: January 2022 updates to the new draft decision on corporate DPPA Pilot Program for Renewable Energy*. Lexology. <https://www.lexology.com/library/detail.aspx?g=19395f70-8a15-4bde-990b-bcaf10aa1b3d>

⁴⁸ StandEarth (2020) A Roadmap to Fossil Free Fashion.

new regulations will not be adopted until 2024. The proposal calls for greater reform but falls short of banning the incineration and landfilling of textiles. The commission encourages materials innovation and labels microfibers as an issue, but fails to call for the elimination of synthetic fibers.

The UK recently announced mandatory climate disclosure for UK companies with more than 500 employees and £500 million in turnover using the TCFD (Task Force on Climate-Related Financial Disclosures) reporting framework as a guide.⁴⁹ This is a great initiative, but the UK climate disclosure mandate will not alter the course of most fashion companies because it does not mandate the inclusion of Scope 3 emissions, where most of fashion's emissions occur, or enforce progress towards stated goals.

The US SEC (Securities and Exchange Commission) has also proposed similar climate disclosure mandates for all publicly listed companies but also leaves Scope 3 emissions disclosure up to the company.⁵⁰ According to the SEC, if a company has found Scope 3 emissions to be material or if they have set a GHG emissions target or goal that includes Scope 3 emissions, they need to disclose Scope 3 emissions. This will also allow companies to ignore some of the greatest sources of emissions in their value chain and enable them to continue to emit harmful pollutants.

Conclusion

Global governments have been slow to act on the biggest sources of GHG emissions while the world's largest companies continue to use fossil fuels, polluting waterways, the air, and our oceans without consequence. The fashion industry is responsible for many of the social and environmental issues around the world, yet a lack of transparency continues around how brands are tracking and reducing their GHG emissions in the supply chain. Without transparent disclosure, it becomes more complicated to find innovative solutions to improve efficiency, decarbonize their supply chain, or responsibly limit clothing production. Fashion brands play a central role in finding solutions to decarbonize the industry and sharing innovative ideas and technology to improve efficiency. Governments need to push for greater transparency through mandatory disclosures on human rights and environmental practices, in order to enable a circular economy. Consumers and organizations should scrutinize claims from fashion industry brands sourcing fibers from fossil fuel dominant countries and demand a fashion industry that conserves and restores the environment and values people over growth and profit.

Recommendations

Brands

- **Supply Chain Transparency** – Brands should track and disclose the energy consumption of supplier facilities including the energy sources or power providers to prove emissions reductions and increase consumer trust. Transparency leads to scrutiny, which leads to accountability and ultimately change. It gives impacted stakeholders (e.g. civil society), the information necessary to leverage change.
- **Science Based Targets** – Brands need to establish science-based targets, which are also SBTi verified, with reduction measures, timelines, and goals to provide a clear pathway to emissions reductions. Science-based targets align with the latest climate science and are constructed to keep GHG emissions in line with a 1.5°C climate change scenario. Brand claims of science-based targets “alignment” without being verified by the SBTi should be treated as greenwashing until they can be supported by public disclosure of progress data and verified.
- **Supplier Partnerships for Renewable Energy** – Brands should encourage and support suppliers to make the switch to renewable energy sources. For example, H&M, has partnered with WWF to launch a supplier program in India that assists with the purchasing of low carbon energy.⁵¹ Brands have the most power, resources, and responsibility to address these issues and as such, must be providing financial support to do so.
- **Work with Governments** – Brands should work with production-country governments to implement direct power purchase agreement (DPPA) markets to support renewable energy infrastructure and growth. DPPAs

⁴⁹ UK to enshrine mandatory climate disclosures for largest companies in law. GOV.UK. (n.d.).

<https://www.gov.uk/government/news/uk-to-enshrine-mandatory-climate-disclosures-for-largest-companies-in-law>

⁵⁰ Statement on Proposed Mandatory Climate Risk Disclosures. SEC. (2022, March 21).

<https://www.sec.gov/news/statement/gensler-climate-disclosure-20220321>

⁵¹ H&M Group (2020) Sustainability Performance Report 2020

help to decrease reliance on fossil fuel energy sources and ensure that renewable energy needs are met for companies. The DPPA pilot program in Vietnam is a great example of brands working together with governments to improve renewable energy options.

- **Work Collaboratively** – Brands should utilize existing coalitions to create knowledge sharing and innovation workshops. Brands need to influence the adoption of direct PPA markets, fund revolutionary materials development, replace wet processing, automate steam control, and research laser technology and recovery of condensate in wet processing. Shared lessons in production and processing efficiency could also cut down on manufacturing waste, water use, energy, and minimize production in the industry, especially in the dyeing and coloring process.
- **Direct PPAs** – Brands should discontinue the use of Energy Attribute Certificates (EACs) that do not directly supply renewable energy to supplier connected power grids. Brands looking to have meaningful emissions reductions should utilize direct PPAs instead of virtual PPAs, RECs, or other renewable energy certification schemes. Brands should also encourage adoption of PPAs in countries where these markets are not yet developed.
- **End Fossil Fuel Use** – Fossil fuels are the leading cause of global climate change. Brands must proactively encourage supplier facilities to switch to renewable energy. The use of fossil fuel derived clothing, like polyester, should be phased-out because of the immense environmental toll of synthetic fibers on people and the planet.
- **Building Efficiency Improvements** – Brands should invest in HVAC improvements in manufacturing facilities and sewing machine upgrades that use less energy. Brands should prioritize updating and improving efficiency in supplier facilities.
- **Environmentally Preferred Materials** – Brands should increase their demand for environmentally preferred materials like organic cotton. The fashion industry needs to sustainably source and produce garments which do not cause environmental or human harm.

Governments

- **Greenwashing Prevention** – Governments should adopt stricter rules for greenwashing. Brands should disclose the energy used to create their products, explain the product life and durability, and encourage recycling and repair. The terms used by brands should be tied to technical definitions and measurable outcomes (e.g. EU Taxonomy Regulation, EU Ecodesign for Sustainable Products).
- **Phase-Out Biofuels** – Governments should consider the negative impacts and outcomes of using wood-based biofuels and similar unsustainable biomass production. Carbon sequestration during plant growth can be reversed once the crop is harvested and burned, eliminating environmental benefits of biomass/biofuel production.
- **Circular Economy** – Governments should encourage circularity of products to prevent excessive waste and decrease GHG emissions, (e.g. EU Strategy for Sustainable and Circular Textiles). Governments need to mandate that products are recyclable, designed to last long, free of hazardous materials, and produced with respect to social rights and the environment.
- **Support Renewable Energy Markets** – Governments should stop subsidizing fossil fuels and allow renewable energy options to thrive in national markets. According to the International Renewable Energy Agency (IRENA), renewables are now more cost effective than fossil fuels and will help to reduce national GHG emissions.⁵² Inclusion of a direct PPA market can be effective in ensuring investment in renewable energy sources and preventing stranded assets (e.g. decommissioned coal plants).

Civil Society

- **Demand Decarbonization** – Consumers are buying into the current fashion system but can have a greater impact if they refuse to buy products produced by energy from fossil fuels and/or made from fossil fuel derived materials. Consumers should demand the end of virgin synthetic materials and insist on clothing that lasts longer, has a low carbon footprint, and is recyclable. Although consumer purchasing power is one way to make an impact, ultimately, the responsibility on brands should be to phase out production of unsustainable products. The easiest decision for a consumer to make is to not have to make one at all.

⁵² IRENA (2020) Renewable Power Generation Costs in 2020

- **Utilizing Transparency Reporting Tools** – Fashion Revolution’s Fashion Transparency Index (FTI) is a valuable tool for understanding the social and environmental issues in the industry and can be used to improve transparency in the fashion industry. Greater interest in results and brand disclosures by impacted stakeholders and power brokers like investors and policymakers, will improve transparency in the industry because transparency of information empowers stakeholders to scrutinize and hold brands accountable for human rights and environmental impacts, which leads to change.

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