GETTING STARTED GUIDE FOR BRANDS

SUSTAINABLE MATERIALS

THIS IS A DRAFT DOCUMENT.

This guide is intended to be used as an educational tool and a starting point for action, with the goal of continuous improvement in brand sustainability practices as measured by the Higg Index Brand Environmental Module. It is each company's responsibility to apply this Guide in a way that is meaningful to their products and business. For more information or to join the Outdoor Industry Association's Sustainability Working Group, visit outdoorindustry.org/sustainable-business.

Date updated: July 2017 (Version 1 – DRAFT)

Relevant Higg Index Brand Environmental Module (BEM) 2.0 indicators:

MAT B-1: Materials Program

Also supports: MAT B-5, GEN B-1, GEN B-2, GEN B-3

Note: Updated BEM 3.0 chemicals management indicators are currently in development and scheduled to be released early 2018.

OUTDOOR INDUSTRY ASSOCIATION

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IN THIS GUIDE:

WHY DO MATERIALS MATTER?

GLOBAL TRENDS

Your company's materials usage is inextricably tied to global megatrends – climate change, modern slavery, peak oil, animal welfare, and toxic chemicals just to name a few. These trends may have a direct impact on your company, such as toxics in materials that require a product recall, material price spikes as a result of droughts that cause crop failures, or production delays and factory shutdowns due to regulatory non-compliance.

Non-profit organizations are in a stronger position than ever to impact the behavior of companies by reporting on issues like lack of transparency, the environmental and human health impacts of chemicals, mistreatment of workers, and cruel treatment of animals. Social media transmits these findings around the world before a company can respond or remedy the situation.

Millennials and Generation Z expect brands to take responsibility for the products they make, and may reward companies who do so. According to a 2015 global study by Nielson:

> "Despite the fact that Millennials are coming of age in one of the most difficult economic climates, a recent Nielsen global online study found that they continue to be most willing to pay extra for sustainable offerings—almost three-out-of-four respondents in the latest findings, up from approximately half in 2014.
>
> The rise in the percentage of respondents aged 15 to 20, also known as Generation Z, who are willing to pay more for products and services that come from companies who are committed to positive social and environmental impact was also strong—up from 55% in 2014 to 72% in 2015." [1]

A 2017 study found that the majority of Americans expect brands to take the lead in making progress on social and environmental issues. The 2017 Cone Communications CSR Study found that:

> "86% of Americans expect companies to take action on social and environmental issues"
>
> "For companies to gain attention and realize bottom-line benefits, they need to authentically build CSR into the brand experience – this means going beyond a CSR report, an ad campaign or page on the corporate website." [2]

Taking proactive steps to address the environmental, animal welfare, and social issues impacting materials, products, and the supply chain benefits brands directly:

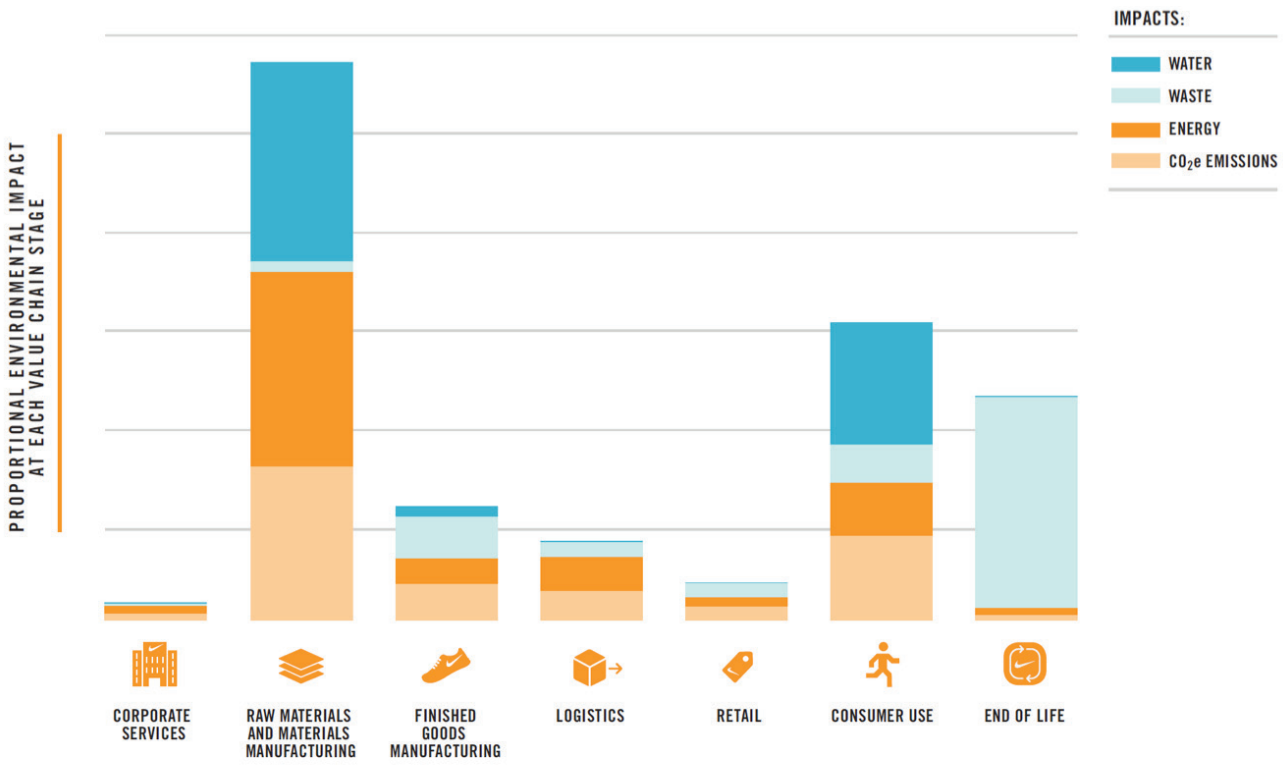
- **Create brand and product loyalty.** Awareness of environmental issues by consumers is on the rise. A growing number of consumers want to "do good" and serve their conscience in the purchasing decisions they make.
- **Meet transparency expectations.** Consumers and watchdog groups increasingly expect companies to be transparent and to substantiate marketing claims. Brands are being challenged by the media, consumers, and social/environmental organizations on the implications of their activities far back down the supply chain.
- **Decrease risk and liability.** Having a strong awareness and understanding of your supply chain allows you to better anticipate risks in a given region or material. Meeting global social and environmental compliance criteria reduces the chance of negative media attention, product recalls and supply chain disruption.
- **Reduce costs and improve quality.** Reductions in resource consumption and materials, such as water, energy or unnecessary harmful chemistries can reduce manufacturing costs. Products and materials produced using best management practices for environmental health and safety may be better quality – leading to reduced returns, defective and damage rates.
- **Comply with increasing legislation.** Laws and regulations impacting materials continue to increase each year. Not meeting this legislation may mean your products cannot be sold into specific countries and markets.
- **Protect the places we play.** Preserving our outdoor environment is essential for outdoor businesses and their customers.

MATERIALS MATTER

Taking steps to use environmentally preferable materials can protect and improve your company's reputation, reduce the environmental footprint of your products, reduce the impacts to people and communities, decrease the risk of regulatory non-compliance, and reduce the chance of negative media attention. A sustainable materials program is key to staying relevant in an evolving marketplace, keeping up with consumer demand, and meeting and increasing number of regulatory requirements.

The relative impact of materials compared to other parts of the value chain is visualized in the graph below from Nike's FY14/15 Sustainability Business Report. **Materials account for a significant portion of the impacts of a product** as can be seen in the graph below. Impacts include land use, habitat loss, animal welfare, water usage, wastewater pollution, air emissions, energy consumption, and greenhouse gas emissions. A 2015 State of the Apparel Sector Water Report estimated that **it takes over 20,000 liters of water to grow, treat, dye, and finish, one kilogram of cotton textiles**[3]. China Water Risk estimates that **20% of water pollution in China is from textile treatment and dyeing**[4]**.**

Graph 1: Nike FY15, Value Chain Footprint Impacts[5]



NOTE: Corporate Services includes all headquarter facilities and corporate travel. Logistics includes transportation and distribution centers.

The environmental impacts of materials can be addressed through the development of a sustainable materials program and the use of environmentally preferred materials such as recycled polyester, recycled rubber, recycled cotton, or organic cotton. For example, **using recycled cotton reduces water consumption by up to 80%** by eliminating the need for water intensive farming of cotton crops, according to Textile Exchange. A study by the University of Netherlands found that sourcing mechanically or chemically recycled polyester fibers results in a reduction in energy use of up to 85% and a reduction in a global warming potential of up to 76% compared to virgin polyester6.

Below are some foundational actions to begin establishing your sustainable materials program:

Know
Identify key materials and develop an inventory

- What are the roles, systems, and processes involved in material selection, development, sourcing?
- What do you use? Gather data on your highest volume materials

Assess
Impacts + opportunities

Act
Pursue solutions for top materials

Track
Establish a strategy, accountability and methods to track progress

FOUNDATIONAL ACTIONS

KNOW: DEVELOP A MATERIALS INVENTORY

Creating a successful sustainable materials program starts with understanding your key materials.

Start the process by **assessing the people, systems and processes** for selecting, developing, and sourcing materials at your company.

- Who is involved in material decisions – both internally (materials development, buying, design, sourcing, etc.) and externally (agents, factories, etc.)?
- What systems are used by your company to manage material data (Product Data Management Systems (PDMs), Product Lifecycle Management (PLM), Excel Spreadsheets, etc.)?
- What processes, steps, check-ins, or screenings are in place to screen new and ongoing suppliers and materials to ensure they meet your brand's requirements (quality, performance, price, delivery, social and environmental compliance, etc.)?

Once you have the above information, the next step is to determine your highest volume materials (top 5 to 10) that will be sourced long-term (several seasons).

Next, **create an inventory** of information for the top 5 to 10 materials. This information can be obtained through your current product and material data management systems (if available). An example of a Product Data Management (PDM) system is shown in Figure 1 below. If you do not currently collect this information you may need to work with your colleagues who manage your materials and/or reach out to your suppliers for data.

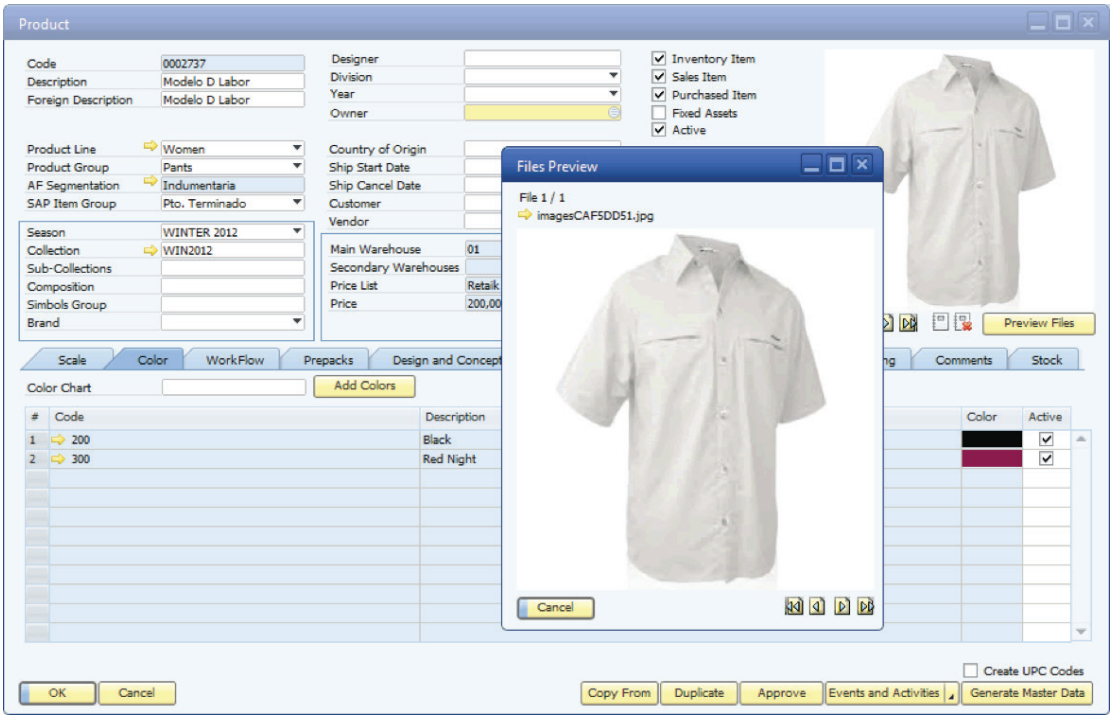
Your inventory might include some or all of the following:

- Material Name
- Supplier Name(s) and Specific Location(s) (Site Address)
- Content/Composition
- Country of Origin, if known
- Attributes and Specifications
- Weight
- Colorways
- Volume / Quantity per Season
- Dyeing Method
- Finishes
- Tanning Method (Leather only)
- Cost per Unit
- Performance and Quality Requirements
- Lead-time Requirements
- Minimum Order Quantity
- Long-term (several seasons) or short term (one or two seasons)
- Material's environmental attributes, certifications, etc.
- Supplier's environmental programs, certifications, etc.

Pro Tip:

You may need to talk to a variety of people and collect this information from several sources. Start with the person(s) responsible for developing, selecting, and/or sourcing materials.

Figure 1: Example of Product Data Management (PDM) System[7]



You are now ready to start the process to improve existing materials or find alternatives. The next step is to **understand the impacts of materials and some options to reduce those impacts.**

ASSESS: UNDERSTAND IMPACTS AND OPPORTUNITIES FOR IMPROVEMENT

Understanding the impacts of your materials enables you to identify meaningful opportunities for improvement. As mentioned previously, up to 70% of impacts of a product is from the materials – including water use, water pollution, energy use, air emissions, toxics and waste. Those impacts occur in each stage of the material creation - farming, ranching, extraction, dyeing, finishing, tanning, etc. In addition, for animal based fibers and materials (e.g., wool, leather, down, etc.) there may be animal welfare issues.

QUICK FACTS: IMPACTS OF MATERIALS + PROCESSES

See the Resources section at the end of this document for more information on each material. For a more in-depth understanding of materials and their impacts, see the Sustainable Apparel Coalition (SAC) Material Sustainability Index (MSI) and Textile Exchange's Materials Snapshots and Summaries:

- SAC's Higg Materials Sustainability Index (MSI): The Higg MSI enables companies to compare various materials, blends and production processes. You can leverage the information to get a clear understanding of impacts and how to reduce those impacts.
- Textile Exchange's Material Snapshots and Summaries: A library of material snapshots and summaries. The summaries provide insights into a range of common fibers and materials, the processes, and their impacts.

Conventional Cotton: It takes over 3,600 cubic meters of water to grow one ton of cotton in the top fifteen cotton producing countries8. This equates to over 9500 bathtubs full of water.

Polyester and Nylon: Large quantities of energy are used in the production of synthetics, which has far-reaching environmental implications, including the release of greenhouse gasses.

Rayon: The solvent used in the viscose rayon process called carbon disulfide is a toxic chemical that is a known human reproductive hazard posing dangers to factory workers, surrounding communities and the environment through air emissions and wastewater. In addition, rayon can lead to deforestation. Approximately 30% of the pulp that is used to make rayon comes from endangered and ancient forests[9].

Wool (Sheep): Overgrazing by herds of sheep can damage the pasture ecosystem and cause soil erosion and pollution to the rivers and streams. An issue that has gained much attention from animal rights groups is mulesing, a procedure entails cutting off the skin from the rumps of the lambs, often without painkillers.

Leather (Cow): According the U.S. EPA, manure from cattle is the fastest growing major source of the greenhouse gas, methane. In many developing countries, there is large scale and rapidly accelerating clear-cutting of rainforests due to cattle ranching. According to the report Slaughtering the Amazon, "every eight seconds, an acre of Amazon rainforest is destroyed in Brazil for cattle ranching, which is the biggest single driver of deforestation in the world."

Down: Two practices in particular have drawn the attention of consumers and watchdog group. Live-plucking is the action of removing the down and feather materials while the animal is still alive. Material gathered in this way is indistinguishable from non-live plucked material. Force-feeding is practiced in some regions to produce foie gras, a fatty liver considered a delicacy by many.

Textile Dyeing and Processing: There is up to 600 liters of wastewater from the creation of one kilogram of textile at a mill[10]. Generally, textile wastewater effluents are highly colored, saline and contain toxic compounds. As much as 65% of the chemicals used in the textile finishing process for cotton end up in the wastewater and 55% of the chemicals used for synthetics end up in the wastewater.

Many dyes present health risks to those working with them. The dyeing process generally involves a range of toxic chemicals such as dioxins, which are carcinogenic and possibly disrupt hormones; toxic heavy metals such as chrome, copper, and zinc, which are known carcinogens; and formaldehyde, a suspected carcinogen.

Other dyes or dye processes include heavy metals like copper, chromium or cobalt. Many dyes, including natural dyes, do not "adhere" to the fabric well enough to prevent a large amount of polluted water from being washed off the fabric after it is dyed. For example, the fabric retains only about 80% of direct dyes; the rest is flushed out from the garment.

Each year, the global textile industry discharges tens of thousands of tons of dyes into rivers and streams. Although this wastewater can be treated to remove the dye, salt and other toxic chemicals such as heavy metals, this treatment process is expensive and does not always occur.

Don't Get "Bamboozled"

Some materials that have been touted as more environmentally friendly that do not live up to their claims:

Bamboo Fabrics:

The process to make viscose rayon from bamboo is the same process used to produce viscose rayon from any other source. The cellulose is extracted from the bamboo, and then the cellulose is mixed with chemicals to convert the plant pulp into textile quality fiber. This process can be very polluting[11]. The U.S. FTC has fined companies for making unsubstantiated environmental and performance claims regarding bamboo rayon[12].

Biodegradable and Compostable Materials

Biodegradable and compostable materials have environmental impacts throughout their lifecycle that should be considered before sourcing these materials[13]. Research has found that most of these materials do not actually break down in rivers, in oceans, or on land or they break down into smaller pieces that are just as dangerous to animals and the environment[14]. The U.S. FTC has fined companies for making misleading and unsubstantiated biodegradability claims[15].

See Resources section at the end of this document for more information on the above materials/processes.

PREFERRED MATERIAL OPTIONS, STANDARDS AND CERTIFICATIONS

Fortunately, there are many materials and processes that have lower impacts and address environmental, animal welfare, and social issues. Leading brands have paved the way and more and more suppliers are offering environmentally preferable materials. Ideally a preferred material meets the following criteria:

- Adheres to a recognized standard or certification (vs. "self-declaration," see "Definitions" below)
  - » A standard is a set of criteria developed through a formalized multi-stakeholder process.
  - » A credible standard should be verified by an independent third-party certification body, and should have publically available information about the standard and companies certified to the standard.

AND

- Is objectively tested or verified as having reduced impacts or sustainability attributes
  - » Verification of impact reduction or sustainability attributes may range from self-declared, brand verified, or independent, third-party verification.

Preferred Material Options, Standards, and Certifications examples

(this is only a small sampling and not meant to be an all-inclusive list):

RECYCLED MATERIAL (Recycled Polyester, Nylon, Cotton, Rubber, etc.)

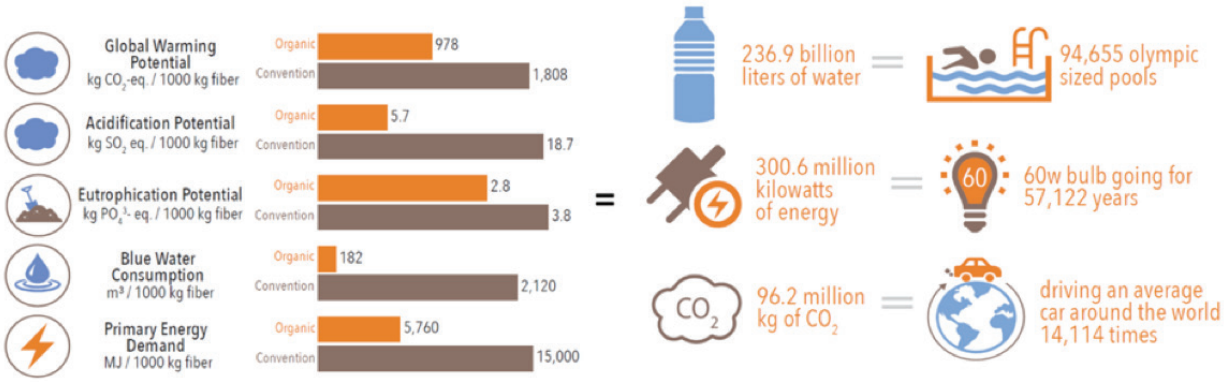
Recycled standards and certifications promote the use of materials made from pre-consumer (also called post-industrial) and/or post-consumer waste materials and products such as plastic bottles and manufacturing scraps. Recycled materials reduce consumption of oil and take less energy to produce. The certifications and standards address traceability through the supply chain to ensure the recycled material ends up in the finished product.

- **Recycled Claim Standard (RCS):** The RCS is a chain of custody standard to track recycled raw materials through the supply chain. RCS verifies that materials were actually diverted from a waste stream and categorizes the recycled material as made from pre-consumer or post-consumer waste.
- **Global Recycled Standard (GRS):** GRS is a holistic certification for products with recycled content. The desired effect of the GRS is to provide brands with a tool for more accurate labeling, to encourage innovation in the use of reclaimed materials, to establish more transparency in the supply chain, and to provide better information to consumers. The same input requirements and chain of custody of the RCS are combined with social, environmental, and chemical processing requirements.

COTTON

There are many standards and certifications that address some or all the impacts related to cotton, including pesticide and fertilizer use, water use, soil health, impacts to surrounding waterways and the natural environment, worker chemical exposure, working conditions, and chemical exposure to surrounding communities. Most standards address traceability through the supply chain to ensure the certified raw material ends up in the finished product.

Figure 2: Organic versus Conventional Cotton Compariso[16]



Organic Content Standard (OCS):

- The OCS uses third-party certification to verify that a final product contains the accurate amount of an organically grown material. The OCS uses the chain of custody requirements of the Content Claim Standard.

Global Organic Textile Standard (GOTS):

- The aim of GOTS is to define world-wide recognized requirements that ensure organic status of textiles, from harvesting of the raw materials, through environmentally and socially responsible manufacturing up to labeling in order to provide a credible assurance to the end consumer.

Better Cotton Initiative (BCI) Cotton:

- BCI is a holistic approach to sustainable cotton production that covers all three pillars of sustainability: environmental, social and economic. The system is designed to ensure the exchange of good practices, and to encourage the scaling up of collective action to establish Better Cotton as a sustainable mainstream commodity.

Cotton made in Africa (CmiA) Organic Standard:

- The CmiA Organic Standard builds on the existing organic standards but also includes the social and economic production criteria of CmiA. In this way, CmiA Organic not only adds ecological value in many regions of Africa, but this inclusion of social and economic components in the standard also helps to reduce poverty and improve food security for organic cotton farmers in Africa and to boost the competitiveness of organic cotton sourced from Africa.

ANIMAL BASED FIBERS/MATERIALS HUMANE TREATMENT AND/OR ENVIRONMENTAL STANDARDS/CERTIFICATIONS

These standards and certifications address issues pertaining to the treatment and well-being of animals, including thirst, hunger and malnutrition, comfort, shelter, distress, diagnosis and treatment of diseases; ability to display normal patterns of behavior; and their treatment at the end of life. They may also address the environmental impacts related to ranching, including pesticide and fertilizer use, water use, soil health, and impacts to surrounding waterways and the natural environment. Some of the standards address the water use, wastewater, energy use, air emissions, and chemical use during the processing and creation stage of the materials. Most standards address traceability through the supply chain to ensure the certified raw material ends up in the finished product.

Responsible Down Standard (RDS):

- RDS ensures that down and feathers come from ducks and geese that have been treated well. This means enabling them to live healthy lives, express innate behaviors, and not suffer from pain, fear or distress. The standard ensures there is no live-plucking or force-feeding of the animals, which are critical issues in the industry. The standard also follows the chain of custody from farm to finished product, so consumers can be confident that the down and feathers in the products they choose are truly RDS certified.

Responsible Wool Standard (RWS):

- The RWS standard addresses animal welfare, land management, and chain of custody. RWS ensures that wool comes from farms with a progressive approach to managing their land, and from sheep that have been treated responsibly. It provides a robust chain of custody system from farm to final product.

MATERIAL CREATION PROCESSING – LOW IMPACT PROCESSES STANDARDS/CERTIFICATION

These standards and certifications address the impacts of material creation and production processing, such as mills, dye houses and washing facilities, sundry suppliers, tanneries, outsole manufacturers, embroiderers, screen printers, trim suppliers, etc. including subcontractors. They address issues such as water use, wastewater, air emissions, energy use, chemical use, and worker health and safety.

- **Higg Index Facility Environmental Module 3.0 (FEM):** The FEM assesses and measures the environmental performance of suppliers, including fiber and material manufacturers. The FEM assesses environmental management systems, energy use and greenhouse gas emissions, water use, wastewater, air emissions, waste management, and chemicals management at production facilities.
- bluesign Certification: bluesign certified textiles are made exclusively of a combination of components that have been evaluated for resource productivity, consumer safety, water emissions, air emissions, and occupational health and safety. The OIA offers its member brands discounted access to join the bluesign system. Learn more.

- Global Organic Textile Standard (GOTS): GOTS covers the processing, manufacturing, packaging, labeling, trading and distribution of all textiles made from at least 70 percent certified organic natural fibers. The final products may include, but are not limited to fiber products, yarns, fabrics, clothes and home textiles.
- Sustainable Textile Production (STeP): STeP is a textile certification that covers the production facilities of all processing stages from fiber production, spinning mills, weaving mills, knitting mills to finishing facilities and manufacturers of ready-made textile items. STeP analyzes chemical management, environmental performance, environmental management, occupational health and safety, social responsibility and quality management at the facilities.
- Leather Working Group Protocol: The Leather Working Group has created a protocol that rates tanneries based on their chemical and water management, energy use, greenhouse gas emissions, waste management, and cow hide traceability.

INDICES – MEASURING & COMPARING IMPACTS OF MATERIALS

Indices enable users to compare the environmental performance of materials. Indices can be used to understand the environmental performance of current materials, and assess changes or alternatives in order to inform better decision-making.

- Higg Material Sustainability Index (MSI): The MSI is a cradle-to-gate tool created by the Sustainable Apparel Coalition (SAC) that enables users to assess and score materials. The MSI provides an overall score for each material. Scores can be sorted by each type of impact (e.g., Water Scarcity, Land Use, Climate Change, etc.). The MSI tool enables the user to compare materials to each other as well test how to improve a material by changing processes (e.g. dyeing method, construction method, etc.) or content (e.g., recycled content, organic content, etc.).

  The value of the Higg MSI tools for brands is that it provides a scalable way to understand the environmental performance of the materials and the material suppliers. Using the MSI scoring system, brands can make more informed decisions around materials and product development. The MSI:

  » Enables companies to compare their materials against others

  » Can be used to empower product development teams to make more sustainable choices during materials selection

ACT: EXPLORE SOLUTIONS FOR TOP MATERIALS

Once you've built an inventory of your materials and understand impacts and opportunities, the next step is to explore solutions for your highest-priority materials.

GETTING STARTED USING THE MSI

If you are just starting on a sustainable materials program you can begin by using the SAC's Material Sustainability Index (MSI) to evaluate impacts and compare materials. Comparing materials using the MSI is quick and easy. The MSI is a credible, science-based tool developed through a multi-stakeholder process. It eliminates the requirement for your company to develop its own internal tools and databases that could take years and cost tens of thousands of dollars.

Detailed instructions can be found in the Learn More section of the Higg MSI

1. Create scenarios (based on top 5 to 10 current materials identified in Step 1 and materials you aspire to use)
   » Start the comparison by using the generic materials available in the MSI library.
   » A more advanced step is to create customized materials in the MSI. This provides greater accuracy for your specific materials. This approach is more time intensive and may require partnering with your suppliers to obtain data and information for the supply chain, material content, and production processes.
2. Analyze/compare materials
   » Review and compare the MSI scores of the materials to assess options for improving existing materials or sourcing new materials. Keep in mind that a lower score is better in the MSI.
3. Share/inform your colleagues
   » Review and compare the MSI scores of the materials to assess options for improving existing materials or sourcing new materials. Keep in mind that a lower score is better in the MSI.
4. Decide on material options to pursue
   » Determine the best options to pursue based on MSI Scores, cost, availability, performance, and your company's values.

Once you've decided on material options to pursue the next step is to explore material and supplier options:

5. Start the conversation with your current suppliers
   - » Ask current suppliers what environmentally preferred materials they offer
   - » Ask current suppliers about their environmental practices, if they have been audited by any other brands, or meet any standards
   - » Send your suppliers the Higg Index Facility Environmental Module (FEM) and ask them to complete the assessment and exchange results.
6. Look for alternative suppliers
   - » Use organizations such as Textile Exchange and bluesign to find material suppliers that provide environmentally preferred materials.

Consider:

- Are materials with environmental attributes available from multiple sources (suppliers/countries) so you are not dependent on one supplier?
- Do the materials meet price, quality, performance and delivery requirements?
- Are the environmental attributes of the material proven and verified (See step 2)?
- Is 100% content of an environmentally preferable material feasible or is a blend of 5, 10, 20 or 50% more feasible due to price and margin constraints?

CASE STUDY

Brooks Sports - Challenge or confirm your assumptions about sustainable materials in 30 minutes or less

The apparel team at Brooks Running wanted to improve the environmental performance of their t-shirts. Brooks was considering a variety of options, but was not sure of the best path. Brooks turned to the Higg MSI tool for quick and credible guidance.

Here's what they did:

1. Created material scenarios in MSI
   - » Selected several materials from the MSI base material library based on Brooks' current material portfolio and potential materials
   - » Explored scenarios for each material – variations to content, processes, blends, environmental attributes (certified organic, recycled content, bluesign certified, etc.)
2. Analyzed and compared MSI scores
   - » Produced a list of 15 material scenarios and their MSI scores
   - » Compared scores of each material scenario
3. Shared results
   - » Material list and scores were shared internally with the apparel team
   - » Scores enabled apparel team to discuss options

Conclusions:

The apparel team had initially thought that transitioning their t-shirts to a natural fiber would be a more sustainable materials choice, but MSI base material data showed that polyester scored better than cotton. As Brooks continues to develop their t-shirt program the MSI is playing a role in helping shape more sustainable materials choices including attributes like recycled content and bluesign certification.

TRACK: ESTABLISH A STRATEGY, ACCOUNTABILITY AND METHODS TO TRACK PROGRESS

Once you have generated momentum through some internal wins by improving a few materials in your products (as described above), it is critical to set an overall strategy, set goals and track improvements.

1. **Develop your strategy. Creating an overall strategy ensures there is a roadmap to guide your materials program. When developing a strategy:**

   Determine your "North Star" objective.

   - Consider how the objective protects and enhances your brand reputation, promotes material innovation, reduces impacts of materials, etc.

   Set goals.

   - When developing goals ensure they are "S.M.A.R.T."
     - Specific
     - Measurable
     - Achievable
     - Relevant
     - Time Bound
   - Consider setting ambitious goals (e.g., 100% recycled content). Setting ambitious, but realistic goals creates focus and a sense of urgency, which in turn impacts organizational priorities
   - Example goals:
     - X% of materials will have X% recycled/organic content by [DATE]
     - X% of material suppliers meet X standard or certification by [DATE]

   Determine actions required to achieve your goals.

2. **Establish accountability and integrate responsibilities throughout the business.**

   Who needs to be involved?

   - Roles and responsibilities should extend to the buyers, materials developers, designers, product managers and key decision makers.

   Determine how they need to be involved

   - Day-to-day responsibilities, overall approval, sign-offs, etc.
   - Define the role for each persons and team/department

   Make people and teams/department accountable

   - Build accountability into job requirements, annual reviews, department goals, etc.

3. **Consider how to integrate sustainability into business systems, processes and decision making, including integration into:**

   Material and product data management systems

   - Integrate additional fields into your company's existing material and product tracking systems and databases such PDMs, PLMs, spreadsheets, etc. These may include the items listed in "STEP 1" as well as:
     - % Certified Organically Grown (% and link or attachment to certification)
     - Animal Husbandry/Care Certification (% and link or attachment to certification)
     - Ranching/Farming Certification - other than organic (% and link or attachment to certification)
     - Recycled Content (% and link or attachment to certification)
     - Processing Standard/Certification (link or attachment to standard/certification)
     - MSI Score
     - Other Certifications, Standards or Environmental Attributes

Supplier data systems

» Keep an updated list of all suppliers that provide materials for your products. Consider including:
  - Location(s)/address(es) of production facilities
  - Types of processes on site
  - Environmental programs, certification, etc.
  - Criteria from the SAC Facilities Environmental Module (FEM)

Sourcing decisions and tracking

» Integrate sustainability into new supplier requirements and reviews of current suppliers.

Material selection, purchasing and developing decisions

» Integrate into key dates and gates for material selection and development

4. **Track and report on progress.**
Tracking progress over time enables you to assess your programs, materials, product teams, and suppliers and make adjustments based on successes and challenges. Integrating sustainability metrics into existing internal reports (known as balanced scorecards) ensures these topics stay top of mind.

5. **Create policies and document procedures.**
Formalize policies and procedures in written documents. Policies and procedures ensure consistency through the business and that programs continue to thrive after personal changes.

» Procedures should document the steps to manage, improve, and track materials and material suppliers – expanding on and expanding the steps outlined in this guide.

» Policies may include requirement or specifications for materials (e.g., Certified Organic, Recycled Content, Responsible Wool Standard, etc.) and material suppliers.

» Consider having leadership sign the policies to give them more weight

WHAT'S NEXT?

PRODUCT DESIGN

The Sustainable Apparel Coalition (SAC) estimates that designers and developers can control upwards of 80% of a product's environmental impact. Therefore, there are significant opportunities to reduce the impacts through the product design and creation process.

Examples of how this can be accomplished include:

Material Efficiencies / Waste Reduction. Decreasing the amount of materials needed to make a product reduces costs, as well as the energy, water, and chemicals needed to make the materials. Material use can be reduced by:

- Improving marker efficiency
- Decreasing number of layers, excess trims, extra overlays and underlays, and extra parts, etc.
- Consolidating parts and materials where possible
  - » Use the same material or part for multiple styles
- Designing for a single color to eliminate the need to purchase extra materials
- Incorporating modularity such using the same vamp or sock liner for various styles
- Using injection (e.g., direct phylon – pellets to part) instead compression molding
- Simplify molding and minimize the number of colors
  - » Complex constructions greatly increase the chance of off spec product because they are more likely to get stuck in mold and be damaged during manual flash cutting
  - » Minimizing the number of colors in injection molded pieces reduces color bleeding – color bleeding is a common issue that results in off spec product

Long-life products. Creating products that will be used for longer durations prevents the need to consume resources to create new protects. Examples of how this can be accomplished:

- Designing durable products
  - » Consider durability issues for both the material and construction
- Creating timeless designs
  - » Consider how to design a product that a consumer will want to keep for many years
- Making products repairable
  - » Ensuring products can be easily and cost effectively repaired at home or at accessible locations
- Design for end of life
  - » Consider the ultimate fate of the product at the end of its useful life. Do consumers have access to the infrastructure and technology to recycle the materials? Can the materials be easily separated for recycling?

ASSESSING PRODUCTS USING DDM

If you are just starting out in integrating sustainability into product design and development decisions you can begin by using the Sustainable Apparel Coalition's (SAC) HIGG Design & Development Module (DDM) to evaluate impacts and compare materials. Comparing product designs using the DDM is quick and easy. The DDM provides design teams straightforward guidance on reducing the impact of a product. The DDM is meant to be used very early in the product creation process, before the impact has already been made by producing a sample.

You can begin the DDM product scoring process by clicking on "Create a New Product" in the top of your Product Library. Once you fill in some basic product information, you will be directed to a product assessment. This is where you can answer a few quick questions under the following topics:

- Materials
- Manufacturing
- Care & Repair
- End of Use
- Quality & Lifetime

If your materials are already set up in the MSI, scoring a product should take 2-3 minutes. The SAC recommends taking a few steps first to get the most out of your Higg DDM experience:

1. Set up your brand's seasons
2. Set up brand-specific product descriptions you want to include in your product information
3. Create your material library
4. Set up your trim library
5. Create product templates

LIFE-CYCLE ASSESSMENTS (LCA)

An LCA measures the environmental impacts through all the phases of a product's or material's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and end of life.

LCAs will typically follow a globally accepted standard such as ISO14040[17] and include:

- Goal and scope: Objectives and the boundaries (how wide and deep to go) for the LCA.
- Life cycle inventory phase: Catalog of all inputs and outputs in a product's life cycle, starting with the composition of a product, where the materials originated, where the materials end up, and every input (e.g. raw materials, energy, water, etc.) and output (air emissions, greenhouse gas emissions, wastewater, hazardous waste, etc.) for each material and step in the process.
- Life cycle impact assessment phase: Environmental impacts identified in the previous stage are calculated (e.g., impacts of withdrawing water from a river for a production process and hazardous waste generated for a production process). Life cycle analysis generates metrics that represents the impacts to the environment.
- Life cycle interpretation phase: Summary of the life cycle inventory and life cycle impact assessment phase and recommendations. Includes identifying hot spot / significant issues, recommendations and conclusions.

A full LCA can take many months to over a year to complete and cost between $30,000 to $100,000 (USD) or more. While an LCA can provide insights into the impacts of a product the benefits of an LCA may be outweighed by the cost and time requirements. An LCA is also a very specific snapshot of a specific supply chain and requires an immense amount of data to be collected. The cost and time required for an LCA might be more effectively used to rollout sustainability initiatives based on the tools, information, analysis that is available through industry coalitions such as the Textile Exchange and the Sustainable Apparel Coalition. These groups have a library of research, analyses, and tools available at a small fraction of the cost of an LCA. These resources provide the guidance and direction needed to make informed decisions about materials and products. Many of these resources incorporate the analysis and results from LCAs completed by credible third parties.

KEY RESOURCES

Textile Exchange:

Textile Exchange (TE) is a global non-profit that works to drive industry transformation in preferred fibers, integrity and standards, and responsible supply networks. They identify and share best practices regarding farming, materials, processing, and traceability to reduce the textile industry's impact on the world's water, soil and air, and the human population. TE provides information and resources for materials with preferred environmental attributes. TE is a great place to start on your pursuit of more sustainable materials. They offer tools, guidance and support for many materials, including:

- **Standards and Certifications:** Standards and certifications are one of the most powerful transparency tools in the industry. Textile Exchange works with the industry to create standards that verify and track best practices in farming, animal welfare, and product processing.
- **Supply Network:** Services to help brands map out their supply network from raw materials to final assembly. Resources include tools to sourcing preferred materials and best practices in supply network management, and development of regional sourcing strategies — from raw material procurement through final production.
- **Material Snapshots and Summaries:** A library of material snapshots and summaries. The summaries provide insights into a range of common fibers and materials, the processes, and their impacts.
- **Stakeholder Platforms:** These platforms and working groups aim to bring together members of the supply chain to address barriers, share best practices, create new ways of doing business and grow the preferred fibers and materials market.
- **Industry Benchmarking and Sector Report:** Yearly benchmarking initiative developed collaboratively with participants to encourage companies to continuously improve their performance and uptake of preferred fibers and materials.

Sustainable Apparel Coalition (SAC):

The Sustainable Apparel Coalition (SAC) is an organization representing approximately 40% of the global apparel, footwear, and home textiles market. It is comprised of over 175 brands, retailers, manufacturers, academic experts, government, and non-governmental organizations that are working to lead the industry towards a more sustainable future. The SAC is creating a common language and coordinating harmonized efforts for the textile and footwear Industry through the Higg suite of tools, and welcomes any partnership, with national or regional organizations, to reach this goal. Transparency between brands and suppliers, as well as consumers, is a strategic priority of the SAC to encourage the development of more sustainable products and processes. They have created a suite of Higg Index Tools.

Impacts of Materials and Processes:

The following are examples of some common materials and their key impacts:

Conventional Cotton

Conventional cotton farming uses approximately 25% of the world's insecticides and more than 10% of the pesticides, including herbicides, insecticides, and defoliants. The Environmental Protection Agency (EPA) considers seven of the top 15 pesticides used on cotton as "possible," "likely," "probable," or "known" human carcinogens (acephate, dichloropropene, diuron, fluometuron, pendimethalin, tribufos, and trifluralin). Cotton is also a very water intensive crop. **It takes over 3,600 cubic meters of water to grow one ton of cotton in the top fifteen cotton producing countries**[18]**. This equates to over 9500 bathtubs full of water.**

Polyester and Nylon

The extraction of oil to create petrochemicals is required to produce common synthetics used in the outdoor industry, including polyester, nylon and acrylics. **Large quantities of energy are used in the production of synthetics, which has far-reaching environmental implications, including the release of greenhouse gasses.**

Rayon

Rayon, a cellulosic raw material is manufactured from sources such as paper, bamboo or wood pulp, via a chemical-intensive process. The growing of trees and bamboo for these materials contributes to deforestation and pollution in developing countries.

The solvent used in the viscose rayon process called carbon disulfide is a toxic chemical that is a known human reproductive hazard posing dangers to factory workers, surrounding communities and the environment through air emissions and wastewater. Approximately half of the carbon disulfide solvent used in the process to make rayon ends up in the environment. Sodium hydroxide and sulfuric acid are other hazardous chemicals used in the viscose process[19].

Wool (Sheep)

Overgrazing by herds of sheep can damage the pasture ecosystem and cause soil erosion and pollution to the rivers and streams. Pesticides utilized during the sheep dip application are highly water-soluble and can runoff into streams and rivers. Soil erosion and pesticides can lead to fish die-offs and damage to the aquatic ecosystem. Ranching practices can also have negative impacts to the wildlife, for example some ranches have aggressive policies to exterminate all predators in the area, such as coyotes and wolves.

Issues pertaining to the well-being and humane treatment of sheep have also come to the forefront for the wool industry. **An issue that has gained much attention from animal rights groups is mulesing.** Mulesing is used to prevent fly-strikes in areas where blowflies are common such as in Australia. Mulesing is a procedure that causes immense pain. The procedure entails cutting off the skin from the rumps of the lambs, often without painkillers.

Leather (Cow)

Raising cattle can have big impacts to the environment. The manure from cattle releases nitrous dioxide, nitrogen, phosphorus, and methane. **According the U.S. EPA, manure from cattle is the fastest growing major source of the greenhouse gas, methane.** The manure can leach nitrogen and phosphorus into the groundwater and rivers.

In many developing countries, there is large scale and rapidly accelerating clear-cutting of rainforests due to cattle ranching. Deforestation causes serious erosion issues, the land eventually becomes worthless after a few years, and the rainforest will not regrow. **According to the report Slaughtering the Amazon, "every eight seconds, an acre of Amazon rainforest is destroyed in Brazil for cattle ranching, which is the biggest single driver of deforestation in the world."** Brazil's cattle industry is responsible for about 80 percent of the deforestation.

There are also issues pertaining to the well-being and humane treatment of cattle. While most cattle are raised outdoors, finishing farms may require cattle to be more tightly confined in poor conditions. Some feedlots may feed a grain-based diet, which is unnatural for cattle, and causes discomfort, illness, or even death[20].

Finally, the conventional chrome-based method of tanning leather often results in high volumes of very toxic water pollution that impacts people and the ecosystem.

Down

Frequently used as an insulation, down is the by-product of the meat industry, and is a relatively low-impact material. However, as an animal-derived material, animal welfare practices may be of concern. **Two practices in particular have drawn the attention of consumers and watchdog group. Live-plucking is the action of removing the down and feather materials while the animal is still alive. Material gathered in this way is indistinguishable from non-live plucked material. Force-feeding is practiced in some regions to produce foie gras, a fatty liver considered a delicacy by many.**

Textile Dyeing and Processing

Textile processes use water, energy, dyes, auxiliaries, chemicals, detergents and finishing agents in the conversion of raw materials to finished product. **There is up to 600 liters of wastewater from the creation of one kilogram of textile at a mill[21].**

Generally, textile wastewater effluents are highly colored, saline and contain toxic compounds. As much as 65% of the chemicals used in the textile finishing process for cotton end up in the wastewater and 55% of the chemicals used for synthetics end up in the wastewater.

Many dyes present health risks to those working with them. The dyeing process generally involves a range of toxic chemicals such as dioxins, which are carcinogenic and possibly disrupt hormones; toxic heavy metals such as chrome, copper, and zinc, which are known carcinogens; and formaldehyde, a suspected carcinogen.

Other dyes or dye processes include heavy metals like copper, chromium or cobalt. Many dyes, including natural dyes, do not "adhere" to the fabric well enough to prevent a large amount of polluted water from being washed off the fabric after it is dyed. For example, the fabric retains only about 80% of direct dyes; the rest is flushed out from the garment.

Each year, the global textile industry discharges tens of thousands of tons of dyes into rivers and streams. Although this wastewater can be treated to remove the dye, salt and other toxic chemicals such as heavy metals, this treatment process is expensive and does not always occur.

Don't Get "Bamboozled"

Some materials that have been touted as more environmentally friendly that do not live up to their claims:

Bamboo Fabrics

These materials claim to be more environmentally friendly because they are made from bamboo. The reality is that bamboo plantations are replacing critical forests and habitat. The process to make viscose rayon from bamboo is the same process used to produce viscose rayon from any other source. The cellulose is extracted from the bamboo, and then the cellulose is mixed with chemicals to convert the plant pulp into textile quality fiber. This process can be very polluting[22]. The U.S. FTC has fined companies for making unsubstantiated environmental and performance claims regarding bamboo rayon[23].

Biodegradable Materials

Biodegradable materials have environmental impacts throughout their lifecycle that should be considered before sourcing these material[24]. Research has found that most materials that claim to be biodegradable do not break down in rivers, in oceans, or on land[25]. If they do break down it may only be into smaller pieces that cause as much or more harm to wildlife and the ecosystem[26]. Even if degradation were to occur in landfills the effect would be to increase production of landfill gases, including the potent greenhouse gas, methane, as well as landfill leachate, which is a liquid slurry that can contaminate groundwater and create an acidic landfill environment that enhances the leaching of toxic constituents from other materials[27]. Degradability is likely detrimental to recycling by contaminating the recycling stream. The U.S. FTC has fined companies for making misleading and unsubstantiated biodegradability claims[28].

DEFINITIONS

Organic: Grown without the use of synthetic pesticides, herbicides, fertilizers or defoliants at any point during its growing season. For animal fibers, no feed treated with synthetic chemical pesticides or fertilizers, with restricted use of antibiotics and growth hormones, and according to strict animal husbandry guidelines. IFOAM is a leading international organization for the promotion of organic agriculture. IFOAM defines Organic Agriculture as a production system that sustains the health of soils, ecosystems and people; relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects; and combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.

Transitional Organic (or in-conversion): Most national organic standards require that land designated for organic certification must be pesticide or chemical free for three years prior to certification. Transitional organic refers to any material produced during the period of transition to organic certification.

Better / More Sustainable Cotton: BCI, CMiA, REEL, E3 as examples. Often GMO neutral, farmer training, implementing best practices (low/no till, preserving topsoil, reducing water usage, etc.)

Cellulosic Fibers (e.g. Tencel): Fibers extracted from pulp from trees. Preferred man-made cellulosics come from verified sources (e.g. best practices in agriculture methods, yield, and environmental protection). Only increased transparency and traceability will allow customers to ensure that fiber origin is not from ancient and endangered forests, endangered species habitat, controversial sources, or illegally logged. Preferred cellulosics should also have a method to recapture the chemicals used during processing. This greatly reduces the potential environmental impact. Lenzing's Tencel is a leading preferred cellulosic.

Recycled Content: Material separated or otherwise recovered from a waste stream for use in the form of raw materials, in the manufacture or assembly of a new materials or products. Mention mechanical versus chemical recycling and bottles versus apparel and home furnishings.

Recycled Material: Material that has been reprocessed from reclaimed material by means of a manufacturing process and made into a final product or into a component for incorporation into a product.

> **Post-Consumer Material:** Material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product that can no longer be used for its intended purpose. This includes returns of materials from the distribution chain.
>
> **Pre-Consumer Material** (or Post-Industrial): Material diverted from the waste stream during the manufacturing process. Excluded is the reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

There is a wide variety of materials that may be suitable for recycling, including plastic from consumer beverage bottles, used textiles, cutting scrap from cutting rooms, metal, or even glass. Chemical recycling may be more intensive, but may also result in higher quality, longer lasting material. Mechanical recycling is the most common method of recycling cutting room scraps.

Standard: A standard is a set of norms established by an independent organization, and may cover anything from the source of the fiber, to all aspects of production, including environmental impacts, social conditions, packaging and quality. The standard will often be backed up by a logo (with labeling guidelines) that indicates it has been certified to that standard. Companies choose to be certified to voluntary standards in order to provide additional assurance for themselves and their customers.

Chain of custody: A system to document and guarantee the path taken by a defined raw material through all stages of transfer and production, to the final product. The chain of custody preserves the identity of the raw material. This can be done through a system of scope certificates and transaction certificates that follow the product through each stage, or a system that manages the flow of goods through data collection at each stage of the supply chain.

Traceability: The ability to trace the history, application or location of a given material. Note that in general tracing refers to going backward through time and the supply chain, while tracking refers to moving forward through time and the supply chain.

FOOTNOTES

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