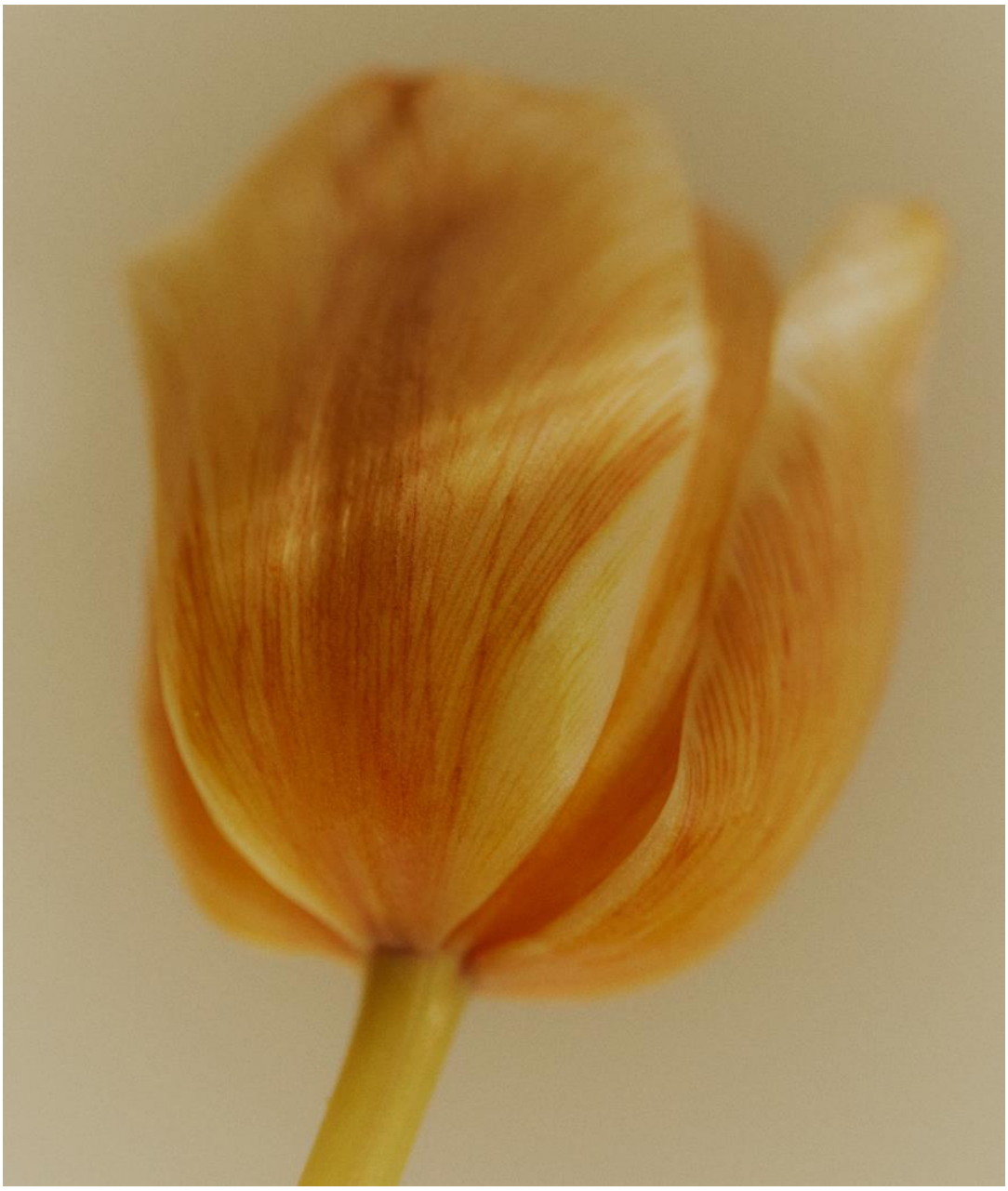
THE
FASHION
PACT

CLIMATE PILLAR

SUPPLIER SUPPORTING PACKAGE - TIER 4



INTRODUCTION

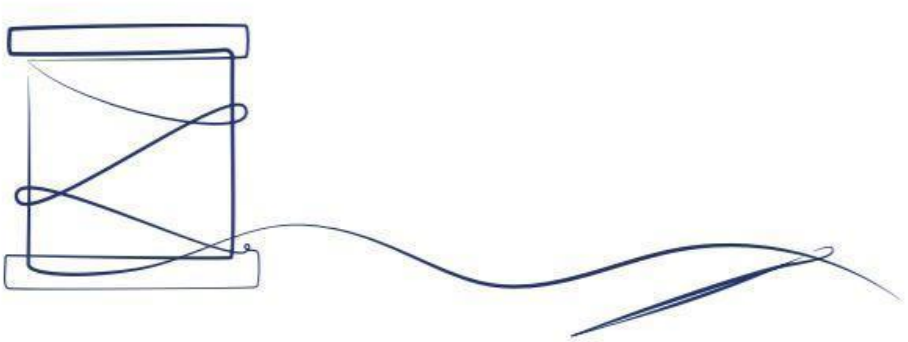
Climate action is becoming increasingly important for the fashion industry. Whether it is from external pressure by consumers or investors, (inter)national legislation, entrepreneurial spirit or risk management, more companies are taking steps to incorporate climate action, all along their value chain. Fashion suppliers are key to this climate action movement, as they account for some of the most resource-intensive areas of the industry, and solutions can be easily implemented to unlock significant benefits for all stakeholders. This Support Package for suppliers aims to provide guidance to suppliers in the beginning stages of developing and integrating a holistic climate strategy. In particular, this document is prepared for Tier 4 suppliers, although many key messages are applicable to suppliers in all tiers. As referenced throughout this document, Tier 4 suppliers should refer to the other tier documents if they want to learn more specific information for these other suppliers.

How to use this guidance

The aim of this guidance is to help producer Fashion Pact signatories and suppliers to Fashion Pact signatories get started and accelerate their progress on climate. Each section aims to help explain key terms and concepts, and then shares references to guidance, publications and organisations that can further support in your company's journey.

Specifically, this guidance sets out to:

- Present cost effective climate strategies that help build the business case for climate action.
- Provide clarity on the basic steps you should consider in developing a climate strategy.
- Provide a useful overview of related terminology and ideals.
- Connect you to the right external guidance documents and organisations - helping you find the right content without duplicating efforts.



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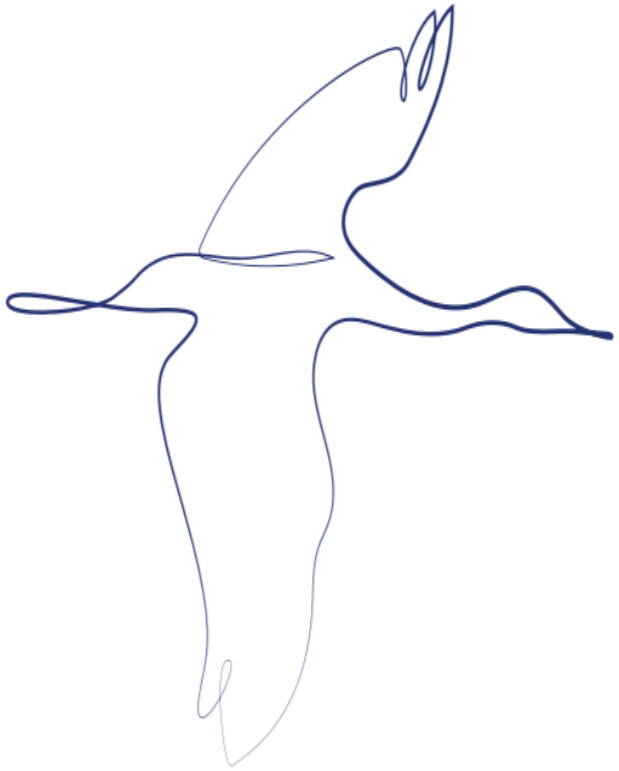


Who should use this guidance?

This guidance is one of three levels of package available for Fashion Pact signatories. This document is one of four within the supplier package, which can be used either by producer signatories to the Pact, suppliers of the Pact producer signatories, or by brands and retailers wanting to work with suppliers or to learn more about supply chain action. The other two packages are the accelerators package (for brand/retail companies who are starting their climate journey) and the leaders package (for brand/retail companies who are advanced in their climate journey).

CLIMATE CHANGE: WHY IT'S TIME TO ACT NOW

The concentration of greenhouse gases (GHGs) in the atmosphere has increased to such an extent that it is changing the climate and increasing global temperatures. The effects of rising average temperatures will be numerous and wide-reaching, including the acidification of oceans, a rise in sea levels from melting glaciers, and an increased frequency of extreme weather events.

As well as impacting millions of people and devastating natural systems across the world, the effects of climate change are expected to significantly impact the fashion value chain. Heat waves, water scarcity and changing weather patterns, floods, changes in agricultural pests, and extreme weather events like hurricanes will negatively impact the production of raw materials, causing business disruptions and increasing costs. *These disruptions will be* strongly *felt in many of the geographical regions in which suppliers and producers are located*, impacting both livelihoods and biodiversity.

Taking action on climate impact reduction and climate adaptation will both be important to ensure that producers can keep their operations open in the future.

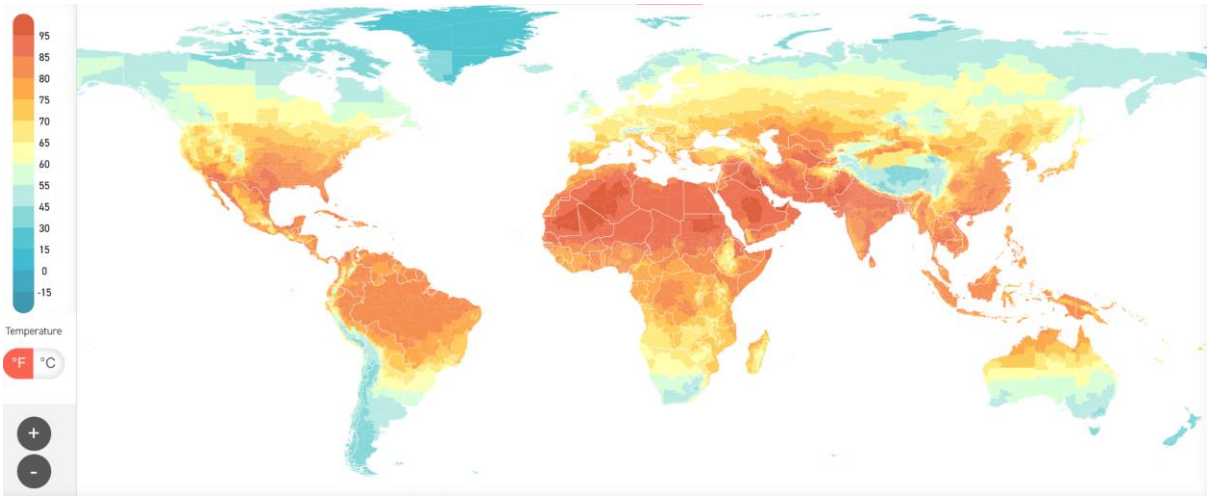


Figure 1: Predicted average summer temperatures (°F) in the next 20 years (2020-2039). Source: Climate Impact Lab

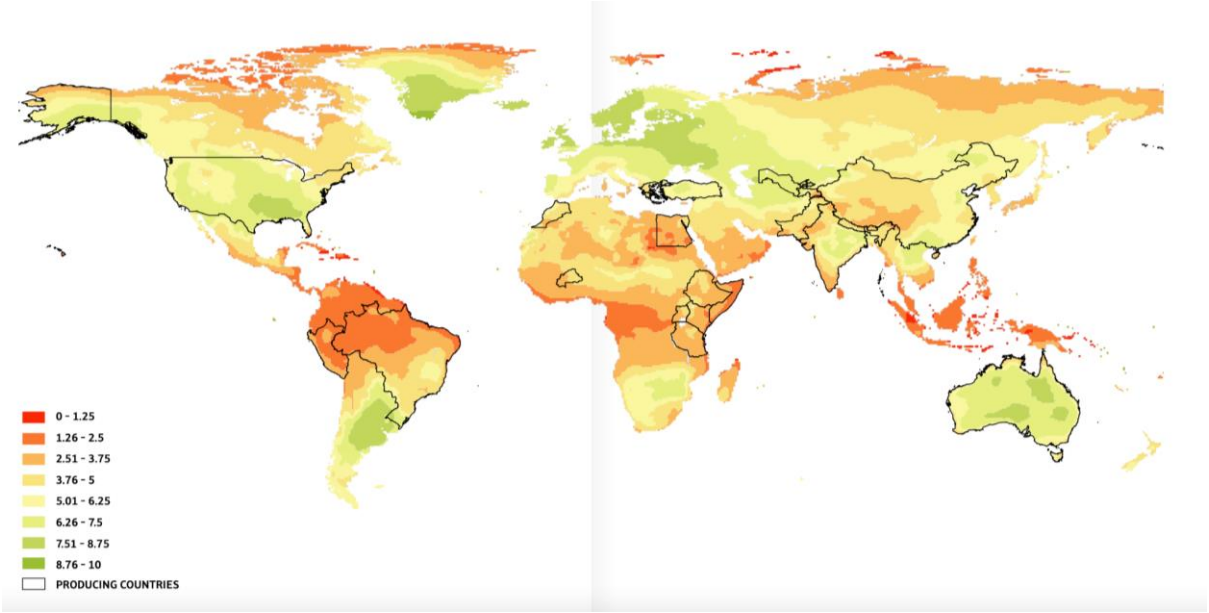


Figure 1: Climate change risk index for cotton, overlapped with producing countries (2036-2060). Source: BSR and Kering, 2015

Fashion companies are facing increased pressure from shareholders, customers, investors, regulators and civil society organisations, to take action on climate. More than 195 countries have signed up to the 2015 Paris Agreement, aiming to limit warming to 1.5°C. This means that every country is likely to have stronger emissions regulations over time, and that preparing for this future can make your business more resilient.

There are also many immediate business benefits from focusing on energy efficiency and GHG emission reduction, ranging from financial savings, improved customer relationships and increased governmental support.

One of the most obvious benefits to producers is cost reductions. By making your own operations and inputs more efficient, costs can be reduced. These reduced costs not only support profitability, but also allow producers to make a more attractive offer or price to their customers in a competitive market.

In addition, sustainability and transparency of production methods is now a priority for brands' sourcing executives, who increasingly look for process improvements when searching for suppliers. Increased transparency strengthens suppliers' integrity and accountability, and thus enhances their customers' trust and loyalty. For example, companies including H&M have begun giving preference to MMC fibres made from alternative sources, such as agricultural residues. Mounting consumer demand also increases brands' desire to find suppliers with tangible sustainability improvements and commitments in their operations, with transparent practices that can be easily communicated to consumers. Where brands are sourcing materials directly, this can create a lucrative business relationship with a tier 4 producer. Where they are sourcing indirectly through tier 1-3, these supplier companies may also have been instructed to source materials with particular sustainability criteria, which will create new market opportunities for tier 4 producers with clearly defined and verified climate activities. Entering your data into an online tool such as the Higg Facilities Environmental Module (FEM) could create a more attractive offer for brands, as this will make it easier for them to calculate their total value chain emissions. This will also reduce the number of customer inquiries for such data.

Suppliers who adopt sustainable practices and improve their operations may be more likely to receive government support via higher climate targets and tax benefits.

Suppliers who adopt sustainability measures such as shifting to renewable energy will be future-proofing their business, reducing their risks of price volatility and regulatory risks. For example, changing regulations on high carbon energy sources and protection of natural systems such as water and biodiversity, could create penalties for suppliers who have not yet phased out their fossil fuel usage or optimised the energy or water use of their operations. Installing on-site renewables will also help to avoid the market fluctuations of fossil fuels, reducing the operational risks of producers' facilities. Therefore, making changes to your business today will reduce the severity of changes required in the face of future regulations or market shocks.

Climate change action can spur innovation, for example leading to new production methods that decrease negative impacts. Finally, with increasing internal and external pressure it is quite likely that suppliers not taking timely action will be left behind by both retailers, stakeholders, and investors, and lose their so-called licence to operate. All these actions can increase the competitiveness of a supplier and create new market opportunities. Therefore by adopting more efficient and cleaner production processes, suppliers can create large financial savings, enhancing their competitiveness, as well as benefiting the lives of its workers and local communities.

Acting on climate change mitigation and adaptation will also result in considerable benefits to society, ranging from reduced air pollution, improving human health, fully decarbonized energy systems and production processes, sustainable and fulfilling consumption patterns, sustainable agricultural practices, addressing biodiversity loss, and creating sustainable cities. Increased transparency and sustainability of operations can help in reducing negative environmental impacts, both locally and globally. Companies who reduce their emissions can help their local communities through reduced air pollution and cleaner effluent. Globally, reducing the fashion industry's emissions will help reduce the dangerous impacts of climate change, such as higher global temperatures, sea level rise and extreme weather events.

General Resources To Get Started

Even for producers in tier 4 of the value chain, it may be worthwhile understanding the broader context around climate for the fashion and textiles industry. Key resources to use as a jumping off point for working on climate in fashion include:

Getting started on climate:

- The Fashion Industry Charter for Climate Action Playbook
- The SBTI Apparel and Footwear guidelines

What is the pathway and progress for the industry:

- Fashion on climate, McKinsey and GFA
- Roadmap to Net Zero Delivering Science-Based Targets in the Apparel Sector, WRI, SAC, Aii (draft)
- Environmental Improvement Potential of Textiles (IMPRO Textiles), European Commission (2014)
- Pulse of the Fashion Industry 2019, BCG on behalf of Global Fashion Agenda (2019)
- State of Fashion 2020, McKinsey on behalf of Business of Fashion (2019)

Best practice case studies:

- Sustainable Action and Vision for a Better Environment, Project Final Report, Puma (2016)

SECTION 1: UNDERSTANDING AND MEASURING IMPACT

Why is it useful to understand and measure impact?

In order to take the most strategic action on your energy use and GHG emissions, it is usually beneficial to first measure, or quantify, your impacts. Particularly for energy use, measuring each on-site activity and the amount of energy being used by that process can help identify quick wins in energy efficiency that can immediately reduce spending. Further analysis into emissions in chemical use, process changes, reduced inputs and lower GHG emissions options can help identify medium term priorities that make business sense. An overall understanding of your resource use will help to identify and prioritise opportunities for performance improvements in your operations, as well as observing any areas that may be susceptible to risks in future. Measuring your impact is also vital to evidencing your company's emissions reductions and other improvements in your operations. Put simply, what gets measured gets managed.

How to understand your emissions and costs

This section will outline how to calculate your energy use and GHG emissions, and the tools available to assist with this. For tier 4 producers, the majority of your impact is likely to be from farming or extraction processes, such as the use of energy (including machinery), energy for irrigation water and chemicals for on-site use, feed for any animals, and the extractives impacts for synthetic or cellulosics fibres such as deforestation emissions or oil and gas emissions. Pre-spin production can also have energy and chemical impacts, such as fibre processing for synthetic or cellulosic fibres. On-site practices can help to reduce all these sources of cost and emissions, alongside strategic investment in equipment or process upgrades where it makes commercial sense, and exploring alternative input sources. Actions to take on these key areas will be covered in Section 3.

When starting to measure your greenhouse gas emissions, it is important to firstly understand which types of emissions you need to count. For Tier 4 producers, you will need to consider all on-site energy use, as well as any key materials, inputs or emissions that go into your process. For example, cotton producers will need to account for chemicals used, water usage and farming practices, alongside your energy use, when understanding your emissions. There are several types of types of greenhouse gas emissions to understand. All greenhouse gases have a different warming potential for the world's atmosphere and are therefore converted into carbon dioxide equivalents (CO_2e) when companies calculate their emissions. For more information on the conversions, see this guide on converting non carbon GHG into carbon equivalents.

Once the emission boundary is set according to one of the approaches above, GHG emissions are grouped in three emission categories - Scope 1, Scope 2, and Scope 3. These three categories together make up a supplier's total value chain emissions, or GHG footprint, as it includes the "own operations" – scope 1 and 2 – and the upstream and downstream activities – scope 3.

- Scope 1 are emissions for direct energy use (e.g. direct onsite fuel consumption).
- Scope 2 are emissions from indirect energy use (e.g. emissions for grid electricity).
- Scope 3 covers 'indirect' emissions, both upstream and downstream in the value chain.

Some examples of scope 3 emissions for tier 4 producers may include chemical inputs, or materials being used in processes.

Measuring emissions

For tier 4 producers, there are two main ways to measure your emissions and overall impacts. Firstly, online tools and certifications can be a useful method of calculating emissions and identifying hotspots for reducing impacts. Secondly, certifications (see Section 2) can be another useful method of measuring and reducing emissions.

A quantification tool such as The Cool Farm Tool can be useful in helping you to initially quantify your impacts. This tool allows producers to quantify three main impacts; greenhouse gas emissions (a field-level assessment including nutrients, energy and land use), biodiversity impacts (a quantitative scoring of whole farm management) and water usage (including crop irrigation requirements and blue and green water footprints). Quantifying your impacts in this way can help you to make more informed on-farm decisions that will reduce your environmental impact. This tool also rewards good agricultural practice, giving producers points for positive actions and well-evidenced progress, as well as showing hotspots for environmental impacts to be reduced.

How to start

There are a variety of approaches used by suppliers to measure (or model) their GHG emissions across all 3 scopes. The most widely-recognised and credible standard for GHG accounting is the Greenhouse Gas Protocol (GHG Protocol).

The GHG Protocol has a number of guidelines and standards for companies to use for measuring and reporting GHG emissions. The basic guide on GHG accounting is the Guide to Corporate GHG Accounting, which provides guidance to companies on how to gather data and measure GHG emissions. Even if companies use different standards or guidelines, the recommendation would still be to also align with the GHG protocol guidance.

Measuring scope 1 and 2 emissions

Scope 1 and 2 emissions are relatively straightforward to measure, in that they refer to the direct and indirect energy use of a producer's own operations. The company itself will therefore have direct access to the energy and fuel data that should be converted into GHG emissions.

For measuring scope 2 emissions, two different approaches exist to calculating emissions, the 'location' and the 'market-based' approach. This is described in the detail in the GHG Protocol Scope 2 Guidance.

To understand how to calculate your scope 1 and 2 GHG emissions, you can ask the following questions:

1) Are you using energy from the grid?

If not, just calculate your on-site energy use (this is scope 1)

2) If yes, are you using any 'improved' energy supply such as a more sustainable energy provider?

If not, use a 'location-based' approach as below

If yes, use the 'market-based' approach as below

Location-based: You use standard grid emission numbers for the country or state where you are consuming energy.

Market-based: You have a specific emissions profile provided by your energy supplier, demonstrating how their impacts are better than the standard grid emissions.

How to calculate your GHG emissions

To convert energy data into GHG emissions, a conversion analysis needs to be carried out based on a number of different factors. In particular, the types and sources of energy used and key conversion factors will help you convert energy use data (e.g. activity data) into GHG emissions. Understanding typical emissions for chemical inputs and material inputs will also be important.

Conversion factors recommended by the UNFCCC and created by IPCC can be found here, and can be used to identify impacts from elements like chemical use. Some industry tools like the SAC MSI and the SAC FEM also embed these emission factors. LCA data sources can also be used to calculate

Ideally, suppliers should use actual energy use data wherever possible to calculate Scope 1 and 2 emissions. While estimating energy use can help to provide a high-level understanding of emissions and impact, it can become difficult to demonstrate and substantiate impact reductions if estimates are not backed with actual improvements.

Data sources

Data sources for Scope 1 data may include:

- Actual fuel use data or purchase records (invoices) for on-site processes
- Emissions factors
- Soil carbon sequestration calculations if relevant (see below)
- Land use change or deforestation emissions (if relevant)

Data sources for Scope 2 data may include:

- Actual or estimated metre readings or costs from electricity providers.
- Actual or estimated usage or costs from steam providers.
- Renewable energy contractual agreements, energy attribute certificates, etc.
- Emissions factors

Data sources for Scope 3 data may include:

- Actual emissions data from direct or indirect suppliers or modelled impacts based on typical industry data
- LCA data for raw material inputs (accounting for waste)
- Chemical use data
- Feed inputs
- Other process inputs
- Emissions factors

Soil Carbon

For agricultural producers, soil carbon losses or gains can be relevant to calculating overall emissions. However, the approach to soil carbon accounting is still being refined, with updates to be launched soon for the GHG Protocol Land Sector Guidance. Some LCAs and other emissions calculations take into account soil carbon, but this is currently not easily verified. Detailed baselines, analysis and data are needed to demonstrate soil carbon benefits, so an agricultural producer may not be in a position to carry out this level of verification at this stage. Solutions are being developed, and this guidance will be updated to take account of the latest methodologies and recommendations as they develop.

SECTION 2: TARGET SETTING AND REPORTING

This section will describe the basics towards developing GHG emission reduction targets and reporting on your progress. For producers, gaining certifications on your materials can be the best way to set internal targets and demonstrate your progress to brand customers, who may also be willing to support your work through financial incentives or training resources. These programmes also provide a dual function of reporting, or validating, your progress to brand customers, meaning that producers save time and resources spent on reporting as a separate exercise.

The Fashion Pact signatories are committed to three goals that are relevant to tier 4 producers:

- Implementation of Science-based Targets for climate to achieve net-zero by 2050.
- By 2025, 25% of key raw materials are lower climate impact.
- Encourage implementation of renewables in all high impact manufacturing processes along the entire supply chain.

Industry actors may also benefit from the SBTi process of target setting on climate, as well as the emerging Science-based Targets for Nature (SBTN) guidance on setting targets for nature in synergy with climate to direct actions to nature positive and climate smart supply chains and sourcing.

Certifications and standards

Certification is a useful tool for producers to validate and communicate their sustainability claims about their raw materials. Particularly for tier 4 producers who are far removed from their brand customers, certification offers a way to verify your environmental practices and provide clear targets for you to work towards in your production practices. Working towards a certification or standard will also help you align with other industry producers and give greater credibility to your progress.

When deciding which certification is best for your operations, a good first step is to consider what these standards could add to your existing operations and how feasible each one is for your processes and raw materials. Learning about the promotional exposure of each programme and the customer demand for specific certifications is also important in making a decision.

Third-party certification is one of the strongest ways to ensure the integrity of your sustainability claims. In this system, an independent third-party (certification body) gives assurance that your practices and/or fibres are in conformity with requirements in a particular standard.

Fibre standards:

- Better Cotton Initiative (BCI)
- Fairtrade Certified Cotton
- Cotton Made in Africa (CMiA)
- Cotton Trust Protocol
- REEL
- ABRAPA
- MyBMP
- Fibershed's Climate Beneficial Verification
- Leather Impact Accelerator (LIA) (Note: LIA is not a standard but a benchmark)
- PEFC certification (for cellulosic fibres)
- FSC certification (for cellulosic fibres)

Organic standards:

- Organic Content Standard (OCS)
- Global Organic Textiles Standard (GOTS)
- US Organic
- EU Organic
- Soil Association
- National Programme for Organic Production in India
- Japan Agricultural Standard

Regenerative farming:

- regeneagri
- Regenerative Organic Certification

Recycled standards:

- Recycled Claim Standard (RCS)
- Global Recycled Standard (GRS)

Farm level certification:

- Responsible Wool Standard
- Responsible Mohair Standard
- Responsible Down Standard

Leather:

Programmes like the Leather Working Group and the Responsible Leather Round Table are incentivising improved practices for livestock production through standards, targets and knowledge sharing.

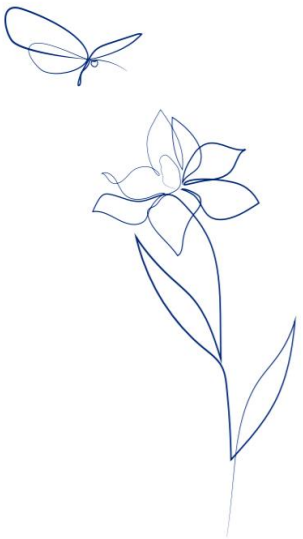
Wool and leather:

The Savory Institute's Frontier Founders Initiative is promoting regenerative grazing in food and fibre supply chains.

Viscose:

Zero deforestation commitments provide signals of intent and a basis for collaboration. The CanopyStyle initiative has helped to drive up the market share of viscose producers with policies to avoid sourcing feedstock from endangered forest from ~35% to ~84% since 2015.

Certification resources to use:



The following resources can be used to direct your decision-making process on which certification is best for your operations and to provide more information on the certification process:

- Textile Exchange Standards
- Approved Certification bodies for Textile Exchange standards
- Supplier Certification Toolkit by Textile Exchange
- CanopyStyle initiative
- Impact Incentives and Partnerships
- Farm Level certifications
- Cotton 2040

SECTION 3: TAKING ACTION

As well as gaining certifications to validate and communicate your progress, there are many actions that will help you take appropriate action. In general, shifting to sustainable agricultural and forestry practices in raw material production can significantly reduce your emissions and deliver huge cost savings, as well as creating benefits for the environment. Better practices can include the use of renewable energy, increasing energy efficiency of machinery, reducing chemical and water use, and adopting regenerative agricultural practices.

'Regenerative agriculture' is a key way to reduce your environmental impact. By definition, regenerative agriculture is a holistic land management practice that leverages the power of photosynthesis in plants to close the carbon cycle, and build soil health, crop resilience and nutrient density. It describes farming and grazing practices that, among other benefits, reverse climate change by rebuilding soil organic matter and restoring degraded soil biodiversity – resulting in both carbon drawdown and improving freshwater cycles. Regenerative agriculture is an example of Natural Climate Solutions (NCS), which scientists estimate can provide 30% of the solutions to climate change globally. Significantly, with the right enablers in place, regenerative production systems can also improve farm profitability and mitigate regulatory risks.

Reducing your impact - energy use

As mentioned earlier, onsite energy use (including machinery) is a key area for emissions reduction and efficiency gains to be created. Other uses of onsite energy could be for irrigation water and pre-spin production, such as fibre processing for synthetic or cellulosic fibres. Referred to as scope 1, or 'direct' emissions, these emissions can be easily addressed as the processes are likely to be under your own control. The following are some activities that can and/or should be considered in order to address onsite emissions (and costs), although solutions will vary based on your own farming processes and geographical location:

Renewables:

- Switching to renewable energy for irrigation.
- Deploy renewable energy for processes (e.g., polymerization).

Use of fertilizers and diesel:

- Improved agro-chemicals management (e.g. precision cropping with site specific management of nutrients, pesticides, and water; as well as computer-controlled livestock feeding).
- Fertilizers vs compost and type of compost are key drivers in GHG release on farms. On-farm fertilizer (manure) derived as a waste product (passive fertilizer application from owned cattle) is the best solution to bringing down impact.

- Doubling the application of manure-based nitrogen to replace fertiliser produced from natural gas could save USD 825 million and 2 831 billion litres of natural gas annually[1].
- Reduction in chemical use for animal and processing phases.
- Using alternative seed variants that require less water or pest control.
- Doubling the amount of no-till acreage (from 25 million hectares to 50 million hectares) could save farmers and ranchers an additional 821 million litres of diesel fuel per year, valued at about USD 500 million annually[2].
- Ensure all vehicle tyres are kept at the correct pressure to save diesel.
- Install a fuel meter on the farm diesel tank to monitor fuel usage.
- Consider soft-start technology for electric motors.

Energy efficiency upgrades:

- Switch to more efficient machinery.
- Producers with animal feeding operations can save up to USD 250 million nationwide each year by regularly maintaining their ventilation and heating systems and using more energy-efficient fixtures and equipment for animal housing[3].
- Including process optimisation and sub-metering to identify energy use peaks.
- Improving energy efficiency in cleaning and ginning processes by optimising machinery and sub-metering energy use to identify hotspots.

Water efficiency:

- More efficient irrigation systems: Improving water efficiency by just 10% could reduce diesel consumption by 102 million litres and save farmers and ranchers USD 55 million annually[4].
- Converting irrigation systems from medium- or high-pressure to low pressure could cut energy costs by up to USD 100 million annually[5].
- For intensive operations, dirty water can be applied using low rate irrigation, rather than tractor, to save 60% of the energy costs[6]. Diverting clean water from the slurry store can minimise slurry volumes and therefore reducing slurry handling that involves energy-intensive machinery.

Reducing your impact - farming practices

Regenerative farming practices:

- Adopting regenerative agricultural practices such as no-till soil management.

[1] OECD, 2017 - https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=COM/TAD/CA/ENV/EPOC(2016)19/FINAL&docLanguage=En

[2] USDA, Farm Energy Efficiency - https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/energy/

[3] USDA, Farm Energy Efficiency - https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/energy/

[4] USDA, Farm Energy Efficiency - https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/energy/

[5] USDA, Farm Energy Efficiency - https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/energy/

[6] Farm Carbon Toolki, Energy Efficiency Advice for Livestock Farmers - https://farmcarbontoolkit.org.uk/toolkit-page/energy-efficiency-advice-for-livestock-farmers/

- Reducing application overlap on 101 million hectares of cropland could save up to USD 825 million in fertiliser and pesticide costs annually, which would have knock-on effects on energy usage[7].

Forest practices:

- Setting aside part of forest land as protected areas where logging is prohibited and protect natural forests against deforestation; reduce the risk of fires, and take particular care to protect "high conservation value forests"; create a management plan that specifies the number of trees that can be harvested per acre, and the frequency at which this can occur, based on the growth and regeneration rate of the species found in that ecosystem – to ensure that forest carbon stocks are protected and that regrowth can sequester carbon at a rate that balances removals; use reduced-impact harvesting techniques that allow loggers to fell and extract trees in a manner that reduces damage to other trees in the stand.
- Comply with best available forest certification systems for wood-based raw materials and audit to avoid Ancient and Endangered Forests.

Case study:

Through participating in the Better Cotton Initiative (BCI) in 2018-19, farmers in China had 25% higher profits than non-BCI farmers. Similarly, BCI farmers in India and Pakistan had 11% higher yields than non-BCI farmers during this season. Reductions in resource use were also significant, as Pakistan farmers were found to use 15% less water than non-BCI farmers, and farmers in Tajikistan used 38% less pesticides than comparison farmers[8].

Resources to use:

- UN Fashion Charter - Identifying low carbon sources of cotton and polyester fibres report
- Textile Exchange Organic Cotton Farm Hub
- Textile Exchange Fibre and Materials Platform
- CottonInfo - Energy use Efficiency
- Farm Carbon Toolkit - Energy efficiency advice for livestock farmers
- Intensive cotton farming technologies in China: Achievements, challenges and countermeasures - Jianlong, Dai and Hezhong, Dong, 2017

[7] OECD, 2017 - https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=COM/TAD/CA/ENV/EPOC(2016)19/FINAL&docLanguage=En

[8] Better Cotton Initiative, 2019 - https://stories.bettercotton.org/bci-farmer-results--2018-2019/#group-Results-Overview-2DXPklUNzy

Reducing your impact - raw materials

Production and extraction of raw materials takes vast amounts of energy and can create severe negative impacts, not only related to climate. Several strategies exist to reduce the overall impacts of material use, although detailed assessments need to be performed to assess the opportunities and risks of these strategies. Many emissions can be addressed through switching to an improved source, or by ensuring that the fibre is covered by a certification scheme or improvement programme, which exist in many producer regions across the world.

Materials considered as lower impact:

Cotton:

Better Cotton Initiative, Fair Trade Certified, organic and recycled cotton

Synthetics:

Biobased and recycled polyester; recycled nylon

Animal-based fibres:

Leather working group, organic, recycled regenerative and chrome free leather; responsible/ ZQ-certified, recycled and regenerative wool; recycled down

Man Made cellulosics (MMC) and other natural fibres:

FSC/PEFC certified, closed-loop (e.g. REFIBRA) and recycled MMC as well as Lyocell; jute as well as organic and recycled linen and hemp

The suggestions below are separated into the most common raw materials, followed by some considerations for material efficiency.

- Wool – there is evidence that specific practices can improve impacts – such as changes in animal feed, switching to grazing only, grazing land that has not been converted, regenerative grazing practices and a reduction in chemical use for animal and processing phases. Joining programmes helping to reduce direct wool production impacts in specific regions may also reduce climate impacts.

- Cotton cultivation – solutions include: reducing irrigation use for cultivation or switching to renewable energy sources for irrigation; reducing chemical use in cultivation; using alternative seed variants that require less water or pest control; adopting regenerative agricultural practices such as no-till soil management; using renewable energy for on-site cultivation processes and cleaning/ginning processes; improving energy efficiency in cleaning and ginning processes by optimising machinery and sub-metering energy use to identify hotspots. Multiple programmes exist to reduce direct cotton production impacts in specific regions.

- Flax – solutions include: reducing irrigation use for cultivation or switching to renewable energy sources for irrigation; reducing chemical use for cultivation; using alternative seed variants that require less water or pest control; adopting regenerative agricultural practices such as no-till soil management; using renewable energy and pursuing energy efficiency for on-site cultivation processes and cleaning/processing.

- PLA – solutions include: reducing irrigation use for cultivation or switching to renewable energy sources for irrigation; reducing chemical use in cultivation; using alternative seed variants that require less water or pest control; adopting regenerative agricultural practices such as no-till soil management; using renewable energy for on-site cultivation processes and cleaning/ginning processes. Processing impacts can be reduced through implementing best practices such as chemical recovery and recycling; use of renewable energy sources; energy efficiency measures on-site, including process optimisation and sub-metering to identify energy use peaks.

- Polyester – solutions include: implementing best practices such as chemical recovery and recycling; use of renewable energy sources; energy efficiency measures on-site, including process optimisation and sub-metering to identify energy use peaks.

- Viscose – solutions include: avoiding the use of chemical pesticides; setting aside part of forest land as protected areas where logging is prohibited and protect natural forests against deforestation; reduce the risk of fires, and take particular care to protect "high conservation value forests"; create a management plan that specifies the number of trees that can be harvested per acre, and the frequency at which this can occur, based on the growth and regeneration rate of the species found in that ecosystem – to ensure that forest carbon stocks are protected and that regrowth can sequester carbon at a rate that balances removals; use reduced-impact harvesting techniques that allow loggers to fell and extract trees in a manner that reduces damage to other trees in the stand.

- Viscose processing– solutions include: implementing best practices such as chemical recovery and recycling; use of renewable energy sources; energy efficiency measures on-site, including process optimisation and sub-metering to identify energy use peaks.

Case study:

In 2019, Timberland (part of VF Corporation) announced a partnership with Other Half Processing to build a responsible leather supply chain from ranches that employ regenerative practices. Such practices, which entail managing cattle in a way that mimics the natural movement of herd animals, have the potential to build soil health, reduce carbon emissions, enhance biodiversity, improve water cycling, and improve farmer and rancher livelihoods.

APPENDIX: KEY TERMS AND CONCEPTS

- Adaptation: Refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts.
- Absolute emission reduction target: A target defined by reduction in absolute emissions over time e.g., reduces CO2 emissions by X% below 2018 levels by 2030.
- Avoided emissions: Emission reductions that occur outside of a product's life cycle or value chain, but as a result of the use of that product often in comparison to another product.
- Base year: A historic datum (a specific year or an average over multiple years) against which a company's emissions are tracked over time.
- Bioenergy: Energy derived from any form of biomass such as recently living organisms or their metabolic by-products
- Boundaries: GHG accounting and reporting boundaries can have several dimensions, i.e. organisational, operational, geographic, business unit, and target boundaries. The inventory boundary determines which emissions are accounted for and reported by the company.
- Carbon budget: For a given temperature rise limit, for example a 1.5°C or 2°C long-term limit, the corresponding carbon budget reflects the total amount of carbon emissions that can be emitted for temperatures to stay below that limit. Stated differently, a carbon budget is the area under a carbon dioxide (CO2) emission trajectory that satisfies assumptions about limits on cumulative emissions estimated to avoid a certain level of global mean surface temperature rise.
- Carbon intensity: The amount of emissions of CO2 released per unit of another variable such as gross domestic product, output energy use, transport, or agricultural/forestry products.
- Carbon pricing: The price for avoided or released CO2 or CO2e emissions. This may refer to the rate of a carbon tax or the price of emission permits. In many models used to assess the economic costs of mitigation, carbon prices are used as a proxy to represent the level of effort in mitigation policies.
- Carbon tax: A levy on the carbon content of fossil fuels. Because virtually all of the carbon in fossil fuels is ultimately emitted as CO2, a carbon tax is equivalent to an emission tax on CO2 emissions.
- Circular economy: A circular economy aims to redefine growth, focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital.
- Climate finance: Refers to local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change.
- Climate resilience: Climate resilience is the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks.
- CO2 equivalent (CO2e): The universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.

- Deforestation: Conversion of forest to non-forest.
- Emission factor: A factor allowing GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions.
- Emission hotspots: Areas along the value chain where emissions are particularly high or important.
- Emission pathway: The trajectory of annual greenhouse gas emissions over time.
- Energy efficiency: Using less energy to perform the same tasks.
- Global warming potential (GWP): An index representing the combined effect of the differing times greenhouse gases remain in the atmosphere and their relative effectiveness in absorbing outgoing infrared radiation.
- Greenhouse gas: The atmospheric gases responsible for causing global warming and climatic change. The major greenhouse gases are carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). Less prevalent, but very powerful, GHGs are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).
- Greenhouse gas inventory: A quantified list of an organization's GHG emissions and sources.
- Land use, land-use Change and forestry (LULUCF): A greenhouse gas inventory sector that covers emissions and removals of greenhouse gases resulting from direct human induced land use, land use change and forestry activities.
- Mitigation: In the context of climate change, a human intervention to reduce the sources, or enhance the sinks of greenhouse gases. Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings and expanding forests and other 'sinks' to remove greater amounts of CO2 from the atmosphere.
- Monitoring, reporting and verification: A process/concept that potentially supports greater transparency in the climate change regime.
- Nationally Determined Contribution (NDC): Submissions by countries that have ratified the Paris Agreement which presents their national efforts to reach the Paris Agreement's long-term temperature goal of limiting warming to well below 2°C. New or updated NDCs are to be submitted in 2020 and every five years thereafter. NDCs thus represent a country's current ambition/target for reducing emissions nationally.
- Nature based solutions: Actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.
- Offsetting: the action or process of compensating for carbon dioxide emissions arising from industrial or other human activity, by participating in schemes designed to make equivalent reductions of carbon dioxide in the atmosphere.
- Renewable energy: Energy taken from sources that are inexhaustible, e.g. wind, water, solar, geothermal energy, and biofuels.
- Science-based target: GHG emissions reduction targets are considered "science-based" if they are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement—to limit global warming to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C.
- Supply chain: The sequence of processes involved in the production and distribution of a commodity.

- Tipping-point: Tipping points are thresholds where a tiny change could push a system into a completely new state and are based on positive feedback loops, whereby an effect of something reinforces the cause.
- Value chain emissions: Emissions from the upstream and downstream activities associated with the operations of the reporting company.

(Sources: GHG Protocol Corporate Standard, IPCC AR5 Report, SBTi Manual, 2050 own definitions)