ECOTEX

Learning materials

Circular Economy Innovative Skills in the Textile Sector

Intellectual Output 4

Module 1

Sustainability Management

Dec 2019

Module 1: Sustainability Management

Index

Introduction to the module

The Textile and Clothing supply chain is segmented, long, complex and often lacks transparency – therefore, it is important to implement the principles of sustainable development in order to improve environmental and social performance. Module 1 is an introductory module for the sustainability expert learn about sustainable business organization principles in order to be able to manage and coordinate sustainability procedures and maintain processes according to good practices, policies and standardization.

Unit 1.1 Sustainability definition and policies

1.1.1 Introduction

This unit provides an insight into the definition and concept of sustainable development, explains main dimensions of sustainability, and draws the attention to the relevance and importance of the topic. This unit outlines the basic principles and goals of global sustainability policies.

1.1.2 Short description

Knowledge	Skills	Competencies
At the end of this unit the in-company trainer will:	*At the end of this unit the in-company trainer will be able to:*	*At the end of this unit, the in-company trainer will have acquired the responsibility and autonomy to:*
• Knows the definition of sustainability: Environmental sustainability; Social sustainability; Economic sustainability; Sustainable raw materials; Sustainable production; Sustainable product. • Knows the sustainability policies.	• Develops sustainability policies in the enterprise; • Defines sustainability and assesses the ways that sustainability topics are approached by the textiles and clothing sector. • Defines the textile Value Chain.	• Understands the basic sustainability concepts covering the Planet, People and Profit (3P) issues and the application of those concepts in textiles and clothing sector. Understands the definition and particularities of Sustainable Materials and Production.

1.1.3 Content unit

Topic 1.1.3.1 Sustainability definition

The Cambridge Dictionary defines the term "sustainability" as follows: **Sustainability** [noun]:

- the quality of being able to continue over a period of time
- environment: the quality of causing little or no damage to the environment and therefore able to continue for a long time
- the idea that goods and services should be produced in ways that do not use resources that cannot be replaced and that do not damage the environment in order to be able to continue over a period of time
- the ability to continue at a particular level for a period of time

The milestone for the development of the sustainability concept and movement was the "Brundtland Commissions" final report "Our Common Future" in 1987, which defines sustainable development as: development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability is a holistic approach that considers ecological, social and economic dimensions, recognizing that all must be considered together to find lasting prosperity.

The definition of "sustainability" is the study of how natural systems function, remain diverse and produce everything they need for the ecology to remain in balance, meaning meeting one's needs without compromising the ability of future generations to meet their own needs. The concept includes three main dimensions (3P): environment (Planet); society (People); economy (Profit).

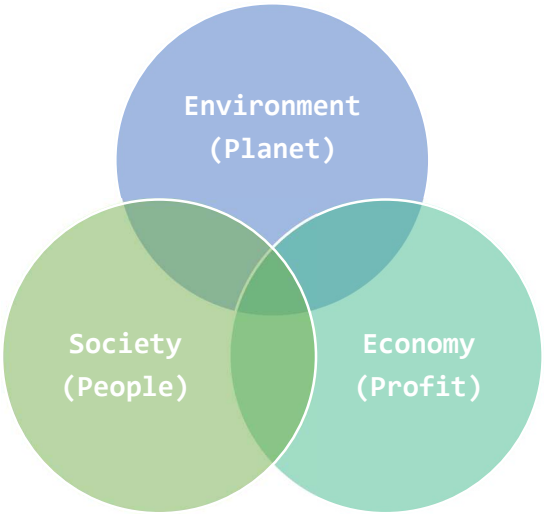

Figure 1. Dimensions of sustainability

The concept of sustainability is relatively new, starting to form by the end of the 20th century, coming from such movements as social justice and equality, conservationism, internationalism and others. In the times where most of the countries struggled with low living standards and extreme poverty, it was essential to find a way to provide wealth and

prosperity in the long-term without harming the ecological system of the Planet (consequences of industrialization).

Real case example: H&M. Strategy. Sustainability 360º

Scope	#sustainability #strategy #brand
Value added	**H&M's** global sustainability department consists of more than 30 experts – setting different aspects (strategies, targets, goals, policies and follow-up procedures for ensuring systematical sustainability work). Persons in charge of every retail market and H&M group function – more than 150 people employed to work specifically with sustainability. Focus on five stages within H&M value chain: design, material choice (use of several types of recycled materials – cotton, polyester, nylon, wool, cashmere, plastic, silver and down. H&M has specific sourcing policies for raw materials and collaboration with industry experts), production processes (chemical management, water management), product use (creation of long-lasting products. Take Care concept – to enable customers in caring for their clothing – from the moment of purchase to the time they bring them back to reuse and recycle), product re-use and end use by recycling (collection of unwanted textiles (from any brand, in any condition) in H&M stores (started 2012). 50-60% sorted for re-wear or reuse. About 35-45% of textiles are recycled).  **Source of information and image: Web site H&M Group Sustainability Report 2018. Vision&Strategy. Nov 2019**
More information	https://about.hm.com/en/sustainability.html https://sustainability.hm.com/content/dam/hm/about/documents/masterlanguage/CSR/2018_sustainability_report/HM_Group_SustainabilityReport_2018_Chapter2_Vision%26Strategy.pdf

Other sources mention that the idea of sustainability originated from the concept of sustainable development which became common language at the World's first Earth Summit in Rio in 1992. Nevertheless, there is no universally agreed definition on the term "sustainability". See some quotes on sustainability and sustainable development below:

- "A process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations"[1]
- "Sustainable development is a dynamic process which enables people to realize their potential and improve their quality of life in ways which simultaneously protect and enhance the earth's life support systems"[2]
- "In essence sustainable development is about five key principles: quality of life; fairness and equity; participation and partnership; care for our environment and respect for ecological constraints - recognizing there are 'environmental limits'; and thought for the future and the precautionary principle"[3]
- "The environment must be protected… to preserve essential ecosystem functions and to provide for the wellbeing of future generations; environmental and economic policy must be integrated; the goal of policy should be an improvement in the overall quality of life, not just income growth; poverty must be ended and resources distributed more equally; and all sections of society must be involved in decision making"[4]
- "We cannot just add sustainable development to our current list of things to do but must learn to integrate the concepts into everything that we do"[5]
- "A sustainable future is one in which a healthy environment, economic prosperity and social justice are pursued simultaneously to ensure the well-being and quality of life of present and future generations. Education is crucial to attaining that future."[6]
- "The first and perhaps most difficult problem, one that seldom gets addressed, is the time frame…Is a sustainable society one that endures for a decade, a human lifetime, or a thousand years?"[7]

Real case example: Patagonia. Facility Sustainable management

Scope	#Sustainable Supply Chain #brand
Value added	**Patagonia** –Their criteria for the best product rests on function, reparability, and, foremost, durability. Among the most direct ways the company tries to limit ecological impacts is with goods

[1] The World Commission on Environment and Development, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52001DC0264
[2] Forum for the Future, https://www.forumforthefuture.org/sustainability-and-system-change
[3] Making London Work" by Forum for the Future's Sustainable Wealth London project (2001)
[4] The Politics of the Real World: Meeting the New Century (Real World Coalition), (1996)
[5] The Dorset Education for Sustainability Network, https://www.sustainabledorset.org/
[6] Learning for a Sustainable Future - Teacher Centre, http://www.unesco.org/education/tlsf/
[7] Don Worster (1993), 'The Shaky Ground of Sustainable Development', in Don Worster (ed.), The Wealth of Nature, New York: Oxford University Press, pp. 142–55

	that last for generations or can be recycled so the materials in them remain in use. They're supporting other supply chain partners to develop new recycling methods and ways to incorporate nontraditional raw materials (such as old fishing nets) and helping by funding research into future materials biobased, biodegradable and even carbon positive. Additionally, Patagonia support environmental active campaigns. **Source of information: Web site of Patagonia -Company info. Nov 2019**
More information	https://www.patagonia.com/our-business.html https://eu.patagonia.com/ee/en/company-info.html

Topic 1.1.3.2 Environmental Sustainability

Such concepts as zero-waste thinking, recycling, green-living, eco-friendly production and lifestyle etc. are growing more and more popular, gathering nature loving activists all over the world, since Climate Change is considered to be the most urgent global concern of the future of humanity. The destruction of individual animals, species, habitats and whole ecosystems (including rainforests, coral reefs) is becoming a common problem. It is crucial to ensure that the essential diversity of all forms of life in the biosphere is maintained. In order to achieve that, Global policies and national legislations try to for example regulate businesses to prevent pollution and keep carbon emissions as low as possible. Main priorities are:

- High ecological integrity;
- Balance between prosperity and all ecological systems;
- Limited (reasonable) consumption of natural resources (at a rate of self-replenishment), high resource productivity;
- Use of renewable resources instead of fossil energy, recycling of non-regenerative resources;
- Circular economy, zero-waste thinking, recycling;
- Development of biotechnology.

Real case example: Jeanologia - Denim finishing

Scope	#zero water #denim finishing #Textile machinery
Value added	**Jeanologia** – It is an innovative company with over 20 years of expertise within the development of sustainable and eco-efficient technologies for the finishing industry. Today Jeanologia leads the transformation of the textile industry with its disruptive technologies (laser and eco systems) that enhance productivity,

	reduce water and energy consumption and eliminate damaging emissions and waste, guaranteeing ZERO pollution. Their mission is to create an ethical, sustainable and eco-efficient textile & clothing industry. **Source of information: Web site of Jeanologia. Nov 2019**
More information	https://www.jeanologia.com/aboutjeanologia/

Topic 1.1.3.3 Social Sustainability

The social dimension of sustainability is focused on people. In a business perspective, the social sustainability is related with the identification and management of the organization impacts on the society, which includes employees, local communities, workers in all value chain, clients, final consumers, etc. Main priorities can include:

- Social justice and equality (universal human rights, attainability of basic necessities);
- Fair labour practices;
- Health care and security;
- Empowerment;
- Balance between work and life;
- Education.

Topic 1.1.3.4 Economic Sustainability

Quoting world famous fashion designer and fierce environmental activist Vivienne Westwood "What is good for the Planet is good for the Economy. What is bad for the Planet is bad for the Economy…Buy less, choose well, make it last!"[8]

Economic sustainability proves to be the most problematic dimension, since the dominating quality that describes it is Profit – globally, politically, business-wise. The market is based on consumerism, being able to sustain the living, that modern day person is used to, takes enormous resources. Global economic philosophy should be focused on long-term, comprehensive, eco-sensitive cycles of return. Main priorities are:

- Economic independence;
- Equal access to the resources to meet one's needs;
- Balance between prosperity and all social and ecological systems;
- Promotion of Circular economy.

[8] https://www.youtube.com/watch?v=L9-8en9WdDM

Topic 1.1.3.5 Sustainability policies

The 2030 Agenda for Sustainable Development (United Nations, 2015)[9] sets the following 17 goals:

- **No poverty** – inclusive economic growth to provide sustainable jobs and promote equality, advanced social protection systems.
- **Zero hunger** - a profound change of the global food and agriculture system, investments in agriculture, sustainable food production systems.
- **Good health and well-being** - ensuring healthy lives and promoting the well-being at all ages.
- **Quality education** - improving quality of life, access to inclusive education.
- **Gender equality** - providing women and girls with equal access to education, health care, decent work, and representation in political and economic decision-making processes, implementing new legal frameworks regarding female equality in the workplace and the eradication of harmful practices targeted at women.
- **Clean water and sanitation** - increased investment in management of freshwater ecosystems and sanitation facilities.
- **Affordable and clean energy** - universal access to energy, increased energy efficiency and the increased use of renewable energy.
- **Decent work and economic growth** - sustainable economic growth will require societies to create the conditions that allow people to have quality jobs that stimulate the economy while not harming the environment. Increased access to financial services to manage incomes, accumulate assets and make productive investments, increased commitments to trade, banking and agriculture infrastructure.
- **Industry, innovation and infrastructure** - investments in infrastructure – transport, irrigation, energy and information and communication technology.
- **Reduced inequalities** - increase in duty-free treatment and continuation of favoring exports from developing countries, innovations in technology.
- **Sustainable cities and communities** - improving resource use, reducing pollution and poverty, increasing municipal waste collection.
- **Responsible consumption and production** - promoting resource and energy efficiency, sustainable infrastructure, providing access to basic services, green and decent jobs and a better quality of life for all.
- **Climate action** – adoption of the Paris Agreement at the COP21 in Paris.

[9] The 2030 Agenda for Sustainable Development (2015) - https://www.un.org/sustainabledevelopment/sustainable-development-goals/

- **Life below water** – effective managing of marine protected areas, regulations to reduce overfishing, marine pollution and ocean acidification.
- **Life on land** – reasonable use of resources, financial investments in support of biodiversity.
- **Peace, justice and strong institutions** - efficient and transparent regulations, comprehensive, realistic government budgets, implementation of worldwide birth registration and the creation of more independent national human rights institutions around the world.
- **Partnerships for the goals** - partnerships between governments, the private sector and civil society built upon principles and values, a shared vision, and shared goals that place people and the planet at the centre.

Figure 2. Sustainable development goals

The Paris Agreement (2015)[10] - brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. The central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century below 2°C above pre-industrial levels, as well as to strengthen the ability of countries to deal with the impacts of climate change.

To reach these ambitious goals, appropriate financial flows, a new technology framework and an enhanced capacity building framework will be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their own national objectives. The Agreement also provides for enhanced transparency of action and support through a more robust transparency framework.

[10] The Paris Agreement (2015) - https://unfccc.int/sites/default/files/english_paris_agreement.pdf

1.1.4 Suggested readings

- Brundtland Commission's final report Our Common Future (1987) – http://www.un-documents.net/wced-ocf.htm
- The Universal Declaration of Human Rights (1948) - https://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf
- The Rio Earth Summit Summary (1992) - http://publications.gc.ca/Collection-R/LoPBdP/BP/bp317-e.htm
- The Paris Agreement (2015) - https://unfccc.int/sites/default/files/english_paris_agreement.pdf
- The 2030 Agenda for Sustainable Development (2015) - https://www.un.org/sustainabledevelopment/sustainable-development-goals/; https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E
- https://www.environmentalscience.org/sustainability
- https://www.globalfootprints.org/sustainability/
- https://ec.europa.eu/epsc/events/sustainable-europe-2030_en

1.1.5 Quiz

Self-evaluation Quiz

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1. What are the three main dimensions of the sustainability concept? (select the most suitable option)
    a. Environment, Pollution, Philosophy
    b. Environment, Society, Economy
    c. Society, Politics, Economy
2. Which document could be considered as the milestone for the development of the sustainability concept? (select the most suitable option)
    a. "Brundtland Commissions" final report "Our Common Future" (1987)
    b. The Universal Declaration of Human Rights (1948)
    c. The Paris Agreement (2015)
3. When and where the World's first Earth Summit took place? (select the most suitable option)
    a. Paris, 2015
    b. Rio, 1992
    c. London, 1987

4. How many goals have been set by the United Nations in the 2030 Agenda for Sustainable Development? (select the most suitable option)
    a. 17
    b. 12
    c. 15
5. Which agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects? (select the most suitable option)
    a. The Paris Agreement
    b. The Rio Earth Summit Summary
    c. The 2030 Agenda for Sustainable Development

Unit 1.2 Sustainable Development (Business Models)

1.2.1 Introduction

This unit provides an insight into the history concept of sustainable development, as well as describing the environmental, social and economic problems in textile and clothing industry, highlighting the necessity and benefits of introducing the circular economic model. Alternative approaches and projects to improve the sustainability of the industry are considered.

1.2.2 Short description

Knowledge	**Skills**	**Competencies**
At the end of this unit the in-company trainer will:	*At the end of this unit the in-company trainer will be able to:*	*At the end of this unit, the in-company trainer will have acquired the responsibility and autonomy to:*
• Knows tools for sustainable business modeling and Sustainable Business Modeling Processes.	• Develops a business sustainability strategy for reducing negative environmental impacts, like decreasing of the amount of waste in the environment; not releasing toxins, greenhouse gas	• Understands the processes and regulations of business models in terms of sustainability; internalizes all external costs; creates no toxic, or otherwise harmful, outputs. • Designs and manages

	emissions and persistent pollutants; for reducing amount resources mined out of the earth's crust, and improving social responsibility, considering society in general and company workers and clients in particular.	business development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

1.2.3 Content unit

Topic 1.2.3.1 Sustainable development

In the modern world (mostly urban), the consumerist society uses/ wastes a lot of natural resources every day. Nowadays we consume a lot more power than few decades ago, especially in urban centers, in order to maintain and/or increase living standards. It is estimated that we use about 40% more resources every year than we can replenish[11]. Environmental damage, pollution, destabilizing soils by cutting down trees, fossil fuels and other environmental issues led to a growing concern about the environment.

Living within our environmental limits is one of the central principles of sustainable development. Sustainable development focuses on balancing between economic and technological progress and the necessity to minimize the negative impact on the environment, it also pays attention to harmonizing social imbalance, trying to find long-term solutions for environmental, social and economic problems.

In 2012, the United Nations Conference on Sustainable Development met to discuss and develop a set of goals to work towards:

- The end of poverty and hunger;
- Better standards of education and healthcare (water quality and better sanitation);
- To achieve gender equality;
- Sustainable economic growth while promoting jobs and stronger economies;
- Tackling the effects of climate change, pollution and other environmental factors that can harm and do harm people's health, livelihoods and lives;
- Sustainability to include health of the land, air and sea.

The United Nations was founded after World War II and in 1945. In the same year UNESCO (United Nations Educational, Scientific and Cultural Organization) was established to

[11] https://www.environmentalscience.org/sustainability

promote the importance of human culture and science. Their priority is "to contribute to the building of peace, the eradication of poverty, sustainable development and intercultural dialogue through education, the sciences, culture, communication and information"[12].

Only by the late 20th century, the science of climate change was established. Such global problems as the greenhouse effect, destruction of the ozone layer, exhaustion of the fossil fuels were identified and explored only relatively recently, inspiring the idea of moving towards renewable methods of power and trying to minimize the catastrophic impact on the environment. Hence transforming society and the economic system to more sustainable basis is the biggest challenge of our time. The ultimate objective of establishing the concept of sustainability as an organizing principle for the planet is to foster a well-functioning alignment between individuals, society, the economy and the regenerative capacity of the planet's life-supporting ecosystems.

As previously described sustainable development means interaction between economic growth, social inclusion and environmental protection. Only close and well-organized interaction between these dimensions can make the difference and achieve well-being of all living species on the planet.

TOPIC 1.2.3.2. Environmental, social and economic problems in the textile and clothing industry

The textile and clothing industry is a multi-trillion dollars' world-wide industry, employing more than 300 million people. Each year, this industry consumes more than 70 billion m^3 of water, more than 30 billion l of crude oil, using more than 40 million t of chemicals in all supply chain stages, becoming one of the most polluting industries. Around 25% of these hazardous chemicals are released into waterways killing the underwater ecosystems[13][14]. 14 million workers earn as much as 3 dollars a day, for more than 180 million work in health and life-threatening conditions, most of the production is made in low- and middle-income countries with still developing environmental regulatory and labour protection systems[15].

The number of times a garment is worn before it ceases to be used has decreased by 36% compared to 15 years ago[16]. A large portion of garments especially those bought on sale are thrown out without ever been worn at all. While garment is not of much value for the person it is an enormous burden and damage for the environment and the lower parts of the supply chain.

[12] https://en.unesco.org/about-us/introducing-unesco
[13] Ellen MacArthur Foundation, A new textiles economy: Redesigning fashion's future, (2017, http://www.ellenmacarthurfoundation.org/publications)
[14] http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI(2019)633143_EN.pdf
[15] https://www.globalfashionagenda.com/initiatives/pulse/#
[16] Ellen MacArthur Foundation, A new textiles economy: Redesigning fashion's future, (2017, http://www.ellenmacarthurfoundation.org/publications)

By 2017 only 2% of the world's textile and clothing factories participate in a sustainable or ethical certification scheme, while 85% of fashion brands show a poor sustainability performance. At the same time sales are incredibly high (more than 100 billion items of clothes sold annually), proving the low awareness of the consumer to the environmental and social aspects[17][18]. The impact on the environment of the linear economy model is devastating.

The negative impact areas, considering the environmental and social issues are represented in the following figure:

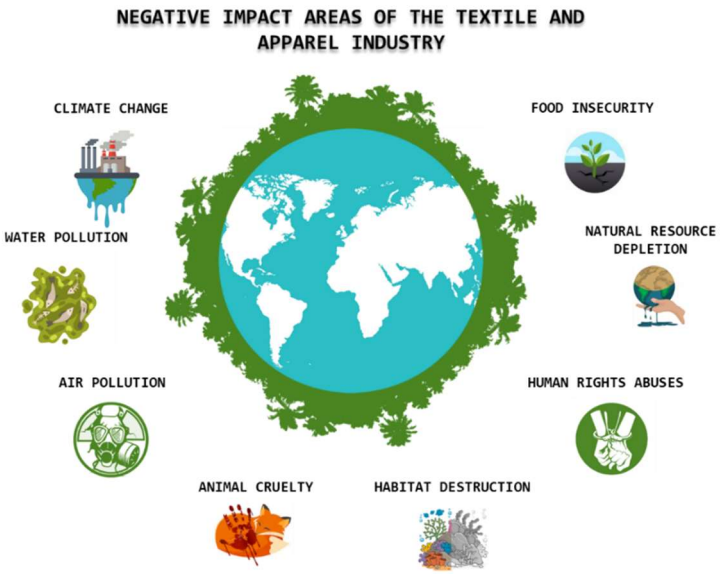

Figure 3. Negative impact areas of the textile and clothing industry

The next tables show some facts and figures[19,20,21] as well as proposed solutions for each of the issues related with the social and environmental negative impacts of the textile and clothing industry:

Issue	Facts and figures	Proposed solutions for businesses
Chemicals	~ 8000 chemicals used to turn raw materials into final products; 20% of water pollution from textile dyeing and finishing; Usage of 4% of pesticides and 10% of insecticides in fibre growing process; Hazardous chemicals in finished products;	Mapping the likely risks in the chemicals of raw materials and avoid their use. Mapping the likely risks in the supply chain, know the traceability and have controls of the chemical use and management. Use materials, dyes and fabrics that meet third party certification

[17] https://www.apparelentrepreneurship.com/your-guide-to-sustainability/
[18] https://www.globalfashionagenda.com/initiatives/pulse/#
[19] https://www.un.org/sustainabledevelopment/sustainable-development-goals/
[20] https://www.globalfashionagenda.com/initiatives/pulse/#
[21] Ellen MacArthur Foundation, A new textiles economy: Redesigning fashion's future, (2017, http://www.ellenmacarthurfoundation.org/publications)

Issue	Facts and figures	Proposed solutions for businesses
		standards such as the Global Organic Textile Standard (GOTS), STANDARD 100 by OEKO-TEX®, bluesign® or the EU Ecolabel; Use raw materials that avoid the use of pesticides and insecticides. Collaboration with programs such as Zero Discharge of Hazardous Chemicals (ZDHC); Replacing hazardous chemicals with safer alternatives; Use technologies and processes with less chemical intensity. Creating effective treatment systems for effluent.

Real case example: DETOX TO ZERO by OEKO-TEX®

Scope	#Sustainable Supply Chain #Zero Hazardous Chemicals
Value added	**DETOX TO ZERO by OEKO-TEX®** is a comprehensive verification and reporting system that uses the requirements stipulated by the Greenpeace Detox Campaign, which aims to eliminate all hazardous chemicals from the textile supply chain by 2020. DETOX TO ZERO program is on continuous improvement by analysing the situation within a facility and creating a robust plan to reduce hazardous substances in the production processes while implementing environmental protection procedures. **Source of information: Web site of OEKOTEX**
More information	https://www.oeko-tex.com/en/our-standards/detox-to-zero-by-oeko-tex

Issue	Facts and figures	Proposed solutions for businesses
Energy	6th largest emitter of greenhouse gases; 3% of globally produced carbon emissions; By 2030, on current trends, emissions from production are set to rise 60%, reaching an estimated 2,8 billion tones of CO_2; The use of freight transport is set to triple by 2040.	Mapping the likely risks in the supply chain, know the traceability and have controls of energy management and carbon footprint. Encouraging consumer awareness and behavior change; Sourcing raw materials from certified sustainable sources; Using renewable energy sources Supporting energy efficiency for farmers and producers; Improving efficiency of electricity use in manufacturing and transportation

		process; Collecting and recycling heat energy generated through production processes; Supporting supply chain partners with a commitment to energy efficiency; Considering the total lifecycle of the product at the product design stage, and the durability of the product; Providing to consumers energy efficient care instructions;

Real case example: Energy efficiency in a weaving factory

Scope	#Energy #Textile industry #Weaving factory
Value added	Textil Ortiz is a weaving company that creates efficiency and green energy model consumption to try to reduce the costs and has less environmental impacts through analyse the most consumption dispositive installing and change this machinery for other saving 105,31 Tep/year. Additionally, the mill was installing two wind turbines and roof solar panels and the mill monitored processes and main energy consumption machines in order to assess the energy consumption.  **Source of information and image: Web site of Textil Ortiz. Nov 2019**
More information	http://www.textilortiz.com/en/sustainability-3-0

Issue	**Facts and figures**	**Proposed solutions for businesses**
Water Pollution	20% of water pollution comes from textile dyeing and finishing; The release of microfibre plastics into land-based ecosystems, is equivalent in volume to around 4 million to 7 million plastic bags per day; A single garment made of synthetic fabric can produce more than 1.900 plastic-containing microfibres during every wash, depending on the fabric blend;	Considering environmental impacts at the design stage of products; Mapping the likely risks in the supply chain, know the traceability and have controls of wastewater management. Select supply chain according with low water footprint and not water pollution risks. Select raw materials and product according with less microfibers. Choosing certified sustainable materials; Looking for best available technologies in dyeing and finishing

		processes with less harmful chemicals; Recycling water, preferably in closed loop systems Encouraging customers to reduce their own impacts through careful washing

Real case example: Cross Industry Agreement

Scope	#water pollution #microplastics #agreement
Value added	 The Cross Industry Agreement (CIA) is a voluntary collaboration for the prevention of microplastic release into the aquatic environment during the washing of synthetic textiles. **Source of information and image: Web site of Euratex Nov 2019**
More information	https://euratex.eu/cia/

Issue	Facts and figures	Proposed solutions for businesses
Waste	Fashion industry creates around 13 kg of fashion waste for every person on the planet every year; The average consumer buys 400% more clothing than 20 years ago; Less than 1% of clothing and ~ 20% of textiles are being recycled; The average piece of clothing lasts for 3,3 years before being discarded;	Adopting a circular economy approach to product design, production and marketing of products, identifying where waste can be reduced, and textiles can be recycled or re-used; Improving accurate forecasting and specifications with suppliers to reduce errors leading to waste during production; Promoting consumer recycling of garments and textiles – from garment collection points, textile recycling directions, fashion exchanges and upcycling programmes.

Issue	Facts and figures	Proposed solutions for businesses

Modern slavery	58% of people in slave labour are found in China, India, Pakistan, Bangladesh and Uzbekistan; US Department of Labor research identifies 19 countries where forced labour has been found specifically in garment or jewellery supply chains; In Uzbekistan, an estimated 1 million adults and children were forced to work in the fields during the 2015 cotton harvest; Many of the women working in the spinning and textile mills of Tamil Nadu, southern India, are brought there under a type of bonded labour known as the "Sumangali Scheme".	Mapping the likely risk or potential for forced labour or modern slavery in their own supply chains, and investigating measures to prevent it; Raising awareness with employees, partners, suppliers or customers of the risk of forced labour, and running training programmes to ensure more effective prevention, detection and remediation; Supporting initiatives to strengthen local legislation to create broad momentum for the eradication of modern slavery; Using raw materials with certified or proved origin;

Issue	**Facts and figures**	**Proposed solutions for businesses**
Child labour	~152 million children trapped in child labour globally; Child labour is found in 51 countries in at least one part of the cotton, garment and jewellery supply chains;	Mapping the existence and potential risk of child labour occurring in their own supply chains; Working with suppliers and production sites to ensure good quality policies and training on child labour are in place; Ensuring their purchasing practices reflect the need for adequate adult wages and responsible employment practices; Supporting policies and programmes to provide a transition into decent education for any children found in child labour; Having clear policies and training programmes in place to ensure all workers are aware of the laws and what these stipulate; Ensuring active monitoring of the implementation of their own policies; Collaborating in local or sector-wide initiatives with other children's rights or labour organizations to build a culture of child wellbeing where they operate.

The textile and clothing industry's supply chains are very complex and fragmented. In order to change the negative impact on the environment and society, a cross-industrial collaboration on a global level is needed, among suppliers, producers, retailers, as well as at government and legislative level.

Topic 1.2.3.3 Circular Economy approach

The existing economic model is based on linear economic approach and has a hugely negative economic, social and environmental impact. Therefore the industry needs to change to a more sustainable economic model – circular approach starting from product design and throughout all the supply chain stages, ensuring suitable quality from raw materials to finished products, long-term usage of the products and re-entering used products back in the supply chain, thus reducing the amount of previously described issues of the textile and clothing industry[22].

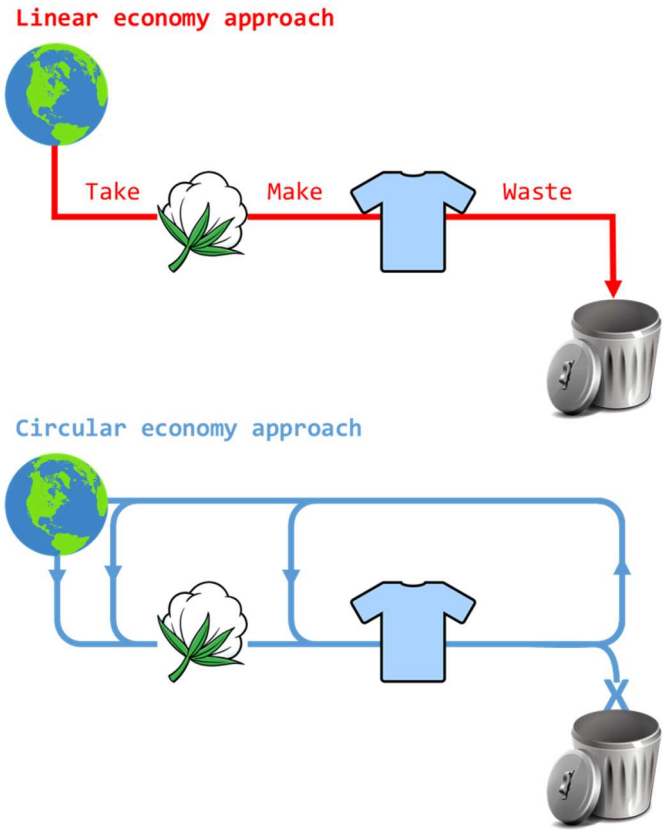

Figure 4. Differences between linear and circular economy approaches

Circular economy is based on three principles[23]:

[22] https://www.researchgate.net/publication/326546054_Circular_Economy_-_Challenges_for_the_Textile_and_Clothing_Industry
[23] Ellen MacArthur Foundation, A new textiles economy: Redesigning fashion's future, (2017, http://www.ellenmacarthurfoundation.org/publications)

- Excluding waste and pollution;
- Keeping resources in use (designing durable, reusable, recyclable products);
- Regenerating natural systems (avoiding the use of non-renewable resources, enhancing renewable resources).

Real case example: Ecoalf fashion from sea waste

Scope	#Recycled materials #brands
Value added	**ECOALF** (Spain) – Ecoalf is a sustainable fashion brand that creates clothing and accessories made entirely from recycled materials by integrating breakthrough technology. Upcycling the Oceans project pick the trash that is destroying oceans and turns it into top quality yarn to produce fabrics and products. Ecoalf Foundation has managed to involve more than 2500 fishermen in 32 ports, amounting to a total of 440 sea trawlers and collecting more than 300 tons of trash from the bottom of the Mediterranean Sea. Coming from recovering nylon waste, (fabric scraps, fishing nets from the oceans and carpets) recycled nylon requires half the amount of steps compared to the conventional chemical process and reduced energy and water consumption. **Source of information: Web site of Ecoalf. Nov 2019**
More information	https://ecoalf.com/en/

Main priorities are:

- Traceability in production and during use.
- Transparent supply chain management;
- Effective use of resources, focusing on renewable inputs in manufacture and raw materials.
- Chemical and pollution reduction in all levels – from raw materials to manufacturing and life use of and life end of products;
- Design and education – from retailers, producers to consumers;
- Support for innovative technologies;
- Support for sustainable raw materials.
- Improvement and boosting of world-wide recycling system.
- Other challengers:
    - Reduction of plastic microfiber release.
    - Use Best Available Techniques in production.

- Find new sustainable raw materials.

Real case example: Lenzing. Sustainable fiber

Scope	#raw materials #fiber #sustainable
Value added	**Lenzing Group** –Lenzing is an international corporation that produces high-quality fibers from the renewable raw material wood utilizing environmentally friendly and innovative technologies. These fibers form the foundation for a wide range of textile and nonwoven applications, and are also being used in work and protective wear, as well as in various industrial applications. The environmental friendliness and biodegradability of TENCEL™ Lyocell fibers are essential market criteria for sensitive segments such as cosmetics and hygiene. Moreover, TENCEL™ Lyocell fibers have optimum moisture management properties that make them appealing for the use in high-grade home textiles such as bedspreads, sheets and pillow cases, but also in sportswear, and women's outer garments. **Source of information: Web site of Lenzing. Nov 2019**
More information	https://www.lenzing.com/sustainability/

Real case example: Agraloop. Sustainable fibers from food crops

Scope	#raw materials #fiber #sustainable
Value added	**Agraloop** – transforms food crop waste into high-value natural fiber products in a cost competitive and scalable way, providing sustainable and regenerative benefits. The Agraloop™ can utilize a range of feed stocks including oilseed hemp and oilseed flax straw as well as pineapple leaves, banana trunks and sugar cane bark. Through a focus on collaboration as a core strategy, the company is helping to accelerate the global conversion to resource efficiency in textiles/fashion. Circular Systems collaborates with investors and industry stakeholders who are interested in helping to ignite the circular/ regenerative economy. **Source of information: Web site of Agrooloop. Nov 2019**
More information	https://www.circular-systems.com/agraloop

A circular approach to the textile and clothing sector could bring substantial benefits not just for the economy, but for the environment and society as well. Benefits for the economy:

- Material cost savings by using recycled materials (compared to when using virgin materials)
- Extra profit through new services (rent, individualization, warranties, maintenance);
- Better reputation and public image;
- Place for innovations;
- Overall economic growth.

Real case example: Inditex. Join Life products

Scope	#products #brand
Value added	**Join Life collection by ZARA** – Garments with past – created from their own clothes. Work with suppliers to create circular system – to recover cutting waste. Use of Refibra™ Lyocell (Lenzing). Fiber made from recycled cotton and wood sourced from sustainability-grown forests. Recycled polyester – produced with recycled plastic bottles. Recycled wool and cotton. Raw material certified by international standards. Additionally Inditex does the traceability and control all the factories from fiber by external companies auditing environmental and social issues from all the supply chain. **Source of information and image: Web site of ZARA. Nov 2019**
More information	https://www.zara.com/uk/en/join-life-recycled-materials-l1873.html

Benefits for the environment:

- Lowering of greenhouse emissions;
- Reduction of virgin and non-renewable material and energy consumption;
- Reduction of pollution (water, air, land);
- Increased land productivity and overall soil health;
- Reduction of plastic in the ocean;
- Reduction of hazardous chemicals in the environment;
- Reduction of fresh water use.

Real case example: ZDHC- Zero Discharge Hazardous Chemicals

Scope	#Sustainable Supply Chain #Alliances #Hazardous Chemicals

	#Brands
Value added	The ZDHC Roadmap to Zero Programme is a coalition of fashion brands, value chain affiliates and associates. It empowers the global textile, leather, clothing and footwear value chain to substitute hazardous chemicals for safer ones in the production process. ZDHC takes a holistic, open approach, supporting safer chemical management practices across the entire value chain. For that has identified three focus areas which are critical towards eliminating hazardous chemicals: Input (improving chemical inputs), Process (promotes good chemical management) and Output (verifying the chemicals in processes output, e.g. discharged wastewater and sludge). **Source of information and image: Web site of ZDHC. Nov 2019**
More information	https://www.roadmaptozero.com/

Benefits for the society:

- More choice, higher quality;
- Positive health impacts (for workers and consumers as well);
- Respect for overall human rights.

In textile sector exists some raw materials that have long tradition with Circular Economy features as: cotton, wool and other natural fibers which are recycled from pre and postconsumer textile products in order to create new yarns. In some cases, this recycled raw materials does not need dyeing process because the colour is obtained by mixing the already coloured textile wastes.

In the past this kind of business models were important in other to provide the market with raw materials and actually these models are still working but there exists a trend to create textile products with mix of raw materials which get specific characteristics or less prize, but reduce these products recyclability.

Topic 1.2.3.4 Alternative approaches for textile industry – some examples of projects

The **ECWRTI project** [24](started 2015) aims to bring a new technological concept to the market that closes the waterloop by separating the water, organometallics and salty brine and creating a produced clean water that can be fully re-used. Textile mills can reduce their

[24] https://ecwrti.eu/

water consumption by up to 90% using the EColoRO concept, which consists of electrocoagulation followed by membrane filtration, to treat their wastewater and then recycle it. Project's goals are as follows:

- To achieve zero liquid discharge, all water is re-used;
- Reduction of more than 75% freshwater intake;
- Maximum resource and energy efficiency water and wastewater treatment;
- To create cost-effective water treatment solutions;
- Scalable solutions that fit in any industrial setting;

RESYNTEX[25] is a research project which aims to create a new circular economy concept for the textile and chemical industries. Using industrial symbiosis, it aims to produce secondary raw materials from unwearable textile waste. Their goals are as follows:

- Designing a complete value chain from textile waste collection through to the generation of new feedstock for chemicals and textiles;
- Improving collection approaches while increasing public awareness of textile waste and social involvement;
- Enabling traceability of waste using data aggregation;
- Developing innovative business models for the chemical and textile industries;
- Demonstrating a complete reprocessing line for basic textile components, including liquid and solid waste treatment.

1.2.4 Suggested reading

- United Nations homepage – https://www.un.org/en/index.html
- UNESCO homepage – https://en.unesco.org/
- Overview of the United Nations Conference on Sustainable Development (Rio+20) (2012) – https://sustainabledevelopment.un.org/content/documents/1505natprep-liberia-WEB.pdf
- https://www.un.org/sustainabledevelopment/sustainable-development-goals/
- https://www.commonobjective.co/
- https://www.globalfashionagenda.com/initiatives/pulse/#
- https://www.nrdc.org/sites/default/files/rsifullguide.pdf
- https://www.close-the-loop.be/en
- https://scholar.oxy.edu/cgi/viewcontent.cgi?article=1005&context=uep_student

[25] http://www.resyntex.eu/

- European Circular Economy Stakeholder Platform Good Practices - https://circulareconomy.europa.eu/platform/en/good-practices?key_area=All&sector=196&country=All&org_type=All&funding_type=All&identified_challenge=All&scope=All&title=
- http://ethicalfashionforum.com/
- https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-Textiles-Economy_Full-Report.pdf
- https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/full-report.html
- http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI(2019)633143_EN.pdf
- http://www.europarl.europa.eu/EPRS/140841REV1-Workers-conditions-in-the-textile-and-clothing-sector-just-an-Asian-affair-FINAL.pdf

1.2.5 Quiz

Self-evaluation Quiz

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1. What is the % of clothing that is currently being recycled? (select the most suitable option)
    a. ~20%
    b. ~7%
    c. ~1%
2. What is the % of globally produced carbon emissions created each year by the textile and clothing industry? (select the most suitable option)
    a. ~3%
    b. ~5%
    c. ~6%
3. Which economic model could be more efficient to provide sustainable development? (select the most suitable option)
    a. Political Economy
    b. Circular Economy
    c. Linear Economy
4. What are the main principles of circular economy? (select the most suitable option)

a. Excluding waste
b. Keeping resources in use
c. Regenerating natural systems
d. All of the above mentioned

Unit 1.3 Application of Certifications and Policies

1.3.1 Introduction

This unit compiles the most important standards relating to environmental, social, ethical and safety issues in textile and clothing industry oriented to organizations/companies and for textile products. It also gives an insight into industry's trade unions and support organizations.

1.3.2 Short description

Knowledge	**Skills**	**Competencies**
At the end of this unit the in-company trainer will:	*At the end of this unit the in-company trainer will be able to:*	*At the end of this unit, the in-company trainer will have acquired the responsibility and autonomy to:*
• Knows norms, policies, standards relating to environmental, social, ethical, and safety issues.	Ability to develop and implement methodologies, tools and procedures of specific sustainability management issues. • Develop an elementary ability to identify and analyze situations and documents to solve environmental and social problems in a business context.	• Understands the processes of environmental and social changes, applies regulations to prevent environment hazards and social problems. Understands principal causes of unsustainability, manages application of certifications and policies documents. Defines objectives and programs to improve the business sustainability performance.

1.3.3 Content unit

Topic 1.3.3.1 Application of Certifications and Policies

There are around 40 certified standards that regulate such topics as child labour, forced labour, working conditions, organic production, use of chemicals, farmer welfare etc. Such standards provide industry with concrete action models, making it possible for textile and clothing industry to have a positive rather than negative impact on planet's overall ecosystem. However only 2% of world's textile and clothing factories organize their work according to such standards[2627].

Certifications and Guidance Standards oriented to companies

ISO 26000 Guidance on social responsibility[28]. Intended to assist organizations in contributing to sustainable development. It is intended to encourage them to go beyond legal compliance, recognizing that compliance with law is a fundamental duty of any organization and an essential part of their social responsibility. It is intended to promote common understanding in the field of social responsibility and to complement other instruments and initiatives for social responsibility, not to replace them.

BS ISO 20400 Sustainable procurement - Guidance[29]. Provides guidance to organizations, independent of their activity or size, on integrating sustainability within procurement, as described in ISO 26000.

BS 8900-1 Managing sustainable development of organizations - Guide[30]. The guidance in this British Standard is designed to help organizations develop an approach to sustainable development that will continue to evolve and adapt to meet new and continuing challenges and demands.

BS 8900-2 Managing sustainable development of organization - Framework for assessment against BS 8900-1 - Specification[31]. Provide a framework for assessment against the guidance contained in BS 8900-1. It is suitable for any type or size of organization and can be used as a tool to help understand and embed the sustainable development principles set out in BS 8900-1, thus helping an organization to determine and follow its own pathway on sustainable development.

ISO 14001 Environmental management systems[32]. Requirements with guidance for use. Specifies the requirements for an environmental management system that an organization can use to enhance its environmental performance. ISO 14001 is intended for use by an

[26] https://www.apparelentrepreneurship.com/your-guide-to-sustainability/
[27] https://www.globalfashionagenda.com/initiatives/pulse/#
[28] https://www.iso.org/standard/42546.html
[29] http://gpp.golocal-ukraine.com/wp-content/uploads/ISO_20400_2017E-Character_PDF_document.pdf
[30] https://www.lr.org/en-gb/bs-8900/
[31] https://shop.bsigroup.com/ProductDetail/?pid=000000000030271079
[32] https://www.iso.org/standard/60857.html

organization seeking to manage its environmental responsibilities in a systematic manner that contributes to the environmental pillar of sustainability.

ISO 9001 Quality management systems. Requirements[33]. Specifies requirements for a quality management system when an organization needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

ISO 45001 Occupational health and safety[34]. The standard was developed by a committee of occupational health and safety experts, and follows other generic management system approaches such as ISO 14001 and ISO 9001. It takes into account other International Standards in this area such as the International Labour Organization's ILO-OSH Guidelines, various national standards and the ILO's international labour standards and conventions, replacing OSHAS 18001. It provides a framework to increase safety, reduce workplace risks and enhance health and well-being at work, enabling an organization to proactively improve its OH&S performance.

SA8000 Social Accountability 8000[35]. Measures social performance in eight areas important to social accountability in workplaces, anchored by a management system element that drives continuous improvement in all areas of the Standard. The Standard reflects labor provisions contained within the Universal Declaration of Human Rights and International Labour Organization (ILO) conventions. It also respects, complements and supports national labor laws around the world, and currently helps secure ethical working conditions for two million workers.

The EU Eco-Management and Audit Scheme (EMAS)[36] is a premium management instrument developed by the European Commission for companies and other organizations to evaluate, report, and improve their environmental performance. EMAS is open to every type of organization eager to improve its environmental performance. It spans all economic and service sectors and is applicable worldwide.

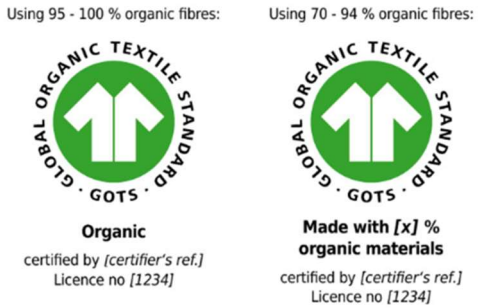
STeP by OEKO-TEX® (sustainable textile production)[37] is a certification system for brands, retail companies and manufacturers from the textile chain who want to communicate their achievements regarding sustainable manufacturing processes to the public in a transparent, credible and clear manner. Certification is possible for production facilities of all processing stages from fibre production, spinning mills, weaving mills, knitting mills to finishing facilities and manufacturers of ready-made textile items.

[33] https://www.iso.org/standard/62085.html
[34] https://www.iso.org/publication/PUB100427.html
[35] http://www.sa-intl.org/index.cfm?fuseaction=Page.ViewPage&PageID=1689
[36] http://ec.europa.eu/environment/emas/index_en.htm
[37] https://www.oeko-tex.com/en/our-standards/step-by-oeko-tex

OEKO-TEX®
CONFIDENCE IN TEXTILES
STeP

Certifications and Initiatives oriented to products

The **Global Organic Textile Standard** (GOTS)[38] worldwide leading textile processing standard for organic fibres, including ecological and social criteria, backed up by independent certification of the entire textile supply chain. The standard covers the processing, manufacturing, packaging, labelling, trading and distribution of all textiles made from at least 70% certified organic natural fibres. The final products may include, but are not limited to fibre products, yarns, fabrics, clothes and home textiles. The standard does not set criteria for leather products.



The **Better Cotton Initiative**[39] exists to make global cotton production better for the people who produce it, better for the environment it grows in and better for the sector's future, by developing Better Cotton as a sustainable mainstream commodity.

The **Organic Content Standard** (OCS)[40] relies on third-party verification to verify a final product contains the accurate amount of a given organically grown material. It does not address the use of chemicals or any social or environmental aspects of production beyond the integrity of the organic material. The OCS uses the chain of custody requirements of the Content Claim Standard (CCS).

[38] https://www.global-standard.org/the-standard.html
[39] https://bettercotton.org/
[40] https://textileexchange.org/wp-content/uploads/2016/06/Organic-Content-Standard_v2.0.pdf

The **Recycled Claim Standard** (RCS)[41] is a chain of custody standard to track recycled raw materials through the supply chain. The standard was developed through work by the Materials Traceability Working Group, part of OIA's Sustainability Working Group. The RCS uses the chain of custody requirements of the Content Claim Standard (CCS).

The **Global Recycled Standard**[42] 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 **Responsible Down Standard**[43] 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 behaviours, and not suffer from pain, fear or distress. The standard also follows the chain of custody from farm to product, so consumers can be confident that the down and feathers in the products they choose are truly RDS.

The goals of the **Responsible Wool Standard**[44] are to provide the industry with a tool to recognize the best practices of farmers; ensuring that wool comes from farms with a progressive approach to managing their land, and from sheep that have been treated responsibly.

[41] https://textileexchange.org/wp-content/uploads/2017/06/Recycled-Claim-Standard-v2.0.pdf
[42] https://textileexchange.org/wp-content/uploads/2017/06/Global-Recycled-Standard-v4.0.pdf
[43] http://responsibledown.org/
[44] http://responsiblewool.org/

MADE IN GREEN by OEKO-TEX®[45] is an independent textile label for highlighting consumer products and semi-finished products at all levels of the textile chain that are made from materials tested for harmful substances and that have been manufactured by using environmentally friendly processes and under safe and socially responsible working conditions.

Ecolabel[46] is a label of environmental excellence that is awarded to products and services meeting high environmental standards throughout their life-cycle: from raw material extraction, to production, distribution and disposal. The EU Ecolabel promotes the circular economy by encouraging producers to generate less waste and CO2 during the manufacturing process. The EU Ecolabel criteria also encourages companies to develop products that are durable, easy to repair and recycle. The EU Ecolabel criteria provide exigent guidelines for companies looking to lower their environmental impact and guarantee the efficiency of their environmental actions through third party controls.

The international **Fairtrade** system[47] - made up of Fairtrade International and its member organizations - represents the world's largest and most recognized fair trade system. The Fairtrade Standards are designed to address the imbalance of power in trading relationships, unstable markets and the injustices of conventional trade.

[45] https://www.oeko-tex.com/en/our-standards/made-in-green-by-oeko-tex
[46] http://ec.europa.eu/environment/ecolabel/index_en.htm
[47] https://www.fairtrade.net/

Cradle to Cradle Certified™ Products Program[48] guides designers and manufacturers through a continual improvement process that looks at a product through five quality categories — material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. A product receives an achievement level in each category — Basic, Bronze, Silver, Gold, or Platinum — with the lowest achievement level representing the product's overall mark. Product assessments are performed by a qualified independent organization trained by the Institute. Assessment Summary Reports are reviewed by the Institute, which certifies products meeting the Standard requirements, and licenses the use of the Cradle to Cradle Certified™ word and design marks to the product manufacturer. Every two years, manufacturers must demonstrate good faith efforts to improve their products in order to have their products recertified.

Real case example: C&A product certified Cradle to Cradle

Scope	#Certified Cradle to Cladle #Brand
Value added	C2C Certified™ products are designed as nature intended, with products considered as biological nutrients - designed to be reused or recycled into new products and produced with care for the environment without creating unnecessary waste, C&A has Gold Level Certified™ T-Shirts can be even safely composted. **Source of information: Web site of C&A. Nov 2019**
More information	https://www.c-and-a.com/uk/en/corporate/company/sustainability/c2c/ https://www.c-and-a.com/eu/en/shop/wearthechange-more-sustainable-fashion-cradle-to-cradle

Topic 1.3.3.2 Trade unions

Working on both national and international levels, trade unions have a positive impact on the industry, making it possible to make changes. The global union federation IndustriALL[49] founded in 2012 represents 50 million workers in 140 countries, covering different mining, energy and manufacturing sectors, including textile, garment, leather and footwear. Union

[48] https://www.c2ccertified.org/
[49] http://www.industriall-union.org/who-we-are

is fighting for better working conditions, human rights and trade union rights around the world.

Topic 1.3.3.3 Other organizations and initiatives – some examples

In order to make the textile and clothing industry more sustainable and minimize its impact on the environment, there are many organizations, initiatives, NGOs, research institutions. Their most important task is to ensure the flow of information, to educate manufacturers, retailers and consumers, as well as to develop practical tools like calculating emissions, the impact of a garment, calculating living wages and implementing safety programs.

EURATEX (The European Apparel and Textile Organisation)[50] is a European organisation based in Brussels, Belgium. It represents the European textile and clothing industry, and its main objective is to create an environment within the European Union which is conducive to the manufacture of textile and clothing products. It promotes the interests of its members while taking into account the European Union's institutional framework and its international obligations.

The **Ethical Trading Initiative** (ETI)[51] is a leading alliance of companies, trade unions and NGOs that promotes respect for workers' rights around the globe. Ethical trade means that retailers, brands and their suppliers take responsibility for improving the working conditions of the people who make the products they sell. Most of these workers are employed by supplier companies around the world, many of them based in poor countries where laws designed to protect workers' rights are inadequate or not enforced. Companies with a commitment to ethical trade adopt a code of labour practice that they expect all their suppliers to work towards. Such codes address issues like wages, hours of work, health and safety and the right to join free trade unions.

The **Sustainable Apparel Coalition**[52] is the apparel, footwear, and textile industry's leading alliance for sustainable production. The Coalition develops the Higg Index, a standardized value chain measurement suite of tools for all industry participants. These tools measure environmental and social labor impacts across the value chain. With this data, the industry can address inefficiencies, improve sustainability performance, and achieve the environmental and social transparency consumers are demanding.

Real case example: Sustainable Apparel Coalition. SAC

Scope	#Sustainable Supply Chain #CSR
Value added	It is a multi-stakeholder engagement, formed in 2011, by a group of global apparel and footwear companies and non-profit organizations representing nearly one third of the global market share for apparel

[50] https://euratex.eu/
[51] https://www.ethicaltrade.org/
[52] https://apparelcoalition.org/higg-msi/

	and footwear. The SAC seeks to build a common approach for measuring and evaluating apparel and footwear product sustainability performance It aims to develop common measurements, and a common environmental understanding of products' impacts across the industry by building on the Outdoor Industry Association (OIA)'s Eco Index™. The Eco Index™ is a standardized tool for measuring the environmental impacts of outdoor products such as boots, clothing and tents and evaluates the impacts in six key areas of a product's life cycle: materials, packaging, product manufacturing and assembly, transport and distribution, use of service, and end of life. Measuring performance of apparel and footwear products will spotlight priorities for action, and opportunities for technological innovation (Sustainable Apparel Coalition, 2012). **Source of information: Web site of Sustainable Apparel Coalition. Nov 2019**
More information	https://apparelcoalition.org/

The **Sustainable Clothing Action Plan** (SCAP)[53] brings together clothing retailers, brands, suppliers, local authority representatives, recyclers, charities, trade bodies and the public sector to reduce the environmental footprint of clothing[54].

Make Fashion Circular[55] brings together key industry stakeholders to build a circular economy for textiles, starting with clothing. Participants will work together to define a vision for a new global textiles system, which addresses the significant drawbacks of the current system of fast fashion. The new system for textiles is based on the principles of a circular economy, generating growth that benefits citizens and businesses, while phasing out negative impacts such as waste and pollution.

Reverse Resources[56] provides software to manufacturers and their buyers to work together on making profitable use of factory offcuts. The software measures the quantity of production offcuts, maps them by type, and allows the manufacturer to share relevant data with buyers.

There are several other initiatives that are focused on consumers to change their perception of fashion and their shopping and caring for products habits, in order to make society more engaged and aware of Climate change, for example Clean Clothes Campaign[57], Fashion Revolution[58], Good on You[59], Climate Revolution[60] and others. Consumers can be the ones

[53] http://www.wrap.org.uk/sustainable-textiles/scap
[54] http://www.wrap.org.uk/sites/files/wrap/WRAP-Plan-Resource-Revolution-Creating-the-Future.pdf
[55] https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular
[56] https://reverseresources.net/
[57] https://cleanclothes.org/
[58] https://www.fashionrevolution.org/

to pressure brands to improve working conditions, minimize the negative impact on the environment, raise the quality of their production and use the resources more rationally, therefore education is one of the key factor for making changes.

1.3.4 Suggested readings

- https://www.apparelentrepreneurship.com/your-guide-to-sustainability/
- www.textileexchange.org/wp-content/uploads/2017/02/ Cert-Toolkit-Basic-Package.pdf

1.3.5 Quiz

Self-evaluation Quiz

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1. How many textile and clothing factories organize their work according to structured standards? (select the most suitable option)
    a. ~ 10%
    b. ~ 5%
    c. ~ 2%
2. Is the application of the certification obligatory? (select the most suitable option)
    a. No, it is a choice of good practice
    b. Yes, it is obligatory
3. Is Ecolabel oriented to products or organizations? (select the most suitable option)
    a. Products
    b. Organizations
    c. Both products and organizations
4. To witch stage of textile and clothing production the sustainability management applies? (select the most suitable option)
    a. Design
    b. Retail
    c. Manufacturing

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[59] https://goodonyou.eco/
[60] http://climaterevolution.co.uk/wp/

d. Consumption
e. To all above mentioned

Unit 1.4 Sustainability Assessment

1.4.1 Introduction

This unit focuses on various methods for the assessment of sustainability, analyses the four domains of sustainability, as well as gives an insight into the circularity in the textile and clothing industry supply chain.

1.4.2 Short description

Knowledge	Skills	Competencies
At the end of this unit the in-company trainer will:	*At the end of this unit the in-company trainer will be able to:*	*At the end of this unit, the in-company trainer will have acquired the responsibility and autonomy to:*
• Knows the four domain model of sustainability: Economics, Ecology, Politics and Culture.	• Selects the most appropriate methods to teach the work-team about sustainability and its management in all four models (components) of sustainable business strategy.	• Understands and applies circles of sustainability: four domains model: economic domain associated with the production, use, and management of resources; ecological domain that occurs across the intersection between the social and the natural realms; political domain associated with basic issues of social power; cultural domain which, over time, expresses continuities and discontinuities of social meaning.

1.4.3 Content unit

Topic 1.4.3.1 Circles of sustainability: A four domains model

Circles of Sustainability is a method for understanding and assessing sustainability, and for managing projects directed towards socially sustainable outcomes. Although this method is mostly used for cities, a similar approach could be used to evaluate the level of sustainability in different areas of the textile and clothing industry/company, by defining all four domains – economic (evaluating production, consumption and retail processes, overall management of resources), political (evaluating business ethics, overall politic strategy and social cooperation, national and global politics in the field), ecological (evaluating impact on the environment, overall ecologic sustainability of the company), cultural (evaluating consumer, level of educational and cultural contribution).

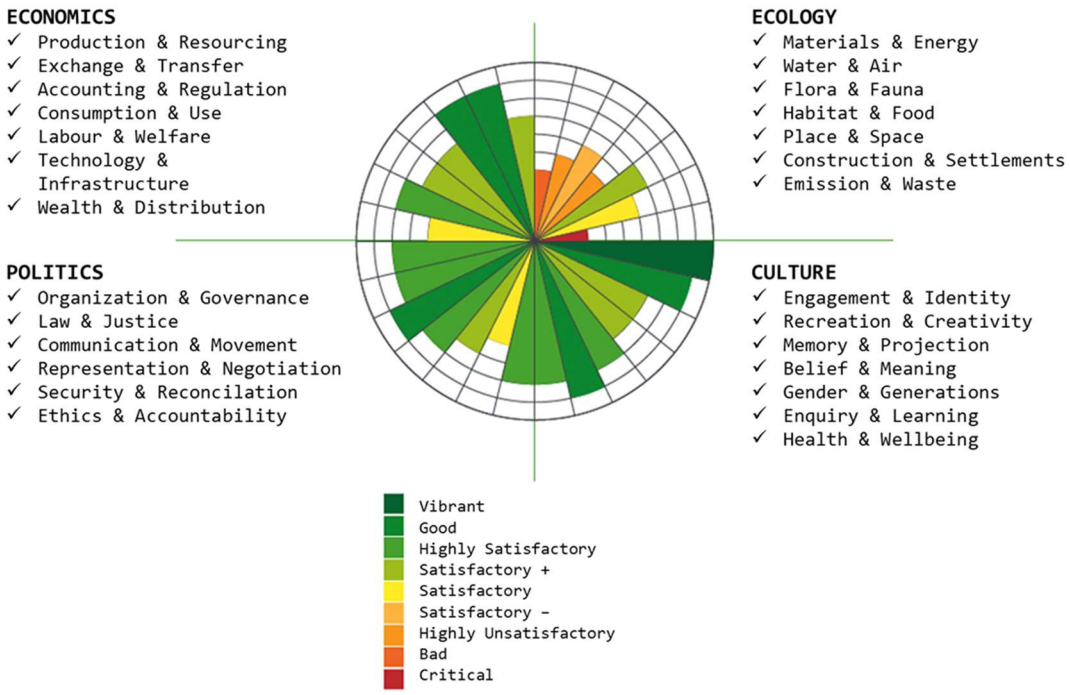

Figure 5. Domains of sustainability

Topic 1.4.3.2 Application in the textile and clothing industry

The Pulse of the Fashion Industry report[61], promoted by Global Fashion Agenda in collaboration with The Boston Consulting Group (2018), is an assessment of the industry's environmental and social performance. The "Pulse Score" is measured according to the performance of the participants of the industry (max 100). In 2017 it is reported that the Pulse Score was 32, but in 2018 it has increased to 38, showing progress and the increase of

[61] https://www.globalfashionagenda.com/initiatives/pulse/#

awareness, yet there is still a lot more to change and improve in order for the textile and clothing industry to become sustainable and environmentally and socially responsible.

To put fashion on a path to long-term prosperity financially, socially and environmentally, the 2018 Pulse report stresses the urgency of collective effort to go beyond what is available and possible today. To achieve lasting impact at scale, the industry needs systemic change through leadership, innovation and collaboration, fashion companies must join forces with suppliers, investors, regulators, NGOs, academia and consumers to create an ecosystem that supports transformational innovation and disruptive business models.

The 2018 report aims to give guidance to companies looking to start or find further advances toward more responsible ways of doing business. For the first time, the report includes a Pulse Curve enabling companies to measure their performance against other industry players and a Roadmap to Scale, an inspiring guide for the industry – built on proven best practices with industry players – offering concrete actions for businesses.

TOPIC 1.4.3.3. Circularity in the Supply Chain

The length of the supply chain in the textile and clothing industry is quite long and complicated. Different processing steps of garment production are conducted by different suppliers, which makes it difficult to maintain the traceability and transparency of the process. Although principles of sustainability need to be practiced throughout all of the supply chain stages, the biggest environmental impact is usually made at the early stages of the supply chain (resources and textile production), therefore it is necessary to place an additional focus on these stages to improve the environmental performance of the industry.

Figure 6. Clothing Supply Chain of Circular Economy

Resources:

- Positivize the use of natural, biodegradable fibres

- Positivize the use of recycled fibres
- Using nature friendly raw materials as natural dyes, and low energy process.

Design:

- Design thinking in giving more than one life to the product (reparability, recyclability, retransform, etc.).
- Long-lasting design,
- Zero-waste design, considering environmental impacts
- Add to design process tools for innotate with new technology and circular products

Production:

- Traceability of all the production steps.
- Consideration of environmental and social impacts in all production stages (fiber, spinning, weaving, fabric dyeing and finishing, textile manufacturer and garment finishing).
- Use the Best Available Techniques.
- Innovations, new technology focus on circular processes
- Production based on Circular economy principles for water, energy, waste and raw materials.
- High quality, long-lasting production
- Give sustainable attributes to the products.

Retail:

- Service-orientated business
- Online services oriented to reduce environmental and social impacts
- Innovations, new technologies to reduce environmental and social impacts and get more information from supply chain
- Clear information towards consumer education and not greenwashing focus

Consumption

- Wardrobe planning
- Responsible care for products
- Re-making, repair of clothing, second hand buying
- Donating; collecting old clothing and giving it to recycling points
- Textile Sustainable Attributes.

Re-Use, Recycle:

- Redesign and Upcycling, Remanufacturing
- Recycling (fibres, materials, garments)

- Collecting the waste, creating and promoting new take back systems
- Encouraging exchange and lease of clothing

1.4.4 Suggested reading

- https://www.globalfashionagenda.com/pulse-of-the-fashion-industry-2018-report-released/#
- https://city.milwaukee.gov/ReFreshMKE_PlanFinal_Web.pdf
- https://www.researchgate.net/publication/319115318_Sustainable_Supply_Chain_Management_Implementation-Enablers_and_Barriers_in_the_Textile_Industry
- https://www.researchgate.net/publication/319597844_Sustainability_Issues_in_Textile_and_Apparel_Supply_Chains
- https://www.sciencedirect.com/topics/engineering/textile-supply-chain
- http://www.circlesofsustainability.org/wp-content/uploads/2014/10/Ch-07-Circles-Urban-Profile-2015.pdf
- https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/1952.pdf

1.4.5 Quiz

Self-evaluation Quiz

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1. What are the four domains of the circles of sustainability? (select the most suitable option)
    a. Ergonomics, Economy, Biology, Culture
    b. Economics, Politics, Ecology, Culture
    c. Politics, Ecology, Marketing, Logistics
2. According to The Pulse of the Fashion Industry how “The Pulse Score” is measured? (select the most suitable option)
    a. According to the environmental and social performance of the participants of the industry
    b. According to the economic performance of the participants of the industry
    c. According to the political performance of the participants of the industry

3. What is the tendency of "The Pulse Score"? (select the most suitable option)
    a. Decreasing
    b. Growing
    c. At a constant level
4. At what stages of the textile and clothing industry supply chain the biggest environmental impact is made? (select the most suitable option)
    a. Design
    b. Consumption
    c. Resources and textile production

Unit 1.5 Internal Sustainability

1.5.1 Introduction

This unit gives an insight on main steps towards internal sustainability and provides a wide range of real case examples from the textile and clothing industry.

1.5.2 Short description

Knowledge	Skills	Competencies
At the end of this unit the in-company trainer will:	*At the end of this unit the in-company trainer will be able to:*	*At the end of this unit, the in-company trainer will have acquired the responsibility and autonomy to:*
• Describes internal and corporate sustainability: employee conditions, technology and equipment sustainability, quality and procurement sustainability.	• Selects the most suitable methods to analyze solutions needed to ensure that business is carried out in a way that is environmentally, socially and economically responsible.	• Implements the supervision of: safety with the highest priority, constantly striving to eliminate the causes of incidents in our quest for an injury-free workplace; responsible and proactive attitude and is committed to minimizing the harmful effects of operations; includes minimizing disruption; fostering local involvement and enterprise through the use of local

		labor, equipment and materials; engaging effectively with the local community

1.5.3 Content unit

Topic 1.5.3.1 Internal sustainability

After having studied the theoretical materials and suggested reading in the previous units, in order to be able to use a sustainable approach to the textile and clothing sector business, we will discuss a few examples below. Main steps towards internal sustainability:

- To identify risk factors and draw up a preventive action plan for all supply chain stages;
- To design products and processes considering the sustainable principles (in terms of economy, society and environment)
- To ensure adequate and safe working conditions;
- To make sure that the production process is planned and carried out in an environmentally, socially and economically responsible way, eliminating negative impact in all three dimensions (people, planet and profit);
- To ensure effective use of resources and to move to renewable inputs (materials and energy consumption);
- To implement circular systems;
- To educate employees of all levels about the necessity for sustainable development;
- To include sustainability aspects in marketing strategy, increasing the awareness of the consumer;
- To cooperate with other industries, research organizations, government and other organizations at national and global level;
- To encourage investment in innovative solutions that improve the company's performance and compliance with sustainability requirements.

Topic 1.5.3.2 Real cases of sustainable approaches in the textile and clothing industry

SCOOP (Portugal) is an export company, concentrating on the clothing industry, which has the sustainability as a top priority and as personal passion to the company CEO. SCOOP has the developed GAYA collection[62], a sustainable collection based on stocks from the textile

[62] https://www.scoop.pt/en/news/scoop-takes-the-gaya-collection-to-texworld-in-the-united-stated-of-america/

industry. The construction of the Gaya garments is made with stocks, for instance prototypes or collection remains, which are redesigned in a new garment.

TINTEX (Portugal)[63] began its journey, making high quality, natural based, responsible jersey fabrics combined with their core expertise using the latest and best sustainable hi-tech dyeing and finishing processes reinforcing the company's advanced vision to better supply the contemporary fashion, sport and lingerie markets. The TINTEX vision is to build a new generation textile business that truly delivers an eco-sustainable strategy for all its production and fabric innovations through dedicated investments in technology, assets and skilled teams of specialist staff. One of the R&D project that TINTEX participate is Picasso Project, for the development of a natural dyeing processes, through the use of plants and mushrooms.

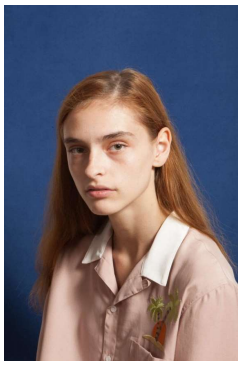
Patzaikin (Romania)[64] - Romanian fashion and lifestyle House set as an ecosystem founded in 2011 in Bucharest, by architect Teodor Frolu and his partner, olympian Ivan Patzaichin. Conceptualized as a collaborative entrepreneurship between artists, architects, designers and passionate craft people, the Patzaikin Ecosystem promotes the transfer of material and immaterial resources from the local rural heritage, guided by its creative experience and distilled through contemporary design.

[63] https://store.tintextextiles.com/en/blog/20years/
[64] https://patzaikin.com/

Gnana Studio (Romania)[65] - established in 2011 by former model Floriana Sandu, ethical and sustainable fashion label. Products are made with eco-friendly and recycled materials and locally woven textiles. Cotton and bamboo used in the collections come from antique shops or specialised warehouses and brought back to life via a transparent production process.

Mohxa (Greece)[66] founded by Jason Pachos and George Papachatzopoulos, the brand has translated the seductive energy of the beach – and the myriad of cultural references that come with it – into shirts, t-shirts and accessories. Working with local manufactures from the start, the first Mohxa collection was built around vintage fabrics or 'dead stock' left over from the Greek textile industry. Having built a positive emblem of Greek style out of the economic strife, today Mohxa is a bastion for championing good vibes and better fashion.

[65] https://gnanastudio.com/about/
[66] https://mohxa.com/collections/new-line



Ioanna Kourbela (Greece)[67] started as a handmade knitwear brand. When in 2003 Ioanna Kourbela took the creative helm and produced her eponymous label, the heritage of Greek craftsmanship ensured she quickly developed a distinct aesthetic. Staying true to her roots, the brand today continues to produce avant-garde and covetable knitwear inspired by the captivating Greek light and geometry. A label committed to sustainability, all the designs are created from locally sourced fabrics, adding an extra layer of desirability to this celebrated brand. Using of natural raw materials, innovation, production exclusively made in Greece, high quality fabrics and stitching, respect for man and the environment are the concepts that have determined and continue to determine the course of company.



Aspect Limited (Latvia)[68] is a premier manufacturer of custom Sportswear and team uniforms, trying to become more environmentally friendly by using eco-friendly printing and recycles polyester fabrics. Aspect focus as a sports clothing manufacturer is to ensure the perfect quality of products and to foster a friendly and safe working environment. They are continuously adding technical innovations, new solutions and high-tech fabrics to sportswear production process. They are increasing their use of environmentally friendly processes and products and has a strong social responsibility charter.

[67] https://ioannakourbela.com/about/?v=a7bdee32cb21
[68] https://www.aspectcustomwear.com/home

ZĪLE (Latvia)[69] - Latvian fashion brand striving for a more sustainable future through the concept of upcycling. The label's main resource materials are denim trousers, men's shirts. At the core of the brand is the idea that what people wear is a symbol of their character, identity and values, and that the global environmental trend is an important part of current values. That is why ZĪLE reimagines and reworks classical garments to create a sustainable and modern wardrobe.

CRAiLAR Technologies (Canada) – a cleantech company focused on providing textile, composite and pulping solutions, through the processing of industrial hemp, and other bast fibers[70]. Bast fibres do not contribute to micro-plastic contamination and are compostable at the end of their useful life.

[69] https://www.facebook.com/pg/ziledesign/about/?ref=page_internal
[70] https://bastfibretech.com/

SAITEX (Vietnam)[71] – a game-changing denim factory. The factory's unique closed system recycles 98% of all water used. Through its commitment to renewable energy resources like solar power, Saitex has reduced its energy usage by 5.3 million kilowatt hours of power per year—and reduced CO2 emissions by nearly 80%. Unlike traditional driers, Saitex air dries their jeans, using air recycled from hot factory machinery. After mostly drying on the conveyor, each pair is briefly finished in a commercial machine. All denim creates a toxic by-product called sludge, but at Saitex, the sludge is extracted and shipped to a nearby brick factory. Mixed with concrete, the toxic material can no longer leech into the environment. The resulting bricks are used to build affordable homes.

Lindex sustainability policy – four areas in the context of sustainability: circular economy, gender equality, climate change and reduction of pollution[72]. In 2017 Lindex signed the 2020 Circular Fashion System Commitment by Global Fashion Agenda. The company strives to use more sustainable materials (organic cotton, viscose, Tencel©, re-used and recycled fabrics). Production process: Lindex definition of a more sustainable process is one that shows a significant and measurable improvement in comparison with the conventional method with

[71] https://www.sai-tex.com/enviroment/
[72] https://about.lindex.com/se/wp-content/uploads/sites/3/2016/04/lindex-sustainability-report-2017.pdf

regard to water, energy, chemicals and waste, as well as health and safety for workers. Example: Better Denim – first styles launched in 2016. Today washing process uses 85% less water, 70% less energy and 45% less (and better) chemicals than conventional methods. All cotton comes from Better Cotton, organic or recycled cotton.

Reformation[73] – a woman's clothing brand that uses sustainable development strategy as their business model, by creating green building infrastructure, using renewable energy sources like wind energy, energy efficient technologies, natural or recycled materials and non-toxic treatment methods. The company invests in programs that replace the resources they've spent for example the Brazilian Rosewood Amazon Conservation Project and the Bonneville Environmental Foundation (BEF) Water Restoration Program. Organic wastes from production process are recycled or composted, textile wastes are recycled or donated (75% of waste is recycled). Majority of the production is sold online, recycled paper hangers are used instead of plastic or metallic ones, packaging is plastic-free and made from 100% recycled paper products and compostable bio-based films.

EVRNU Regenerative Fiber Technology[74] – textile technology company that specializes in the breakdown of garment waste, converting it into a new, high quality raw material with which to create new textiles. While mechanical garment recycling has existed for a very long time, Evrnu is breaking waste down to the molecular level and realigning it into premium new fiber. The technology is as follows: garment waste is collected, sorted, and separated. Waste is then purified, shredded, and turned into a pulp. Extruded cellulose creates a fiber

[73] https://www.thereformation.com/pages/our-stuff
[74] https://www.evrnu.com/

finer than silk and stronger than cotton. Fiber is spun into yarn, dyed and woven into fabric to be used to create recyclable textiles. Textiles made with Evrnu fiber are designed to be fully recyclable. Evrnu has developed prototype jeans and T-shirts using post-use recycled cotton, working with partners such as Levi's and Target.



QMILK – fibers[75] are 100% natural, soft and smooth as silk and skin friendly, light-weight and 100% compostable, meeting the requirement of innovative material developments. With a natural antibacterial effect and high hydrophilicity, they provide added value of the fiber products in the growth market. QMILK is the only natural fiber that has thermo-bonding properties, other natural fibers can also be combined without conventional plastics or phenolic resins.

Nike's 'Rewire' approach is a supply-chain strategy based on "integration, incentives, and innovation". One of the aims of the programme is to incentivise suppliers to become more efficient and innovative. To measure sustainability, Nike created a Sustainable Manufacturing and Sourcing Index, assessing environmental, health, safety, and labour practices, and performance, on a scale of red, yellow, bronze, silver, and gold. By 2015, 86% of suppliers were rated bronze or better. High-performing suppliers get access to training in key areas to further improve their performance, including waste management, energy and water efficiency, and implementation of lean practices[76].

[75] https://www.qmilkfiber.eu/?lang=en
[76] https://sgbonline.com/eric-sprunk-discusses-nikes-sustainability-journey/

1.5.4 Suggested reading

- European Circular Economy Stakeholder Platform Good Practices - https://circulareconomy.europa.eu/platform/en/good-practices?key_area=All&sector=196&country=All&org_type=All&funding_type=All&identified_challenge=All&scope=All&title=

1.5.5 Quiz

Self-evaluation Quiz

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1. How important is the education of employees about sustainability? (select the most suitable option)
    a. Not important at all, if system works it works
    b. Not very important, since it is not mandatory
    c. Very important, each step should be maintained in a sustainable manner
2. What would be the first step towards a more sustainable business model? (select the most suitable option)
    a. Identification of risk factors and drawing up a preventive action plan for all supply chain stages
    b. Marketing strategy
    c. Investment in new technologies
3. Implementation of circular systems is one of the steps towards sustainable development (select the right answer)
    a. True
    b. False
4. Does the Nike's Rewire approach incentivise suppliers to become more efficient and innovative? (select the right answer)
    a. Yes
    b. No
5. Which factory could be considered as the most sustainable in terms of water recycling and minimization of water pollution? (select the most suitable option)
    a. CRAiLAR
    b. SAITEX
    c. Aspect Limited