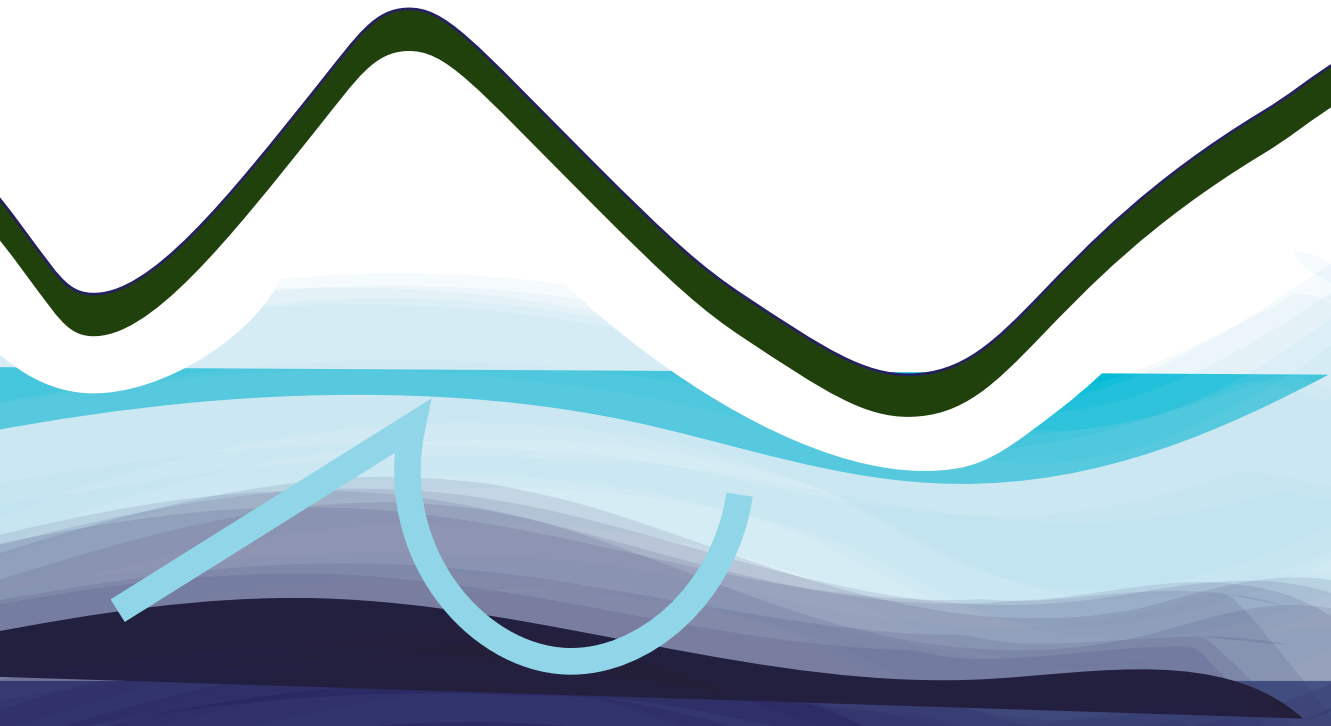
Laura Seppälä

Responsibility and sustainability in the outdoor clothing industry

based on the website communication of the brands in 2009 and 2021



Acta electronica Universitatis Lapponiensis 349

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LAURA SEPPÄLÄ

RESPONSIBILITY AND SUSTAINABILITY IN THE OUTDOOR CLOTHING INDUSTRY

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Academic dissertation to be publicly defended with the permission
of the Faculty of Art and Design at the University of Lapland
in lecture hall 3 (LS3) on 24 November at 12 noon.

LAPIN YLIOPISTO
UNIVERSITY OF LAPLAND

Rovaniemi 2022

University of Lapland
Faculty of Art and Design

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Kansi: Laura Seppälä
Taitto: Taittotalo PrintOne

Acta electronica Universitatis Lapponiensis 349

ISBN 978-952-337-336-5
ISSN 1796-6310

Elektronisen väitöskirjan pysyvä osoite: http://urn.fi/URN:ISBN:978-952-337-336-5

"It's surely our responsibility to do everything within our power to create a planet that provides a home not just for us, but for all life on Earth."

-Sir David Attenborough-

Abstract

This research study is a longitudinal qualitative case study on the responsibility and sustainability in the outdoor clothing industry. The study compared the data I collected from the websites of 12 selected outdoor clothing companies between 2009 and 2021. The first part of this study was performed between 2007 and 2009. I studied the responsible actions of the outdoor brands on their websites and then used online content analysis to interpret the data. The data were analyzed both deductively and inductively. I also used the Sustainable Apparel Coalition's Higg Index tool for coding themes, as well as picking themes inductively from the data.

A broad body of existing research has addressed specific sustainability issues, but I was unable to find a study providing a holistic view of responsibility in the outdoor industry. I concentrated my theoretical background on two aspects of responsibility, environmental and social responsibility. The major topics were the phases of the supply chain, including materials, animal welfare, and principles of workers' rights. Most of the existing research in the clothing field has concentrated on fast fashion, not specifically on outdoor clothing. However, the technical nature of outdoor clothing requires different standards for the supply chain. Additionally, the outdoor clothing industry is related to nature and therefore expected to be sustainable. This study investigated the 12 companies' public communication about responsibility on their websites in 2009 and 2021. This information does not necessarily correlate with what the companies have done in real life or whether they took further action beyond their public communications. Rather, the objective of this study was to understand how communicated responsibility actions were improved in 12 years. The main research question was as follows:

How has selected outdoor clothing companies' websites' communication changed regarding sustainability and responsibility between 2009 and 2021?

As a final remark on the study's first phase, I suggested that outdoor brands could not survive in the business without acknowledging environmental responsibility as consumers' environmental awareness was increasing, even in 2009. I concluded that *"the outdoor industry has awakened to take responsibility and started to work for sustainable development."*

Further, this study aimed to determine what progress has happened over the past decade, and it concluded that many factors stated in 2009 are still accurate. The study found that the environmental challenges have become more complex, and new topics have emerged. Some of the emerging topics of the past decade are climate change, PFCs, microplastics, and animal welfare. Furthermore, social responsibility issues,

such as forced labor, a living wage, and health and safety, have garnered attention. Responsible supply chain management often requires collaboration between brands, industry associations, non-profits, standards, and non-governmental organizations. Thus, the brands' involvement in responsibility organizations and third-party auditioning has increased. I conclude that the past decade has rendered responsibility and sustainability inseparable parts of the outdoor clothing business.

Keywords: responsibility, sustainability, environmental responsibility, social responsibility, the outdoor clothing industry, responsible supply chain management

Tiivistelmä

Tämä pitkittäistutkimus on laadullinen tapaustutkimus ulkoiluvaatealan vastuullisuudesta ja kestävästä kehityksestä. Tutkimuksessa verrataan kahdentoista ulkoiluvaateyrityksen verkkosivustoilla vuosina 2009 ja 2021 keräämääni aineistoa. Tutkimuksen ensimmäinen osa tehtiin vuosina 2007-2009. Tutkin ulkoiluvaatemerkkien vastuullisten toimien viestintää niiden verkkosivustoilla. Sen jälkeen käytin verkkosisällön analyysia aineiston tulkintaan. Aineistoa analysoitiin sekä deduktiivisesti että induktiivisesti. Käytin Sustainable Apparel Coalitionin Higg Index -työkalua teemojen koodaamiseen ja poimin teemoja myös induktiivisesti aineistosta.

Kestävää kehitystä ja vastuullisuutta on tutkittu laajasti, mutta en löytänyt tutkimusta vastuullisuuden kokonaisvaltaisesta tarkastelusta ulkoiluvaatealalla. Keskityin teoreettisessa taustatyössäni vastuullisuuden kahteen näkökulmaan, ympäristö- ja sosiaaliseen vastuullisuuteen. Tärkeimmät aiheet olivat kaikki toimitusketjun vaiheet, mukaan lukien materiaalit, eläinten hyvinvointi ja työntekijöiden oikeuksien periaatteet. Suurin osa vaatetusalan nykyisestä tutkimuksesta keskittyy pikamuotiin, ei erityisesti ulkoiluvaatteisiin. Ulkoiluvaatteiden tekninen luonne asettaa kuitenkin erilaisia vaatimuksia toimitusketjulle. Lisäksi ulkoiluvaateala on yhteydessä luontoon, ja siksi sen odotetaan olevan vastuullinen ja ympäristöystävällinen. Tässä tutkimuksessa tutkittiin näiden 12 yrityksen julkista viestintää vastuullisuudesta niiden verkkosivustoilla vuosina 2009 ja 2021. Näin ollen niiden verkkosivustoilla olevat tiedot eivät välttämättä vastaa sitä, mitä ne ovat tehneet tosielämässä. Toisaalta yritykset ovat voineet tehdä jotain muuta, mitä ne eivät vielä mainitse julkisesti. Tämän tutkimuksen tavoitteena oli ymmärtää, miten viestittyjä vastuullisuustoimia parannettiin kahdentoista vuoden aikana. Päätutkimuskysymyksenä oli:

Miten valittujen ulkoiluvaateyritysten verkkosivujen viestintä on muuttunut kestävän kehityksen ja vastuullisuuden osalta vuosien 2009 ja 2021 välillä?

Tutkimuksen ensimmäisen vaiheen johtopäätöksenä esitin: Ulkoilualan yritykset eivät voisi selviytyä liiketoiminnassa ilman ympäristövastuun tiedostamista, koska kuluttajien ympäristötietoisuus alkoi lisääntyä jo vuonna 2009. Totesin vuonna 2009, että *”ulkoiluala on herännyt ottamaan vastuuta ja alkanut työskentelemään kestävän kehityksen puolesta”.*

Tutkimuksessa pyrittiin selvittämään, mitä oli tapahtunut viime vuosikymmenen aikana. Monet jo vuonna 2009 todetut vastuullisuustoimet ovat edelleen ajankohtaisia. Tämän tutkimuksen tuloksena oli, että ympäristöhaasteet olivat muuttuneet entistä monimutkaisemmiksi, ja uusia on tullut esiin. Viime vuosikymmenen nousevia aiheita olivat muun muassa ilmastonmuutos, PFC-yhdisteet, mikromuovit ja eläin-

ten hyvinvointi. Viime vuosikymmenen aikana ovat nousseet esiin ja saaneet enemmän huomiota sosiaalisen vastuun kysymykset, kuten pakkotyö, elämiseen riittävä palkka sekä terveys ja turvallisuus. Vastuullinen toimitusketjun hallinta edellyttää usein yhteistyötä tuotemerkkien, toimialajärjestöjen, voittoa tavoittelemattomien järjestöjen, standardointiorganisaatioiden ja kansalaisjärjestöjen välillä. Brändien osallistuminen vastuullisuusjärjestöihin ja kolmannen osapuolen auditointeihin on lisääntynyt. Lopuksi totean, että viime vuosikymmenen aikana vastuullisuudesta ja kestävästä kehityksestä on tullut erottamaton osa ulkoiluvaatetusalaa.

Asiasanat: vastuullisuus, kestävyys, ympäristövastuu, sosiaalinen vastuu, ulkoiluvaateala, vastuullinen toimitusketjun hallinta.

Acknowledgements

I have been passionate about outdoor clothing and sustainability for over a decade. So when I started my initial research, I desired to understand sustainability better in the outdoor clothing field. After a decade, I have gained a holistic picture of the topic, and I have been privileged to work in the field of my interests.

First of all, I want to thank my supervisors, professor Ana Nuutinen and professor emerita Kaarina Määttä. Thank you, Ana, for your valuable comments and encouragement. I sincerely thank Kaarina Määttä for believing me to do this in this time frame. Thank you, Kaarina, for your patient answers, valuable knowledge, and continuous support. My graditude goes also to professor emerita Marjatta Heikkilä-Rastas for supervising the initial part of the research.

I owe my gratitude to the pre-examiners of this work. Thank you, associate professor Nithikul Nimkulrat and professor Annamari Vänskä for very insightful comments. I also want to thank Annamari Vänskä for being my opponent in the public defense.

For funding I want to thank following: University of Lapland, Esko Riepula Grant.

Thank you Dr. Katy Stevens from European Outdoor Group for insightful knowledge. I also want to thank my dear friends for supporting me over the years. Especially Esa Korhonen and Johanna Metsäpuu have seen many phases of my research path.

As a common phrase goes: last but not least, I want to thank my little brother and my parents. Thank you, Ilkka Seppälä, for showing the way. Honestly, without my father's, Erkki Seppälä, support I would not have done even the first Ph.D. Finally, thank you to my mother, Riitta Seppälä, for her continuous support and encouragement.

Helsinki, September 2022
Laura Seppälä

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Abbreviations

AgNP	Silver nanoparticles
BCI	Better Cotton Initiative
BSCI	Business Social Compliance Initiative
CAP	Climate Action Programme of European Outdoor Group
CSR	Corporate social responsibility
DEET	N,N-diethyl-meta-toluamide
DWR	Durable water repellency
EMF	Ellen MacArthur Foundation
EOG	European Outdoor Group
EPIS	Voluntary environmental product information schemes
FAQ	Frequently asked questions
FEM	Higg Index Facility Environment Module
FLA	Fair Labor Association
FSC	Forest Stewardship Council
FSLM	Higg Index Facility Social and Labor Module
FWF	Fair Wear Foundation
GHG	Greenhouse gas
GLWC	Global Living Wage Coaliation
GOTS	Global Organic Textile Standard
GRI	Global Reporting Initiative
GRS	Global Recycled Standard
ILO	International Labor Organization
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
MNPs	Metal nanoparticles
NGO	Nongovernmental organizations
OECD	Organization for Economic Co-operation and Development
OIA	Outdoor Industry Association
PET	Polyethylene terephthalate
PETA	People for the Ethical Treatment of Animals
PFAS	Per- and poly-fluoroalkyl substances
PFCs	Per- and polyfluorinated chemicals
PFOA	Perfluorooctanoic acid

PLA	Polylactic acid
POW	Protect Our Winters
PVC	Polyvinyl chloride
PWS	Patagonia Wool Standard
RDS	Responsible Down Standard
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RSCM	Responsible supply chain management
RSL	Restricted Substance List
RWS	Responsible Wool Standard
SAC	Sustainable Apparel Coalition
SA8000	Social certification program of Social Accountability International
SCM	Supply chain management
SGS	Société Générale de Surveillance
SSCM	Sustainable supply chain management
u-PSS	use-oriented product-service systems
UN	United Nations
UNGP	United Nations Guiding Principles
UPF	Ultraviolet Protection Factor
UV	Ultraviolet radiation
UVA	Type A ultraviolet radiation
UVB	Type B ultraviolet radiation
WWF	World Wildlife Fund, Inc.
ZDHC	Zero Discharge of Hazardous Chemical

1 INTRODUCTION

This research investigates responsibility and sustainability in the outdoor clothing industry. Due to the state of the world, sustainability is an urgent topic in all industries, and the outdoor clothing industry is not an exception. Clothes are a fundamental human need, but several opportunities for improvement exist across the clothing life cycle. The demands for responsibility and sustainability are particularly high for technical outdoor clothing, which is more complex than casual clothing and has a long supply chain. Therefore, the goal of this study is to obtain a complete understanding, through website communication of the outdoor brands, of the issues related to responsibility and sustainability in the outdoor clothing industry.

This introductory chapter begins by presenting the importance of the topic, explaining the state of the world and why the topic has become critical. It also defines the terms responsibility and sustainability. Furthermore, I introduce the sustainable development goals set by the United Nations and present a holistic understanding of the responsibility in general and for the outdoor industry in particular. This chapter continues with an explanation of previous work and personal interests, presenting my personal curiosity and concern about the topic. Then, my past work, in which I created a model for sustainable outdoor clothing, is described. This chapter includes also previous work, research paradigm, context, and research questions. Finally, the chapter concludes with a description of this dissertation's structure.

1.1 The importance of the topic

The state of the world is critical in various ways and obtaining a holistic picture may therefore be difficult. Various severe environmental and social problems co-exist, including climate change, overconsumption, and the violation of human rights, many of which are interlinked. The **United Nations** (**UN**) is "*an intergovernmental organization whose purpose is to maintain international peace and security*" and encourage human rights and fundamental freedoms.[1] To evaluate scientific research on climate change, the UN established the Intergovernmental Panel on Climate Change (IPCC).[2] The IPCC published its Assessment Report Six in 2022, opening

1 United Nations, 2022a
2 Intergovernmental Panel on Climate Change, 2022b

the press release for the report with the following statement: "*The time for action is now. We can halve emissions by 2030.*"[3]

While the report revealed that global warming could no longer be limited to less than 1.5 °C, it did provide an encouraging message. The chair of IPCC, Hoesung Lee, claimed, *"We are at a crossroads. The decisions we make now can secure a liveable future. We have the tools and know-how required to limit warming.*"[4] However, climate change is only one example of environmental challenges, and sustainable development requires sustainable consumption that ensures environmental and social needs now and in the future.[5] Overconsumption is an enormous challenge to sustainability. Global Footprint Network, an international research organization, calculates the number of days Earth's biocapacity provides for humanity's ecological footprint each year. The organization introduced Earth Overshoot Day, which represents the day in a year when humanity's consumption exceeds Earth's capacity to regenerate. For example, in 2021, Earth Overshoot Day was July 29.[6] Earth Overshoot Day can be counted using the following formula: "*(Earth's Biocapacity/ Humanity's Ecological Footprint) x 365 = Earth Overshoot Day"*[7]

According to Borg, Mont, and Schoonover, one reason for unsustainable consumption is linear business models, in which products are designed to be disposed of after a short usage period.[8] Another worldwide problem is the violation of human rights. The UN published the Universal Declaration of Human Rights in 1948, after World War II. This declaration describes general human rights and rights related to work, work conditions, and equal pay.[9] Although these rights were instituted over 70 years ago, they remain an enormous challenge.

These three highlighted challenges, climate change, overconsumption, and human rights violation, are only a few examples of topical issues. However, the solution to all these challenges is sustainability and responsibility thinking. Sustainability is not a new concept; the most famous and classic definition of sustainability was published in the World Commission Environment and Development report (i.e., the Brundtland report) in 1987. The report defined sustainability as follows: *"Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* The concept of sustainability can be approached on three levels: global, national, and individual.

The terms "*sustainability"* and "*sustainable development"* differ slightly in meaning. Sustainable development is the means to sustainability. Sustainability

3 Intergovernmental Panel on Climate Change, 2022b, 1
4 Intergovernmental Panel on Climate Change, 2022b, 1
5 Sesini et al., 2020, 1
6 Earth Overshoot Day, 2022
7 Earth Overshoot Day, 2022
8 Borg et al., 2020, 1
9 United Nations, 2022b

can also be divided into areas: environmental, social, and economic sustainability. Purvis, Mao, and Robinson researched the history of sustainability but were unable to find a source for these three circles of sustainability.[10] They suggested that Barbier might have first presented this division of sustainability in 1987.[11] The three circles of sustainability are often depicted as overlapping because they affect each other. Environmental sustainability ensures that no harm is done to the environment, while social sustainability defends human rights. Finally, economic sustainability means that companies grow without losing their integrity.[12] This framework of environmental, social, and economic sustainability is also called the "triple bottom line" and is used to measure companies' sustainability performance.[13]

A current buzzword among companies is *responsibility*. According to the Cambridge Dictionary, responsibility means *"something that it is your job or duty to deal with."*[14] This definition of responsibility is well suited to environmental and social challenges. Companies have a responsibility to ensure that their operations do not cause any harm to either the environment or the people living in it.

Environmental responsibility is a company's obligation toward the environment. It includes, for example, greenhouse gas emissions, waste management, water usage, and product end-of-life responsibilities. A company's social responsibility entails helping society and not harming individuals through its operations. Although corporate social responsibility (CSR) is a common term for the socially responsible actions of a company,[15] Köksal, Strähle, and Müller claimed in 2018 that social responsibility had gained much less attention in sustainable supply chain management research and literature than environmental topics.[16]

Doheny and Griffith published research about corporate social responsibility (CSR) in 2017 in which they concluded that companies have much work to meet their CSR goals. In their case study, they researched companies' CSR policy planning, implementation, and reporting, stating that it remains unclear what motivates companies to engage in CSR actions.[17] Nevertheless, many outdoor companies take corporate responsibility seriously. In 2018, Timberland's director of sustainability, Colleen Vien, stated, *"In our view, responsibility also means protecting and enhancing the outdoors, and the communities around the world where we live, work and explore."*[18]

10 Purvis et al., 2019, 681
11 Barbier, 1987; Purvis et al., 2019, 681
12 Maia et al., 2013, 184
13 Reilly & Larya, 2018, 621; Shen et al., 2017, 1
14 Cambridge Dictionary, 2022
15 Winter & Lasch, 2016
16 Köksal et al., 2018, 2
17 Doheny & Griffith, 2017
18 Scarano, 2018, 1

In 2017, Diddi and Niehm found a potential link between employees' personal values and a company's CSR actions.[19] Similarly, in 2016, LoMonaco-Benzing and Ha-Brookshire discovered that clothing company employees desired to uphold their personal values in the workplace and were therefore willing to find solutions for responsibility challenges.[20] Moreover, in 2018, Pedersen, Gwozdz, and Hvass found that organizational values and business model innovation are related.[21] Additionally, top management's commitment to sustainability is a significant driver that increases textile and clothing companies' sustainability involvement and actions.[22]

Responsibility and sustainable development are vast issues. To address these issues, in 2015, the United Nations Department of Economic and Social Affairs published 17 goals for sustainable development to be achieved by 2030.[23] The Paris Agreement, also made in 2015, influenced these Sustainable Development Goals.[24] The goals were published in a report titled *"Transforming Our World: The 2030 Agenda for Sustainable Development."* The report highlights five key aspects (people, planet, prosperity, peace, and partnership) related to three areas of sustainable development (environmental, social, and economic).[25]

Goal 12 of the 17 Sustainable Development Goals aims to ensure sustainable patterns of consumption and production.[26] This includes, for example, sustainable management, efficient use of resources, sound management of all chemicals, and waste reduction through different methods, such as recycling.[27] The UN Sustainable Development Goals guide companies in their responsibility decisions. VF Corporations, which owns The North Face, Timberland, Vans, and Dickies brands, stated that they want to align their projects with the UN Sustainable Development Goals. They identified three key areas to which they are committed: *"Sustainable products and materials, sustainable operations and supply chain, and natural carbon sinks."*[28]

In addition to food and shelter, clothing is one of the needs of survival. Therefore, the need for the clothing industry is justified. Nevertheless, the textile and clothing industry is one of the most polluting industries globally. The industry has severe, interrelated, and complicated problems, including greenhouse emissions, chemical use, water shortage, and human rights violations.[29] Additionally, long and complex

19 Diddi & Niehm, 2017, 14
20 LoMonaco-Benzing & Ha-Brookshire, 2016, 17
21 Pedersen et al., 2018, 279
22 Peters & Simaens, 2020, 26
23 Borg et al., 2020, 1
24 Valente & Atkinson, 2018, 324
25 United Nations, 2015
26 United Nations, 2015, 26
27 United Nations, 2015
28 Friedman, 2021,1
29 Boström & Micheletti, 2016, 1; Diekel et al., 2021, 1

supply chains make the clothing industry complicated, and sustainability must be considered for all stages.[30]

The environmental movement in the clothing industry began with the use of organic or environmentally friendly materials. Now, the sector must examine its business operations and identify ways to use fewer resources.[31] Outdoor clothing production faces various general clothing production challenges, as well as challenges unique to the industry. For example, while the production cycle can be incredibly short in fast fashion, it is generally longer in outdoor clothing production due to more technical fabrics and features in the design. Furthermore, Durgusch and Ward stated in 2010 that sustainability is a particular concern of the outdoor industry.[32]

While the impact of the clothing industry has become more serious, consumers' awareness of impacts of clothing production has also increased,[33] and this rising consumer awareness affects companies' business models. For example, aware consumers tend to buy less but are interested in alternative services, such as repair services, recycling programs, and changeable accessories that can extend the product's life cycle.[34] Two terms frequently used in the context of clothing life span are *linear economy* and *circular economy*. The term linear economy is used for the cradle-to-the-grave model, in which the material has only one life cycle. In 2021, Ki, Park, and Ha-Brookshire defined this linear economy as a *"take-make-use-throwaway"* system.[35] In contrast, a circular economy includes reusing, repairing, refurbishing, and recycling, with the essential component being recycling material for new use.[36] Also known as the cradle-to-cradle model, the circular economy was popularized by McDonough and Braungart in their 2002 book *Cradle to Cradle: Remaking the Way We Make Things*.[37]

Other terms commonly used in this context are *upcycling* and *circular design*.[38] Upcycling means that fabric suppliers can recycle material for use as a new material for similar purposes. This is the opposite of downcycling, in which material is recycled into lower quality and different functionality than the original material. In circular design, upcycling is planned in the design stage. Another approach to sustainability is the consumption of products. For example, Botsman and Rogers popularized the concept of collaborative consumption in their 2010 book titled *What's Mine Is Yours: The Rise of Collaborative Consumption.*[39] *Collaborative consumption, as opposed*

30 Costa et al., 2020
31 Tucker, 2008, 1
32 Dargusch & Ward, 2010, 92
33 Diekel et al., 2021, 1
34 Lundblad & Davies, 2016, 160
35 Ki et al., 2021, 1122
36 Hemantha Y, 2021, 34
37 McDonough & Braungart, 2002
38 Hemantha Y, 2021, 37
39 Botsman & Rogers, 2010

to ownership, can have enormous benefits for sustainability and can also save time and space and improve engagement with other people.[40]

Discussions on climate change and responsibility that affect consumer decisions have become more common, and transparency regarding responsibility and production has become a typical consumer demand.[41] Brand loyalty, brand awareness, the quality of brand (as perceived by consumers), and brand associations form the concept of brand equity.[42] Brand equity is closely linked to the responsibility and sustainability actions of the companies, as these companies aim to make decisions and take actions that positively influence their brand equity.

In 2017, Abbasi stated that, although companies increasingly demand environmental and social responsibility actions from their supply chains, what those specific actions are and how responsibility is divided between stakeholders remain unclear.[43] In 2015, Boström claimed that companies respond to the increasing demand for responsibility in different ways. The worst-case response is adopting greenwashing, in which incorrect or misleading information is given purposefully or intentionally to draw attention away from responsibility challenges. In contrast, companies can adopt sustainable supply chain management (SSCM) and practice extended responsibility (i.e., responsibility is assumed for actions beyond those that are required by legislation). However, long global supply chains are a significant challenge for successful SSCM. Boström also identified chemical management as important for workers and end-users,[44] as chemicals are widely used in textiles and the entire textile industry is chemical-intensive. Moreover, outdoor clothing fabrics using higher amounts of chemical substances because many of the functional features of this clothing are achieved using chemical properties.[45]

Regardless of consumer awareness, corporate responsibility has become mandatory; companies are responsible for their supply chains and products whether consumers demand sustainability from them or not. In 2017, Ha-Brookshire et al. claimed that companies have a moral responsibility to adopt SSCM and care for environmental and human rights. However, because of the nature of global supply chains, challenges to adopting these actions are prevalent.[46] In 2010, Dargusch and Ward concluded that one reason for implementing sustainable supply chain management is intense scrutiny; external forces are almost forcing outdoor clothing companies to engage in responsible actions.[47] Because the outdoor sector is closely

40 Botsman & Rogers, 2010
41 N. L. Kim et al., 2020
42 Aaker, 1991
43 Abbasi, 2017, 261
44 Boström, 2015, 239
45 Boström, 2015 241
46 Ha-Brookshire et al., 2017, 2
47 Paul Dargusch & Ward, 2010, 103

associated with nature, the industry is expected to be environmentally friendly and sustainable. This expectation also makes the outdoor industry an appealing target for environmental activist organizations.[48]

This study is based on outdoor clothing companies' web pages and communication. Responsibility communication is a unique field, and marketing professionals conduct this communication. The demand for transparency is increasing, and many companies have been forced to adopt CSR actions.[49] Thus, companies want to provide a favorable, clear picture of their responsibility actions. One aspect of reliability is the history of a company's actions, although radical changes to the company's actions over a short time are possible. Often, these changes occur due to dramatic and adverse events.[50]

Corporate sustainability reports are the main channel for communicating sustainability actions to consumers, and thus they are increasing in popularity. In 2015, Goswami and Ha-Brookshire claimed that corporate sustainability reports are often published concurrently with financial reports.[51] Global Reporting Initiative (GRI), a globally recognized initiative that publishes standards for impact reporting, aims to help companies maintain transparency and responsibility for their impact.[52]

Clothing brands are aware that they will face problems from consumers if their actions do not meet their sustainability communication and promises. Therefore, clothing brands, especially fast fashion brands, have traditionally avoided communicating about sustainability so that they will not be targeted by aware customers or nongovernmental organizations (NGOs).[53] One aspect of responsibility communication is educating consumers about greenwashing issues and explaining the actions the company has taken regarding a specific responsibility matter. However, Dickenbrok and Martinez emphasized that targeting other brands' greenwashing might be a double-edged sword, possibly including risk.[54]

This study focuses on the environmental and social sustainability challenges associated with the outdoor industry. Economic sustainability is equally essential, but it is not within the scope of this work. Costa et al. stated that environmental sustainability is economic sustainability; activities that are good for the environment (e.g., reducing the amount of energy and water used) in turn lower costs and boost profitability.[55]

48 Greenpeace, 2017
49 Achabou, 2020, 318
50 Achabou, 2020
51 Goswami & Ha-Brookshire, 2015
52 Global Reporting Initiave, 2022
53 Cristófol Rodríguez et al., 2021,20
54 Dickenbrok & Martinez, 2018, 137
55 Costa et al., 2020, 93

1.2 Personal interests of the researcher

When I worked as a fabric purchaser for an outdoor clothing company in 2006, I became interested in sustainability in the outdoor clothing industry. This interest was particularly piqued by the company's introduction of supposedly ecological fabrics. Subsequently, I began my master's degree studies in 2007 to study sustainability in outdoor gear, and I wrote my master's thesis on this subject. Afterward, I worked as the sustainability manager for the same outdoor clothing brand.

I was then invited to conduct doctoral research in the United Kingdom for the Design for Ageing Well project, which focused on developing a smart outdoor clothing design for older walkers. The primary objective of the initiative was to enable elderly retirees to enjoy the outdoors and go walking. The project and its prototypes also considered sustainability. I focused my research on collaborative design methodologies and cooperation enablers in teamwork, and in 2017, I received my doctorate from the University of Salford.

When I began my initial study, sustainability in the outdoor clothing industry was a relatively new concept. However, a great deal has changed over the previous 15 years. Although the situation is not ideal and goals are changing continuously as knowledge expands, tremendous progress has been made over the previous decade. I enjoy nature, outdoor activities, and outdoor gear. Since I began studying clothing in 2003, I have also had an interest in functional outdoor apparel, and I am fascinated by technical properties and methods of weather protection. My greatest interest lies in responsibility and sustainability; I believe that humanity should live sustainably on this planet and does not have the right to destroy the living environment of other creatures. Thus, human beings should do the utmost to repair the damage they have caused and develop sustainable solutions. The purpose of this research is to gather information that can help raise overall knowledge and encourage responsible and environmentally sustainable behavior.

1.3 The model of sustainable outdoor clothing

My research for my master's degree led to the development of a model for environmentally responsible outdoor gear. This model provided the clearest illustration of my understanding of the various components of sustainability in outdoor gear design (Fig 1.). By studying this model, designers should be able to obtain general knowledge of the considerations needed when creating these designs (Fig. 2.). The primary objective of the model is to identify all aspects of sustainability while accounting for the life cycle of garments.

Based on findings from more recent studies, my model for sustainable outdoor clothing has demonstrated consistency throughout its existence. However, the

triple-bottom-line concept of sustainability has gained more traction in public awareness. When I developed the model, cultural sustainability was generally accepted as the fourth component of the larger concept of sustainability. In this study, I have included it in the concept of social sustainability. This dissertation contains the model in the same format it was presented in my master's thesis in 2010. The fundamental information offered by the model served as my starting point for this study (Appendix 1.).

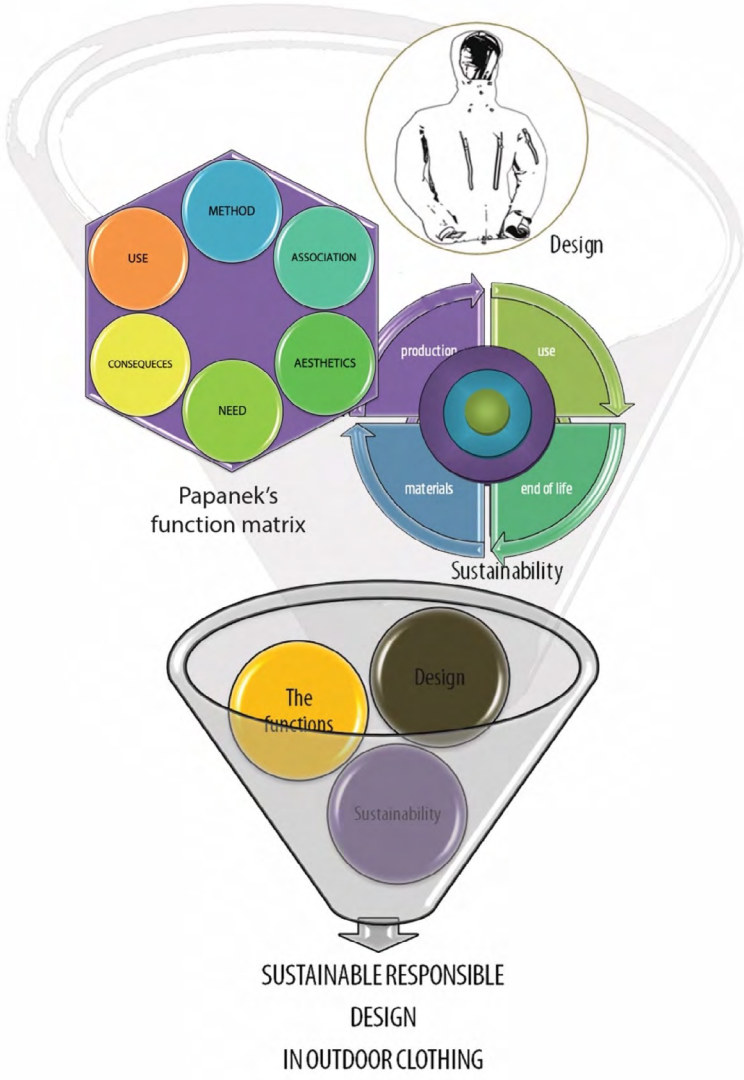

Figure 1. *The model for sustainable clothing combines knowledge of outdoor clothing design, Papanek's six-sided function matrix from 1995 (which includes method, association, aesthetics, need, consequences, and use), and sustainability, which covers the product's entire life cycle (Seppälä 2010, 146).*

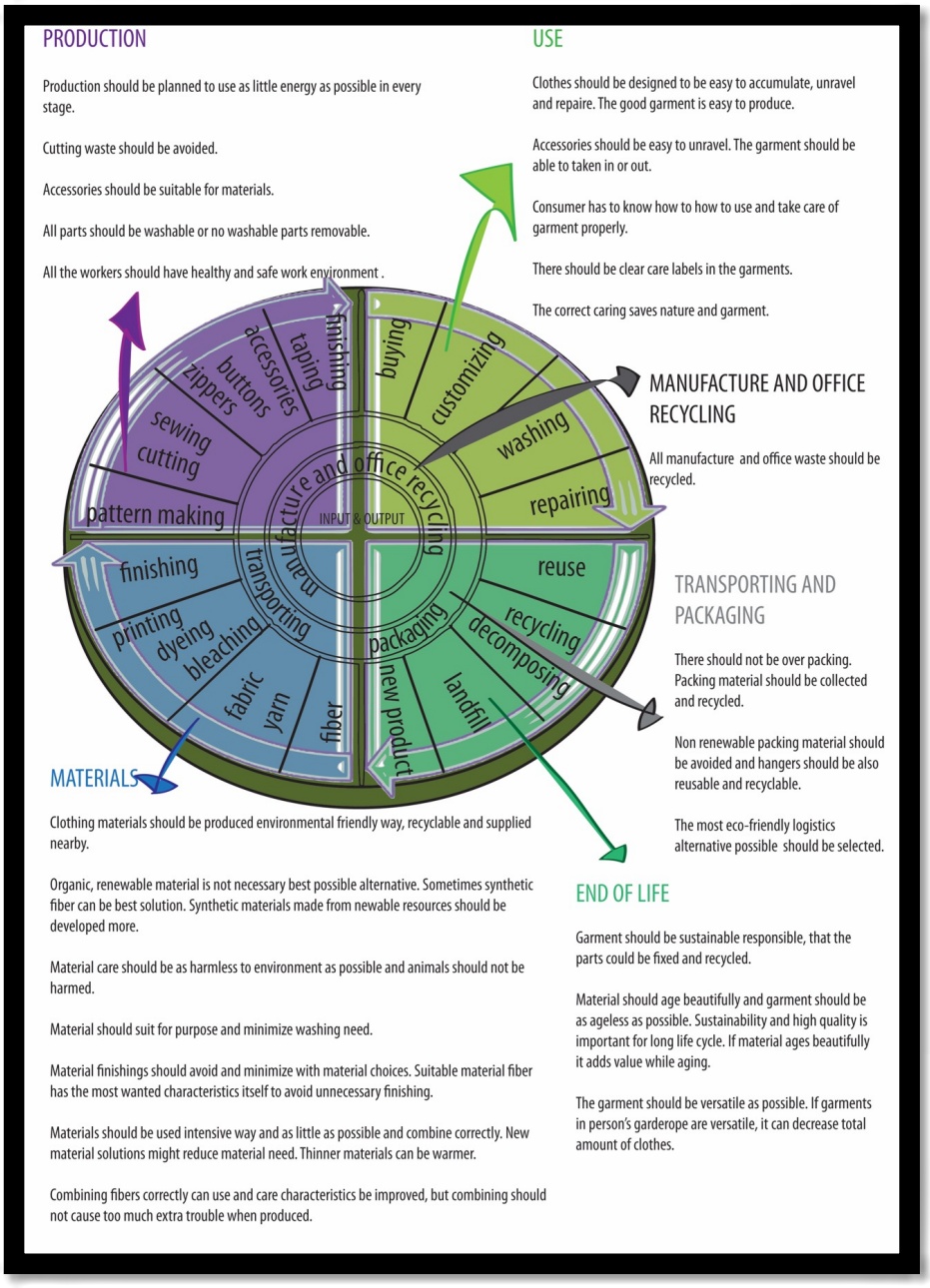

Figure 2. *The model for sustainable outdoor clothing illustrates the complexity of responsibility considerations (Seppälä 2010, 157).*

1.4 Previous work on sustainability in clothing design research and responsibility communication

Over the past decade, the importance of sustainability in the clothing field has become apparent as the number of studies on sustainability and responsibility has grown exponentially. One of the most well-known scholars in the field of fashion and sustainability is Kate Fletcher. Fletcher works as a professor of Sustainability, Design, and Fashion at the Centre for Sustainable Fashion, University of the Arts London. According to Fletcher, the work of assessing the environmental and social impacts of clothing began in the early 1990s;[56] Fletcher stated that when she was completing her Ph.D. research in the 1990s, she could read academic articles about sustainability in fashion and textiles, which is now in 2020s impossible.[57]

Increasing research and knowledge about climate change and environmental problems explains the increasing research on sustainability in the clothing industry. In 2022, Fletcher stated that *"the window for action on climate change under-scores the fact that time is short and that every action counts. Time then for us to move at pace into the broad, inclusive, creative, richly fertile ground opened up when we recognize that to drive long-lasting, life-giving change we must scrutinize fashion-system priorities. Time to employ a new logic, the logic of Earth."*[58] Additionally, tragedy in Bangladesh has impacted corporate social responsibility interests: over 1100 garment workers died in the collapse of the textile manufacturing building Rana Plaza. According to Donaghey and Reinecke, the accident highlighted garment workers' lack of labor rights and problems in the existing auditing systems.[59]

Over the past decade, sustainability has also become a subtopic of design research. For example, London College of Fashion has a department called Fashion Design for Sustainability. Fletcher has written nine books and various articles on sustainability in the clothing industry. According to Fletcher, she is the most cited scholar on clothing sustainability, and Fletcher's book *Sustainable Fashion and Textiles: Design Journeys* is considered a classic. Other essential pieces by Fletcher are the *Routledge Handbook of Sustainability and Fashion* and the *Earth Logic Fashion Action Research Plan.*[60]

Alison Gwilt is a fashion design researcher who has also written several books about sustainability in the clothing field. In 2011, she published a book called *Shaping Sustainable Fashion* with Rissanen.[61] Three of her later books were *A Practical Guide to Sustainable Fashion, Fashion Design for Living,* and *Global*

56 Fletcher 2019, 17
57 Fletcher 2022, 129
58 Fletcher 2022, 131
59 Donaghey and Reinecke 2018, 14-15
60 Fletcher 2015; Fletcher 2019
61 Gwilt & Rissanen 2011

Perspectives on Sustainable Fashion.[62] Gwilt has dedicated her work on sustainable approaches to interrupting the current production and consumption paradigm. After researching users' attitudes and behavior toward their clothing, she made the following conclusion in 2021: *"If the perspectives and behaviours of clothing users were better understood and they informed practices in the industry, brands and retailers could develop relevant products and services that benefit both people and the environment."*[63] User behavior is a complex subtopic of sustainability research, and research on this topic has its own methods, such as online surveys and workshops, which Gwilt has also used in her research.

Two other significant sustainability researchers in the clothing industry are professors at the London College of Fashion. Sandy Black is professor of Fashion and Textile Design and Technology and author of *The Sustainable Fashion Handbook,* which is considered one of the comprehensive classics of sustainability in the clothing industry.[64] Dilys Williams is professor of Fashion Design for Sustainability and works to develop design and business practices for sustainability. Williams has advocated a pluralistic approach to the study of fashion and sustainability while highlighting the need for better understanding the aims of creating, buying, selling, wearing, maintaining, and identifying with certain types of clothing.[65]

Two Finnish sustainability researchers are Kirsi Niinimäki and Timo Rissanen. Both are associate professors and have written various publications, including books and articles. Niinimäki earned her doctoral degree from Aalto University in 2011, while Rissanen completed his Ph.D. at the University of Technology Sydney, Australia. They cowrote an article called *The Environmental Price of Fast Fashion* with Gwilt and others. In the article, they examined various issues, from water and chemical use to waste.[66]

In the previous research on different outdoor brands, Patagonia has been researched significantly more than any other brand. Moreover, founder of Patagonia, Yvon Chouinard, has written, both alone and with others, several books about activism, sustainability actions, and responsible business in Patagonia.[67] *The Responsible Company*, written by Chouinard and Stanley, is a comprehensive guidebook for other brands and people interested in corporate responsibility. Chouinard and Stanley cited Gerald Amos in the front page of their book: *"The most important right we have is the right to be responsible."*[68]

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62 Gwilt 2015; Gwilt 2016; Gwilt, Payne, & Rüthschilling 2019
63 Gwilt 2021, 880
64 Black 2012
65 Williams 2019
66 Niinimäki, Peters, Dahlbo, et al. 2020
67 Gallagher, Myers, & Chouinard, 2016; Chouinard, Conley & Miller 2018; Chouinard, 2019
68 Chouinard & Stanley 2012

Bhaduri and Ha-Brookshire researched brand responsibility communication in 2017 and found that brands use multiple sources to provide information for customers. Besides static webpages, catalogs, and reports, this information can be printed on hangtags and product packages.[69] In 202, Bhaduri and Copeland researched consumers' brand evaluations and suggested that transparency might benefit brands.[70] Additionally, Childs, Woo, and Kim studied corporate social responsibility campaigns, brand authenticity, and the brands' perceived sincerity from the consumer's point of view in 2019. They found that the image of the brand impacts the credibility of its responsibility message.[71]

Numerous doctoral dissertations on sustainability have been published in Finland over the past ten years. However, fewer are concerned with clothing responsibility and sustainability. Major body of research on clothes is conducted at Aalto University and the University of Lapland. However, the subjects are frequently craft and user-focused. For example, Markkula made a doctoral dissertation on responsible consumption in 2011.[72] Karell's doctoral dissertation from 2021 was on the circular economy.[73] Mahmood from the University of Oulu researched sustainable supply chains in 2020, and Durrani from Aalto University researched garment mending. In my investigation, I was unable to locate another PhD dissertation on the subject of the responsibility of outdoor clothing.

In conclusion, a vast number of books and research articles on corporate environmental and social responsibility in the clothing field have been published. Various subtopics of sustainability also exist, including supply chain sustainability and responsibility, consumer behavior, and responsibility communication. Furthermore, forerunner outdoor brands have been studied from different angles. However, a longitudinal study of outdoor companies' responsibility communication from a holistic perspective that considers both environmental and social perspectives is lacking.

1.5 Research paradigm

Every research study has an underlying paradigm or worldview. According to Kivunja and Kuyini in 2007, the word *paradigm* originates in Greek and means pattern.[74] In 2019, Abdullah defined paradigm as the researcher's beliefs and values in relation to the world. Therefore, explaining how a paradigm applies to this

69 Bhaduri & Ha-Brookshire 2017, 306
70 Bhaduri & Copeland 2021, 95
71 Childs, Woo & Kim 2019
72 Markkula 2011
73 Karell 2021
74 Kivunja & Kuyini, 2017, 1388

research is beneficial. Research paradigms consist of the research philosophy and methodology. Denzil and Lincoln delineated the components of a research paradigm as follows: *"Paradigms as basic belief systems based on ontological, epistemological, and methodological assumptions."*[75] According to Morgan, a paradigm includes ontology, epistemology, and methodology.[76] Denzil and Lincoln further explained, *"A paradigm may be viewed as a set of basic beliefs (or metaphysics) that deals with ultimates or first principles."*[77]

Research philosophy comprises ontology and epistemology, which are distinguished by the questions to which they respond. Ontology addresses the query *"What is reality?"* while the answer to the question *"How is it possible to know reality?"* is provided by epistemology.[78] This differentiation was further explained by Denzin and Lincoln's 1994 definition of the ontological question: *"What is the form and nature of reality, and, therefore, what is there that can be known about it?",* compared to the epistemological question: *"What is the nature of the relationship between the knower or would-be knower, and what can be known?"*[79] Bryman explained that epistemology is concerned about acceptable knowledge in certain disciplines.[80]

Research methodology determines how the answer to the research question is found, and it includes data collection and analysis methods. According to Denzin and Lincoln, the methodological question is *"How can the inquirer (would-be-knower) go about finding out whatever he or she believes can be known?"*[81]

In 2019, Kaushik and Walch highlighted that every paradigm has a different approach to ontology, epistemology, and methodology.[82] The pragmatic paradigm suggests that reality is continually interpreted. In 2018, Gross credited the concept of pragmatism as it existed in the late nineteenth and early twentieth centuries to Charles Sanders Peirce, William James, John Dewey, and George Herbert Mead, among others.[83] According to Kaushik and Walch, the origins of pragmatism lie within the Dewey's five-step model, created in 1933 and revised in 2014 by Morgan.[84] Here, I have combined Morgan's steps verbatim with explanations given by Kaushik and Walch.

The first step of the research is: *"Recognizing the situation as problematic"*[85] This model initially consists of encountering a scenario and recognizing it as a research

75 Denzin & Lincoln, 1994, 107
76 Morgan, 2014, 1045
77 Denzin & Lincoln, 1994, 107
78 Denzin & Lincoln, 1994, 108
79 Denzin & Lincoln, 1994, 108
80 Bryman, 2012, 13
81 Denzin & Lincoln, 1994, 108
82 Kaushik & Walsh, 2019, 1
83 Gross, 2018, 87
84 Kaushik & Walsh, 2019, 8
85 Morgan, 2014, 1047

challenge. However, the problem can lay outside the realm of the researcher's present expertise. Consequently, the researcher may not have only one strategy to handle the research challenge.[86] In this study, the problematic scenario to be addressed is the complexity of responsibility issues in the outdoor clothing industry. Understanding the entire picture of sustainability requires considering environmental and social responsibility actions; these two are often interlinked and were, therefore, both included this study.

The second step is *"considering the difference it makes to define the problem one way rather than another."*[87] In the second step, the researcher must evaluate the nature of the problem in light of previously established concepts. Occasionally, the process of reflection may result in revision of the problem and restatement of the initial research question.[88] In this research, responsibility was investigated through environmental and social aspects. Additionally, the entire life cycle and supply chain were addressed as known concepts. This research acknowledges that the data are based on the brands' communication.

The third step is *"developing a possible line of action as a response to the problem."*[89] This entails considering the various actions that could be taken, such as the many approaches that the research can use to solve the research question, as well as the potential layout of the research.[90] Because the forerunner brands illustrated the current state of the industry well, a case study methodology was selected. The strength of the case study methodology is in-depth knowledge about the cases.

The fourth step is *"evaluating potential actions in terms of their likely consequences."*[91] In this step, the researcher evaluates different research methods to determine which would be most effective in answering the research question.[92] For this study, content analysis of websites' marketing material was chosen as the most equal and informative for this study. Alternative approaches included interviewing or focus groups, responsibility reports, other marketing material (e.g., printed catalogs), social media marketing, and online discussions.

The fifth step is *"taking actions that are felt to be likely to address the problematic situation."*[93] Conducting the research constitutes the fifth phase of the model. However, the researcher likely will need to return to the previous step as a result of the just-completed process, as considering the choice of methods may require reevaluation of the research design, which in turn may require reevaluation of the

86 Kaushik & Walsh, 2019, 8
87 Morgan, 2014, 1047
88 Kaushik & Walsh, 2019, 8
89 Morgan, 2014, 1047
90 Kaushik & Walsh, 2019, 8
91 Morgan, 2014, 1047
92 Kaushik & Walsh, 2019, 8
93 Morgan, 2014, 1047

research question at the initial phase of the process.[94] In this study, the research process included collecting, coding, and analyzing data from websites.

Regarding their revision of the model, Morgan, Kaushik, and Walsh stated that the researcher may complete multiple iterations "*of designing the research, selecting the methods, reflecting on the choices made,*" and rethinking the research question before proceeding to step five, which entails conducting the research. In pragmatism, this technique is known as "abduction." It is predicated on the assumption that if the study is conducted in a particular way, the researcher will likely acquire a particular set of results.[95] In 2010, Feilzer argued that researchers must be aware from the onset that the data collected in the course of the study may not match the research question as well as expected, which can indicate uncertainties and unaccounted-for human factors. However, researchers should not forsake the original research question and *"simply answer another one";* rather, the findings require reflection and abductive reasoning, and the research techniques or underlying theory require refining or reevaluation.[96]

1.6 Research context

The understanding that people are the root cause of climate change, environmental, and social responsibility concerns serve as the foundation for this study. Although responsibility problems are widespread, people can still affect them and change the currently adopted methods. Therefore, ensuring that stakeholders are aware of the most effective methods may increase the likelihood that they will modify their practices and procedures. Companies in wealthy western countries play a significant role in improving sustainability issues. However, although the responsibility for production lies primarily with the industry, consumers also play a considerable role as companies tend to sell what consumers want to buy. The outdoor industry is unique because its business is based on spending time outdoors and engaging with nature. This affects customers' awareness and shopping practices.[97]

This research investigates environmental and social sustainability issues since responsibility encompasses a wide range of topics. How humans wish to interact with others is directly tied to their sense of social obligation. The rights of animals should also be considered by the outdoor industry; the production of outdoor apparel should not come at the price of animals' pain and distress. Although using a variety of chemicals is necessary for guaranteeing the quality of outdoor clothing,

94 Kaushik & Walsh, 2019, 8
95 Kaushik & Walsh, 2019, 8
96 Feilzer, 2010, 14
97 European outdoor group, 2020

manufacturers of this clothing must ensure the safety of both the environment and the people who use their products. This research was based on a worldview that acknowledges human responsibility in all its activities, including those of companies and customers. A significant amount of work and collaboration are required for positive change, and diverse collaborative efforts are occurring across businesses, organizations, and standards.

Some of the outdoor companies selected for this study have been forerunners in these efforts. However, they recognize that the work is just beginning, and that the outdoor industry has a considerable amount of work to do. Actions are needed in the areas of both environmental and social responsibility. This work aims to paint an overall picture of the extent of this responsibility. Such a holistic approach may prevent greenwashing as one of the most common greenwashing techniques is to focus attention on a single issue without considering the entire picture.[98]

This study relies on the fact that a holistic understanding of issues creates change and encourages one to make better choices. Many responsibility issues have already been resolved, and the best practice is already known. Although, many companies do not follow the best practices yet. However, the area of responsibility is broad, and the legislaton is constantly changing.

1.7 Research questions

This qualitative study explores responsibility actions taken by 12 outdoor companies between 2009 and 2021 according to their web pages. These companies were Arc'teryx, Columbia Sportswear Company, Fjällräven, Haglöfs, Houdini, Howies, Jack Wolfskin, Millet, The North Face, Patagonia, Peak Performance, and Sierra Designs.

When the study began in 2007, I conducted an online search of outdoor companies that mentioned sustainability on their websites. These 12 seemed to be forerunners because they had considered sustainability in some way. For unknown reasons, Swedish companies were overrepresented. At the time, no Finnish outdoor company mentioned sustainability on its website.

This study investigated these companies' public communication about responsibility on their websites from 2009–2021. This information did not necessarily correlate with actions they had completed or had taken but did not mention publicly. The objective of the study is to understand how responsibility actions have improved over 12 years. The three research questions are as follows:

1. What were the responsibility actions of the selected outdoor clothing brands according to their webpage in 2009?

98 Better World Apparel, 2022

2. What were the responsibility actions of the selected outdoor clothing brands according to their webpage in 2021?

3. How has the selected outdoor companies' websites' communication changed regarding sustainability and responsibility between 2009 and 2021?

The data required to answer the first question were collected for my master's thesis in 2009. Early in 2021, the data for the second and third questions were collected. The results are reported in the Results chapter and reviewed in the Discussion and conclusions chapter.

1.8 The structure of this dissertation

This dissertation includes five chapters. In the first chapter, Introduction, I discussed the significance of the subject matter and my individual interests. In the previous section, I discussed the model for long-term sustainability. In the Research Questions section, I provided the three research questions this study aimed to answer.

The second chapter presents the theoretical context for the subject. This chapter is divided into six sections that each provide a new perspective on the topic of sustainability in the outdoor clothing sector.

The third chapter describes the worldview that guided the research. Other topics covered in this chapter include the research techniques, the selection of study data, and the gathering and analyzing of the data.

The results of this study are explored extensively in the fourth chapter, which is titled Results. Findings concerning the fundamentals of designing outdoor clothing, environmental and social responsibility, different responsibility stakeholders, and collaborators in the outdoor industry are presented in this chapter.

The final chapter includes the discussion and conclusions and is divided into four sections. These sections provide a synopsis of the most important findings, ethical considerations, evaluations, and conclusions drawn from the research.

2 THEORETICAL BACKGROUND

Responsibility and sustainability are complex concepts, and in this study, they are discussed in relation to the outdoor clothing industry. Existing knowledge and theories are essential to any research, and therefore, I aim to present relevant topics to environmental and social sustainability in the outdoor clothing industry. Economic sustainability is the third dimension of sustainability, but it is outside the scope of this research. Additionally, some models have suggested that cultural sustainability is the fourth dimension of sustainability, but previously, it was included in social sustainability. This literature review aims to outline the background of this study to enhance the understanding of the research's context. This chapter is divided into six sections.

The first section introduces outdoor clothing design. Functional sportswear clothing has unique features compared to other types of clothing, and these features are presented in this section. The second section presents key issues affecting the outdoor clothing industry and explains this work's rationale. Many interrelated and irrelated challenges exist in the outdoor clothing industry. The section aims to provide a holistic picture of these problems.

The third section, Environmental Responsibility, introduces the main aspects of how outdoor clothing can affect environmental sustainability. Some of the significant issues include materials, animal welfare, use, and end of use. The fourth section, Social Responsibility, communicates how outdoor clothing production can affect social sustainability. Companies must consider various human rights-related themes.

The fifth section identifies the stakeholders in the outdoor industry, introducing three key players in the outdoor industry. Industry associations are essential for responsibility advancements. The last section, Responsibility Collaboration, presents organizations that collaborate in the outdoor industry. Collaboration is crucial for holistic success in responsibility. These six sections cover the topics relevant to the research questions and provide a holistic picture of this research. Through these sections, this chapter aims to cover the research context holistically.

2.1 Outdoor clothing design

Outdoor clothing design is a complex area of expertise in which various aspects must be considered. In 2007, Blair wrote that understanding the performance requirements of sports apparel is essential for correct fabric choice and design decisions because

the components of the garment affect its performance. Blair used the example of mountaineering, in which clothing can directly affect survival. Although survival may not be at stake in all sports or outdoor activities, clothing has a significant effect on comfort and performance.[99]

Innovations play a significant role in outdoor clothing design. In 2007, Subic stated, *"Design and innovation are inseparable."* Innovation is inevitable due to the nature of sports, which aim for excellence and new achievements. Additionally, new sports are developed continuously, generating the need for new materials, products, and innovations.[100] To create suitable outdoor clothing that users desire, the designer must maintain awareness of a wide range of considerations and make numerous choices. The facets of outdoor clothing design can be divided into aesthetics, functionality, and sustainability of the garment.

McCann created an extensive information tree in 2005 to guide sportswear designers. This information tree provides a holistic picture of the various factors designers must consider and decide. McCann divided these demands into form and style, function, and commercial realities.[101] Form and style are further divided into aesthetics and the culture of the sport. Aesthetics include color, materials, cut, fit, and proportion, which are each divided into even more detailed information. For example, mood, safety, commercial considerations, and environmental impacts can affect color choice. Material choice is crucial because it is affected by the fabric's fiber type and performance factors. Cut, fit, and proportion entail several critical factors: cutting for movement, sizing, garment construction, and details. Finally, the culture of the sport has a significant effect on the form and style.[102]

For example, skiers and snowboarders have typically favored different approaches despite the fact that their activities share similar requirements and occur in the same region. Time also impacts style; preferences on the design and styling of garments evolve over time, and designers must adhere to time and fashion trends. Ten-year-old outdoor apparel can appear outdated, and technological advancements can also impact the aesthetics of clothing.

According to McCann, function is divided into demands of the body and demands of the sport. Demands of the body include protection, ergonomics of movement, and thermophysiological regulation. Demands of the sport are related to the duration of the activity, safety and survival, and the range of likely sporting conditions (i.e., location, season, climate, and transportation).[103] The second aspect of outdoor clothing design, functionality, is also broad. Outdoor clothing faces much more

99 Blair, 2007, 60
100 Subic, 2007
101 McCann, 2005, 56
102 McCann, 2005, 56
103 McCann, 2005, 56

strenuous use than casual wear, so durability must be considered from many angles. Furthermore, outdoor clothing often must be lightweight, and this combination of durability and lightweight increases the complexity of clothing design. Comfort is the third dimension, as outdoor clothing is worn for long periods. Besides all these factors, which each provide challenges, sustainability should be considered for all aspects of outdoor clothing design. Responsibility is also significantly linked to commercial realities, the third dimension in McCann's model. Commercial realities include position, product, price, and promotion.[104]

The conventional concept of outdoor clothing entails a three-layer garment system in which each layer has a distinct role. The first layer, often known as the base layer, is designed to carry perspiration from the skin to the outer layers and to provide thermal protection.[105] The wicking properties of the base layer delay the chilling of the user.[106] The second layer functions as thermal insulation and moves moisture into the outer layer.[107] This layer must trap and store warm air.[108] Finally, the primary purpose of the outer layer is to protect from weather phenomena, such as wind, rain, or snow.[109] If moisture seeps into the clothing system, it substitutes the warm air, and the user becomes wet and chilled.[110] In contrast, when all layers work together, they keep the user dry and warm during the activity outside.[111] Outdoor clothing design is a multifaceted field, and this section illustrated its complexity by highlighting some key issues. Other emerging phenomena include smart clothes, wearable technology, and biomimicry. Because responsible recycling of wearable electronics is a separate issue, these have been purposefully excluded from this research.

2.2 Key issues affecting the outdoor clothing industry

As presented in the previous section, developing outdoor clothes is a complex task. Another branch of knowledge is understanding the entire supply chain and the potential circular economy. Furthermore, understanding the effects of each life-cycle stage represents a vast quantity of knowledge. Consequently, action based on the most recent knowledge of best practices represents an entirely different dimension for outdoor clothing design. The outdoor industry and industry associations are aware of various challenges. One example of this awareness is the

104 McCann, 2005
105 Bramel, 2005, 33
106 Ruckman, 2005, 124
107 Bramel, 2005, 33
108 Ruckman, 2005, 124
109 Bramel, 2005, 33
110 Ruckman, 2005
111 Bramel, 2005, 33

European Outdoor Group (EOG) Annual Report 2021, which includes a chapter on CSR and sustainability. According to the report, "sustainable" is not the end goal but the journey, in which knowledge about the impacts on people and the planet increases along the way. The report also identified five industry aspirations, striving for an industry that is *climate neutral, free from harmful chemicals, responsibly using resources, discharging safe emissions, and maintaining ethical supply chains*.[112] The EOG provided additional details in its 2020 strategy paper. It named transparency, innovation, and circular economy as a paradigm covering all five strategic areas. These areas are listed below verbatim to maintain comprehensibility:

- *"Responsible resource Use: Effective and responsible use of materials, chemicals, and resources.*
- *Safe Emissions: Responsible emissions to air, water, and land (waste).*
- *Ethical Supply Chains: Supply chain welfare for people and animals.*
- *Care for Consumers: Consumer considerations.*
- *Fair Business: Business practice and economic considerations."*[113]

The strategy of EOG and its industry aspirations highlight the wide variety of factors that affect the outdoor clothing industry. For example, the outdoor apparel brand, Patagonia, is considered one of the forerunners of responsibility in the outdoor industry. The company was founded in 1973 by Yvon Chouinard, who published a book with Vincent Stanley in 2012. Chouinard and Stanley created a checklist at the end of this book that companies can use to evaluate their responsibility actions. The checklist is comprehensive, but I will emphasize some points to elucidate this matter.[114]

Chouinard and Stanley divided their checklist into five parts: business health, workers, customers, community, and nature.[115] The business health checklist presents actions toward economic responsibility. Many financial factors, such as sharing financial information with all company employees, exist on the list, but Chouinard and Stanley also included social and environmental training of employees and monitoring the company's responsibility performance in this section.[116] The checklist considering workers includes pay, benefits, and policies and mentions first living wage and the pay gap between the highest and lowest paid employees. Additionally, a variety of other social responsibility targets are given, including insurance, health and safety standards, on-site daycare, and the working environment. Other ideas are an employee handbook including the company's mission, a code of ethics, and

112 European Outdoor Group Annual Report 2012, 2021, 8
113 European outdoor group, 2020
114 Chouinard & Stanley, 2012
115 Chouinard & Stanley, 2012, 95-123
116 Chouinard & Stanley, 2012, 96

anti-discrimination policies. Finally, a job-satisfaction survey is recommended to be shared with everyone to reveal the current state of the company.[117]

The customer checklist entails environmentally friendly, long-lasting, and repairable products. Chouinard and Stanley also recommended, for example, third-party screening, transparency in communication of the progress, and guarantees.[118] The community checklist includes factors by which the company can affect the community. For example, one idea is charitable giving through some trusted organization. The main points consider how to collaborate with suppliers and publish a code of conduct that presents the company's environmental and social responsibility requirements.[119]

The nature checklist is extensive. Independent audits of energy and water use, waste generation, and carbon emissions are among the important recommendations, as is sharing targets and results with all stakeholders. Life-cycle assessment and chemical analysis of the products are recommended to boost understanding and innovation. Rail and maritime freight are identified as preferable to air and truck transportation. The authors also advised returning worn clothing and creating a solution to the waste problem. They provide various recommendations to design more responsibly; use less energy; travel and commute more responsibly; affect heating, air conditioning, and lighting; and use less water, waste, and toxics.[120] This section showed that the outdoor industry is aware of many issues concerning its business. The following section more closely investigates the supply chains.

2.2.1 Supply chain challenges

Apparel designed for use in the outdoors is a complex commodity, and the creation of this clothing subsequently involves lengthy supply chains. The supply chain begins with the production of fiber, followed by the manufacturing of fabric and finally the creation of the garments. Shipping is required at every level, and the process of transporting the garments from the factory where they are made to the store where they are sold is similarly complicated.

According to Svensson, supply chain management (SCM) is a *business philosophy* that intends to combine *the dependent activities*, *actors*, and *resources* to manage them. SCM considers the dependencies of companies, suppliers, and consumers in the channels,[121] and it is an essential operation for many companies across different industries. It meant traditionally business performance, meaning managing the production's timetables, efficiency, and stability.[122] The supply chain

117 Chouinard & Stanley, 2012, 97-101
118 Chouinard & Stanley, 2012, 102
119 Chouinard & Stanley, 2012, 103-105
120 Chouinard & Stanley, 2012, 106-123
121 Svensson, 2007, 263
122 Xu et al., 2019, 857

challenges have led to the creation of a new concept for controlling environmental, social, and economic sustainability in the supply chain: responsible supply chain management (RSCM).[123] Another term used in this context is sustainable supply chain management (SSCM).[124]

SSCM is necessary do to several sustainability-related challenges in the supply chains. In 2016, Giannakis and Papadopoulos conducted research on these challenges and identified the following sustainability-related risks related to supply chains: *natural disasters, greenhouse gas emissions, child and forced labor, financial crisis, bribery allegations, pollution, non-compliance with sustainability laws, and energy consumption.*[125]

However, environmental responsibility in the supply chains can be improved in various ways. In 2022, Elalem, Bicer, and Seifert claimed that production significantly affects the product's footprint because Earth's resources are used unnecessarily and the production causes greenhouse gas emissions. They suggested three ways to decrease environmental harm: lead-time reduction, quantity-flexibility contracts, and multiple sourcing.[126] Although environmental hazards and immediate death are not comparable, a lack of social responsibility can wreak negative consequences in the worst-case scenarios. For example, one of the most critical aspects of the supply chain is workers' health, safety, and lives. Improper manufacturing facilities and workplace safety can create a lethal working environment.[127]

Various solutions to the challenges in the supply chain also exist, one of the most efficient of which is collaboration and communication. In 2016, Oelze et al. found that collaboration between industry, suppliers, and nongovernmental organizations is needed for companies' organizational learning of RSCM. Additionally, collaboration with NGOs and other partners may increase knowledge of best practices.[128] In 2019, Mehdikhani and Valmohammadi highlighted that internal and external knowledge sharing is necessary for strategic collaboration in the management of a sustainable supply chain.[129] The environmental and social challenges are presented in more detail in the following sections.

2.2.2 Environmental challenges

This study discusses only human-caused environmental challenges. Thus, this theoretical background focuses on environmental concerns generated by human conduct rather than by natural disasters. Humans can wreak havoc on the environment

123 Oelze et al., 2016, 242
124 Mehdikhani & Valmohammadi, 2019, 778
125 Giannakis & Papadopoulos, 2016, 460
126 Elalem et al., 2022, 13
127 Prentice et al., 2018, 157
128 Oelze et al., 2016, 254
129 Mehdikhani & Valmohammadi, 2019, 785, 793

in a variety of ways, and climate change, pollution, and waste management are examples of human-caused environmental concerns. Other examples include ocean acidification, freshwater scarcity, biodiversity loss, deforestation, and energy production issues. The following section briefly discusses climate change.

Climate change

The phenomena of climate change and global warming are often confused, but the terms have different meanings. "*Climate change"* means "*a long-term change in the average weather patterns with different effects,"* while *"global warming"* means "*long-term heating of the Earth's climate system."*[130] *Both terms were adopted in the 1980s. The World Health Organization has called "climate change the greatest threat to global health in the 21st century."*[131] *The terms climate crisis*, *climate emergency*, and *global heating* are sometimes used to highlight the urgency of climate change. Oxford Languages, which chooses a timely word of the year, chose *"climate emergency"* in 2019, defining it as follows: *"A situation in which urgent action is required to reduce or halt climate change and avoid potentially irreversible environmental damage resulting from it."*[132] *Greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, are the primary contributors to the current state of climate change.*[133] *These gases are created mainly through human activities in which fossil fuels are burned.*[134] *The production of greenhouse gases contributes to global warming because these gases prevent heat from escaping into space.*[135]

Global warming has already resulted in visible changes, which may have severe and diverse direct and indirect consequences. For instance, global warming will trigger significant droughts, desert expansion, heat waves, and wildfires. Additionally, ocean habitats are being impacted by melting permafrost, glaciers, and sea ice. Intense storms and other extreme weather are caused by higher temperatures. Forecasts indicate that, if global warming continues, humans and ecosystems will face severe and permanent consequences. Global warming is an industrial issue, and many businesses can cut their energy demand in various ways. One such method is designing energy-efficient goods with longer lifespans. Additionally, global warming can be delayed by developing greenhouse gas sinks that absorb greenhouse gases from the atmosphere. A carbon footprint is the total amount of greenhouse gases (GHG) produced by an individual, event, organization, service, location, or product.[136]

130 California Institute of Technology, 2022
131 World Health Organization, 2022
132 Oxford Languages, 2022
133 IPCC, 2014
134 California Institute of Technology, 2022
135 California Intitute of Technology, 2022
136 Hoegh-Guldberg et al., 2018

The outdoor industry has also acknowledged its role in addressing climate change and has employed a dual strategy to address this problem. The outdoor industry can impact production, transportation, and the entire supply chain, and it can heighten awareness of climate change. European Outdoor Group's Annual report for 2021 mentioned climate change, taking environmental and social crises seriously: "*The carbon footprint related to the production of outdoor apparel, footwear, and hard goods is significant.*" EOG subsequently launched its Climate Action Program (CAP) in early 2021.

The outdoor industry recognizes that human activity is a contributor to climate change based on currently available evidence. Responsible companies are establishing climate targets, and trade organizations are attempting to support the work that these companies are doing. Additional concerns associated with the outdoor apparent sector include the utilization of water and chemicals, asset stripping, transportation, offices, retail outlets, and waste.

Water

Clothing is related to water in many ways. First, clothing production requires an enormous amount of water, and water is also misappropriated and inappropriately used.[137] Second, if not properly taken care of, the water used in the manufacturing process is an environmental hazard as contamination of water is a significant problem.[138] Third, washing clothing during use also requires water. Additionally, the entry of microplastics into water systems is an increasing problem.[139]

Chemicals

Textiles are chemical-intensive, and outdoor clothing requires different finishes that can potentially be hazardous for the environment and users. Concerns have been expressed regarding the potential for fluorocarbon water repellent treatments to be hazardous to the environment and health of humans.[140] In addition to the use of harmful chemicals in the production of clothing, the use of harmful pesticides and herbicides in the cultivation of natural fibers also presents a challenge.[141]

Asset stripping

Asset stripping means using non-renewable resources that also entail energy sources.[142] During the growing process, the natural fibers can affect the ground. Because different raw materials require different amounts of chemicals and land

137 Sherburne, 2009, 6
138 Sherburne, 2009, 6
139 Dalla Fontana et al., 2021
140 Schellenberger et al., 2019
141 Sherburne, 2009, 6
142 Sherburne, 2009

use, sustainability comes into consideration. Conversely, synthetic fibers present a problem regarding biodegradability.[143]

Transportation

All the clothing production requires transportation, and globalization has increased the transportation distances.[144] Both the state of the environment and the rate at which climate change is advancing are significantly influenced by the mode of transportation, and climate change, in turn, has an influence on the modes of transportation that are available.[145]

Offices and retail stores

Many outdoor brands have offices and retail stores, for which environmental responsibility must also be considered. Different environmental programs exist for offices. One is the WWF Green Office program, which helps build an environmental management system for offices. This system helps discover harmful environmental impacts and assesses the office's carbon footprint. The program's benefit is to generate specific objectives and directions to achieve these objectives. The WWF Green Office certificate can be used for communicating the actions to be taken. Many factors that need to be considered in offices also apply to retail stores, but some specific issues concern these shops, such as lighting and display materials. Energy usage is critical, and renewable energy is considered environmentally safe.[146]

Waste

Clothing production causes two types of waste: the waste that cannot be directly used and leftover fabric. The clothing also has an end of life, when it turns into waste that must be solved. Many different approaches exist to deal with waste, beginning with reusing and progressing to recycling or composting.[147] The material cycle should preferably be closed-loop, as this will reduce the amount of new raw materials needed.[148] The next section concentrates on the social challenges of clothing production.

2.2.3 Social challenges

The clothing and sportswear industries are famous for various worker's rights violations, with factory deaths being the worst. In 2014, Manzenreiter listed social challenges to the workplace, including sanitation and safety, freedom of association

143 Egan & Salmon, 2022
144 Sherburne, 2009, 6
145 Drucker et al., 2002
146 World Wildlife Fund, 2022
147 Harmsen et al., 2021
148 Wiedemann et al., 2022

denial, excessive working hours, lack of living wage, piecemeal work, and unstable employment.[149]

In 2016, Huq, Chowdhury, and Klassen created a framework for social management capabilities influenced by stakeholder pressure. They divided these capabilities into *monitoring, including buyer's auditing and supplier's compliance; collaboration; and innovation.* Additionally, social performance can be divided into *external* and *internal social performance*.

External social performance assists the local community and can include sanitation, food, shelter, and greater access to knowledge. Thus, it decreases the likelihood of social failures, such as job loss and exclusion of underprivileged stakeholders. Conversely, *health and safety*, including *deaths* and *emergency preparedness*, *occupational diseases*, *working environments*, and *worker wellness*, are internal social performance variables. These internal social performance elements also include *workers' quality of life*, such as *stress*, *overtime*, *work hours*, *minimum pay*, and *job satisfaction*, and worker rights, such as the prohibition of *forced labor*, *freedom of association*, *humane treatment*, *paid maternity leave*, *paid sick leave*, and *training*.[150]

In 2016, Posner argued that collaboration is crucial for setting benchmarks and industry standards; individual companies cannot set these standards alone.[151] International conventions exist, such as the Universal Declaration of Human Rights, the Convention on the Rights of the Child, the Children's Rights and Business Principles, UN Guiding Principles for Business and Human Rights, and OECD Guidelines.[152] The UN Global Compact and International Labor Organization (ILO) also publishes conventions, reports, and recommendations.[153]

According to the Universal Declaration of Human Rights, which was published in 1948, human rights are equal to all in all nations.[154] The convention on the Rights of the Child concentrates on human rights for those under 18 years old and aims to protect children from any discrimination.[155] Children's Rights and Business Principles suggest how companies can decrease their harmful effects on children.[156] The UN Guiding Principles for Business and Human Rights is a guiding report to protect human rights in companies.[157] Finally, the OECD Guidelines address human

149 Manzenreiter, 2014
150 Huq et al., 2016, 24
151 Posner, 2016, 710
152 OECD Watch, 2022; Unicef, 2022b, 2022a; United Nations, 2022; United Nations Human Rights, 2011
153 International Labor Organization, 2022; United Nations Global Compact, 2022
154 United Nations, 2022
155 Unicef, 2022b
156 Unicef, 2022a
157 United Nations Human Rights, 2011

rights, labor rights, and environment protection.[158] One of the most well-known social responsibility NGOs is Dutch Clean Clothes Campaign. Clean Clothes Campaign claims that lack of transparency is the central issue. According to the Clean Clothes Campaign, brands distance themselves from suppliers' workers and do not take full responsibility for those workers' rights, thus affecting the workers' right to organize and receive fair payment.[159]

2.3 Environmental responsibility

This section discusses several factors of responsibility. In this context, the term *responsibility* refers to the environmental consequences of the clothing supply chain. This section provides a detailed overview of environmental responsibility by introducing its various components. Examples of environmental responsibility include the use of chemicals, the disposal of waste, and animal rights. The garment life cycle consists of several stages; raw material production, textile manufacturing, actual apparel production, garment use, and end-of-life solutions. All these stages have environmental repercussions, which are described in this section. In addition, this section presents alternative ways to achieve the same outcome. The section aims to illustrate the complexity of environmental responsibility within the outdoor clothing industry.

2.3.1 Materials

Clothing is made from fabric, which can be referred to as the basic building block of apparel.[160] All fabrics have several influences on the environment.[161] This section aims to provide an overall picture of some issues concerning textiles. In 2001, Wilson made an informatic chart about textile materials, processes, and products. Fabrics are made of yarns constructed from fibers using woven, knitted, or non-woven techniques. Fibers are categorized as natural and man-made fibers. Natural fibers are divided into animal, vegetable, and mineral fibers, and man-made fibers are divided into regenerated and synthetic fibers. Textile production has several applied processes, including preparatory processes, dyeing, printing, and finishing. In 2011, Wilson divided textile products into six categories, with apparel being one of them.[162]

Natural materials present different challenges than synthetic ones, and comparing distinct elements of sustainability is difficult. Another concern is animal welfare, which requires consideration of animal suffering. This section is structured into a

158 OECD Watch, 2022
159 Clean Clothes Campaign, 2020
160 Blair, 2007
161 Sherburne, 2009, 6
162 Wilson, 2001, 4-5

discussion of materials, finishes, and testing, and it introduces the issues associated with each topic. Since sustainability is not a fixed objective, as best-practice knowledge is always evolving, this section offers a summary of current well-known concerns.

Natural fibers

This section begins with natural fibers because they are the oldest source of textile materials. Natural fibers are made of materials from plants, animals, or minerals. A more specific division of natural fibers is made according to the part of the plant in which the fiber is situated.[163] Natural fibers have several advantages; they are absorbent and strong, and they are pleasant to use. They are not toxic and do not cause toxic gases when burnt, and they are biodegradable.[164]

The most commonly used natural fiber is cotton.[165] However, in 2002, Talvenmaa argued that growing cotton causes different environmental hazards. The environmental effects of cotton can be divided into the growing stage and the processing stage.[166] The biggest problems in the growing stage are artificial watering, fertilizer, herbicides, and pesticides.[167] In the production stage, for example, chemicals used for bleaching, dyeing, washing, and finishing cause environmental impacts.[168] According to Smith, Ozturk, and Frey, "*wrinkle recovery*, *flame retardancy*, *anti-microbial behavior*, and *water repellency*" are some of the finishes used for cotton.[169] Therefore, conventional cotton apparel production has several environmental and social risks when pesticides affect air, water, soil, and people's health.

Bast fibers, flax, and hemp have been used for textile fibers for a long time and were substituted for other alternatives over the last century. They are again gaining interest for sustainability reasons.[170] Other natural fibers that have gained increasing attention due to environmental awareness are bamboo and soybean protein fiber.[171] Organic materials are natural materials grown and processed without toxic chemicals. Some organically produced plant fibers are cotton, hemp, and flax. Additionally, animal fibers, such as wool and silk, can be produced organically. Traditionally, the severe disadvantage of growing natural fibers is the use of pesticides, but natural fiber can be produced organically. Organic farming practices aim to maintain soil fertility and the ecological balance of natural systems.[172]

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163 Boncamper, 2004
164 Liu et al., 2012, 1477; Oliveira Duarte et al., 2019, 6
165 Mellick et al., 1, 2021; Wakelyn, 2009, 231
166 Kazan et al., 2020, 851
167 Talvenmaa, 2002
168 Kazan et al., 2020, 852
169 Smith et al., 2021, 4486
170 Manian et al., 2021, 8276
171 Liu et al., 2012; Sanches et al., 2015
172 Wakelyn, 2009, 232

One of the standards for organic materials is the Global Organic Textile Standard (GOTS). The GOTS established its certification system in 2006, and this system includes ecological and social parameters that must be followed to achieve the standard.[173] Toxic, persistent pesticides and synthetic fertilizers affect the soil. Thus, GOTS regulates how fibers are grown, as well as the environmental impact of processing.[174] Organic fabric production has various benefits. First, no chemical pesticides, herbicides, or chemicals are used to grow organic fibers. Therefore, these chemicals do not unintentionally enter the environment, and neither people nor animals are harmed. In addition, organic farming produces fewer CO_2 emissions and requires less water. Outdoor clothing brands use natural fibers mostly in their casual wear and base layers. Merino wool is currently a topical material; animal welfare issues are presented separately later in this chapter.

Man-made fibers

Man-made fibers are divided into synthetic and regenerated fibers.[175] Synthetic fibers are made by a chemical reaction called polymerization using coal, oil, or natural gas derivatives. Regenerated fibers cannot be used in their original form but must be processed into fibers.[176] Viscose is an example of a regenerated fiber.[177] However, the viscose manufacturing process is not environmentally friendly; Lyocell fibers are a more sustainable alternative.[178] Man-made fabrics have several advantages. They are often more durable and have more strength and resistance than natural fibers, and they dry more quickly and can be made water-resistant. Synthetic fibers can also be made stretchy. All these qualities are convenient for outdoor clothing.[179]

A great variety of synthetic materials exists, and more are invented continually.[180] One of the most commonly used synthetic fibers is polyester. Polyester can wick moisture from the skin and evaporate it into the air. Additionally, polyester is breathable and lightweight. However, polyester is made of crude oil, which is a non-renewable raw material, and its production has several environmental problems.[181] Although synthetic fibers have significant advantages, they also pose serious disadvantages. The use of nonrenewable raw materials and the elimination of synthetic materials are the primary issues.[182] Furthermore, if synthetic fibers are

173 Diekel et al., 2021, 7
174 Global Organic Textile Standard, 2022
175 Wilson, 2001, 4
176 Blair, 2007, 62
177 Wilson, 2001, 4
178 Moriam et al., 2021, 9549
179 Moriam et al., 2021, 9548; Talvenmaa, 2002, 24
180 Blair, 2007, 62
181 Palacios-Mateo et al., 2021, 3
182 Talvenmaa, 2002, 26

burnt, they can release poisonous gases,[183] and if they end up in landfills, they take a long time to degenerate because they are not biodegradable.

One significant problem with synthetic fibers is microplastics and microplastic release into the environment.[184] Microplastics are *"plastic particles with dimensions of less than 5 mm, including micrometric and sub-micrometric particles."*[185] The mechanisms of microfibers' harmful effects are poorly understood, but it is known that they create physical, chemical, and biological impacts.[186] Using, wearing, washing, and disposing synthetic textiles all release microplastics into the environment and the ocean.[187] In 2021, Vassilenko, Watkins, and Chastain et al. researched the effects of washing and the lint trap on microplastic release and found varying results depending on the trap and fiber type.[188] Microplastics are consumed by plankton, fish, large mammals, and humans. Although existing research has investigated inhaling and ingesting microfibers, their impacts on human health are difficult to research, and the effects are not yet fully known.[189] The outdoor clothing industry uses many man-made fibers in various products. Therefore, the problematic end of use is a significant issue, which will be discussed separately.

Chemical management and the restricted substance list

Users may be exposed to hazardous chemicals in textiles in two ways. The most likely is through skin contact, and the second is inhalation. Legislation and voluntary standards can reduce the danger of exposure to hazardous chemicals. In 2020, Roos et al. categorized chemicals used in textiles into three categories: *product function chemicals*, *process function chemicals*, and *background level contamination chemicals*. The first category of chemicals is used to attain the desired outcome and function in ready garments, while the second category is needed in the production process. Safe manufacturing practices should avoid the final group of chemicals.[190]

In 2019, Roos et al. created four parameters for chemicals. The first parameter is the input chemical that goes into the product, and the second parameter is the chemicals intended to remain in the product. The third parameter is direct process emissions to air, and the fourth parameter is direct process emissions to water.[191] The restricted substance list is used to inform textile manufacturers of prohibited

183 Talvenmaa, 2002, 68
184 Ramasamy et al., 2021, 41596
185 Dalla Fontana et al., 2021, 1
186 Henry et al., 2019, 487-488
187 Ramasamy et al., 2021, 457
188 Vassilenko et al., 2021, 12
189 Henry et al., 2019, 488-489
190 Roos et al., 2020, 4
191 Roos et al., 2019, 841

chemicals. Brands can create their own restricted substance list, or the list can include legal requirements, such as those of REACH, as well as voluntary commitments the brand wants to make. REACH (EC 1907/2006) is an EU regulation concerning the registration, evaluation, authorization, and restriction of chemicals.[192] It has a detailed mission: it *"aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances."*[193]

The complexity of supply chains causes challenges for regulating and managing chemical risks. Additionally, the complexity may provide brands excuses for not investigating or understanding their chemical use.[194] In 2015, Gauthier, Fung, and Panko argued that companies should have trained staff to perform chemical assessments. In other cases, these companies should rely on schemes to perform these assessments.[195] In 2020, Roos et al. stated that a lack of transparency in supply chains and knowledge increases the difficulty of chemical management.[196] Some examples of voluntary schemes of chemicals' restriction are Oeko-Tex and bluesign®; these will be presented later.

Dyes and finishes

Dyeing is one stage of the long supply chain of apparel, and textile dyes are an example of chemical use. Most modern fabrics are dyed for aesthetic and functional reasons, as color is a significant factor in the attractiveness of clothing.[197] Wilson provided a detailed description of the dyeing process: *"Dyeing is a chemical process which involves the migration of the dye from the dye solution to the surface of the fibres in the fabric being coloured, the diffusion of the dye through the fibres and the fixing of the dye by chemical bonding."*[198] Dyestuff can be divided into natural and synthetic dyes.[199] According to Easton, textile dyeing requires different chemicals and auxiliaries. The auxiliaries, such as dispersing agents, buffers, and dedusting agents, are either involved in the dyestuff or added during the dyeing process and finally end up in the dyehouse's emissions.[200]

Different wastewater treatments, including physical, chemical and biological treatments or a hybrid of these treatments and absorbents, aim to remove textile dyes from the water.[201] If wastewater from the dyeing process is inappropriately treated

192 Gauthier et al., 2015, 242
193 European Comission, 2022
194 Boström et al., 2012, 108
195 Gauthier et al., 2015
196 Roos et al., 2020, 1
197 Hynes et al., 2020, 2
198 Wilson, 2001
199 Hynes et al., 2020, 4
200 Easton, 2009
201 Hynes et al., 2020, 5

and released into the environment, it can cause various environmental problems to aquatic ecosystems.[202] Solving this problem requires innovations. In 2009, Easton stated that the textile wet-processing industry, of which dyeing is part, must have new products, processes, and machinery to solve its problems,[203] such as low-energy dyeing processes, which can include enzyme activation or biomimetic systems, and low-water dyeing and printing processes.[204]

Per- and polyfluorinated chemicals

Per- and poly-fluoroalkyl substances (PFAS) are used in outdoor clothing for water and dirt resistance, but they are known to have hazardous impacts on the environment and human bodies.[205] Although they are various, PFAS can be roughly divided into long and short-chain chemicals. In 2011, Buck et al. wrote an extensive article about per- and polyfluoroalkyl substances and their correct classification and terminology, highlighting the complexity of the different chemical families.[206]

PFCs are environmentally hazardous substances that are persistent in nature. As a result, they can be found in the environment, wildlife, and humans. PFAS spread around the globe, even to remote areas.[207] Additionally, PFCs may harm human health in several ways, for example, by affecting the hormone system and causing tumor growth.[208] PFCs are released into the environment in two ways, either during the manufacturing process or during the use or disposal of products that contain PFCs. One step was to change long-chain PFCs to short-chain PFCs, but larger quantities of short-chain PFCs are needed for the same performance. The outdoor clothing industry is aware of this problem and is trying to find alternative solutions.

In 2019, Cousins et al. published research on per- and polyfluorinated chemicals in the outdoor industry.[209] In 2012, Greenpeace targeted the outdoor industry due to the outdoor industry's environmentally friendly image and to PFAS chemistry.[210] Both Greenpeace and researchers, Cousins et al., claimed that Greenpeace's Detox Campaign, which targeted the outdoor industry, impacted the outdoor brands. Although short-chain PFAS are still used, other alternatives are being researched.[211] Zero Discharge of Hazardous Chemicals (ZDHC) was founded in 2011 in response

202 Premaratne et al., 2021, 1
203 Easton, 2009, 148
204 Easton, 2009, 151
205 Cousins et al., 2019, 2
206 Buck et al., 2011, 513
207 Buck et al., 2011
208 Steenland et al., 2010
209 Cousins et al., 2019
210 Greenpeace, 2017
211 Cousins et al., 2019; Greenpeace, 2017

to Greenpeace's Detox Campaign. It aimed to offer guidelines, platforms, and solutions for chemicals for the textile, apparel, and footwear industry. The ZDHC Roadmap to Zero Program aims to identify and replace hazardous chemicals in production and evaluate and assess wastewater and emissions.[212]

Nanotechnology in textiles

Nanotechnology in textiles is a growing industry. According to Black, nanotechnology is an umbrella term for various types of molecular and atomic scale technologies. Nanotechnology is used to describe materials with a length of 1–100 nanometers.[213] In 2020, Bai et al. defined nanotechnology as follows: *"Nanotechnology, also now referred to as molecular nanotechnology, is the particular technology to control individual atoms and molecules for fabrication of macroscale products."*[214] Nanotechnology can be used to create desirable properties, including high tensile strength, a unique surface structure, a soft feeling, water and oil resistance, fire retardance, antimicrobial properties, UV blockage, wrinkle-resistance, and self-cleaning properties.[215] These new technologies are also called "added-value technologies" because they bring new properties to textiles.[216]

For example, silver nanoparticles added to clothing due to their ability to kill bacteria and fungi. Additionally, they prevent nasty odors, which is essential in activewear. Another example is silica, which is used for water and stain resistance. Titanium dioxide and zinc oxide are used for sun blocking. Research on the possibilities of nanotechnology in textiles is wide-ranging; each technology and end-use requires different research. For example, Horrocks researched plasma technology in nano-coatings for flame retardancy in 2011, while Cai et al. researched nanocomposite textiles for personal cooling in 2018.[217]

Clothes with nanotechnology are often made from standard fabric to which nanocoating is applied. In the future, fabrics may be made from nanofibers. However, nanoparticles might be released into sweat or during washing, and these released particles could end up in the water, where they would be dangerous to aquatic life. Information on nanoparticles and their effects is still lacking. In 2022, Shah et al. demanded that environmental controls are needed for nanotechnology; it cannot follow the case of microplastics, which were applied without controls.[218]

212 Greenpeace, 2018; Zero Discharge of Hazardous Chemicals, 2020
213 Black, 2009, 304
214 Bai et al., 2020
215 Shah et al., 2022, 15; Andra et al., 2021, 1355
216 Broasca et al., 2013, 272
217 Cai et al., 2018; Horrocks, 2011
218 Shah et al., 2022, 15

Anti-odor treatments

Outdoor clothing is often needed in physical activity, and anti-odor treatments are thus sometimes used in this clothing (mainly in base layers). On its own, sweat is odorless, but when it reacts with the bacteria on the skin, it begins to smell. Various fibers differ in terms of odor issues, with natural fibers naturally tending to have fewer odor intensities.[219] However, more environmentally friendly laundering systems and the increased use of synthetic materials have increased odor and stain problems, creating interest in solving this challenge. Previously, antimicrobial finishes were used in apparel, but the modern solution to odor is encapsulated nanoparticles.[220]

Anti-odor technology aims to block or kill bacteria before interacting with sweat, and different solutions for anti-odor fabrics exist.[221] Some solutions include chemically treated antimicrobial fabrics, fabrics woven or treated with silver, and volcanic ash-treated fabrics. According to Andra et al., metal nanoparticles, such as gold, silver, and copper, exhibit antimicrobial activity in textiles.[222] Additionally, oxide nanoparticles, such as titanium, zinc, magnesium, copper, and iron, can be used in textiles.[223]

Silver nanoparticles (AgNP) are antibacterial, antiviral, antifungal, and anti-inflammatory, properties that give them a variety of end-use possibilities. In 2018, Li et al. confirmed that nano silver has not only antibacterial but also UV protection properties.[224] However, what happens during the washing and disposal of the products is not fully known.[225] Laundering durability is essential for nanoparticle-treated textiles, and it has been increasingly researched.[226] Another supposed disadvantage is the safety of these chemicals and the possibility that these fabrics also kill the body's microbiome, which are its necessary beneficial bacteria. In 2016, Klepp et al. concluded that odor is a social problem that should not be solved with more serious environmental and health problems.[227]

Mosquito proof fabrics

Outdoor clothing is specifically used outdoors, where mosquitos can be a problem. As a result, the demand for mosquito-proof fabrics is growing.[228] While mosquitos

219 Klepp et al., 2016, 311-312
220 Broadhead et al., 2021, 15-16
221 Amna et al., 2021, 2586
222 Andra et al., 2021, 1362
223 Andra et al., 2021, 1366
224 Li et al., 2018, 424
225 León-Silva et al., 2016, 14-15
226 Andra et al., 2021, 1376
227 Klepp et al., 2016, 312-313
228 Koo, 2018, 230

are annoying, more significantly, they spread diseases.[229] Due to global warming, mosquito-spread diseases are increasing, and more people die from mosquito-borne infectious diseases than before, which has increased the interest in personal protection against mosquitos.[230]

Mosquitos are attracted to humans by smell, exhaled carbon dioxide, body odors, and body temperature. One way to prevent mosquitos is to spread repellent on clothing, and variety of repellents exist. Insecticidal fabric is a term for fabrics that are treated against insects.[231] The application method can be spraying the fabric, microencapsulation, or a sol-gel technique for insect-repellent agents, such as permethrin.[232] In 2018, Gopalakrishnan et al. stated that insecticidal fabrics are used worldwide but the varying residue analysis, bio-efficacy, and wash testing techniques prevent comparison of different mosquito-proof apparel.[233]

In 2013, Debboun and Strickman identified two downsides of treated clothing. First, this apparel do not provide protection at night time, because people do not sleep in the clothing. Second, the clothing does not protect exposed skin. However, they claimed that more studies about treated clothing are required.[234] Three different methods are involved in producing mosquito-repellent fabric. Natural, organic methods include cedarwood, lavender, peppermint, ester plant, neem, and lemongrass oil. Chemical methods include DEET and Permethrin, while physical methods are mosquito nets or traps.[235] The disadvantage of synthetic mosquito repellents, such as Permethrin and DEET, is that they are potentially harmful to human health. Thus, alternatives have been researched.[236] For example, in 2012, Luan et al. examined non-insecticidal textiles designed with a structure that may prevent harmful chemical use in the future.[237]

UV protection fabrics

Outdoor clothing is self-evidently used outdoors where there is a danger of UV (ultraviolet) radiation.[238] As knowledge about UV exposures has increased, so has the demand for UV protection. Furthermore, ozone depletion causes increased ultraviolet radiation.[239] Ultraviolet protection factor (UPF) indicates the amount of UV radiation, including UVB and UVA, that a fabric allows to reach the skin. The

229 Anuar & Yusof, 2016, 1
230 Xu et al., 2021, 890
231 Gopalakrishnan et al., 2018, 3067
232 Holme, 2007, 68; Ardanuy et al. 2014, 132
233 Gopalakrishnan et al., 2018, 3078
234 Debboun & Strickman, 2013, 6
235 Debboun & Strickman, 2013, 2; Holme, 2007, 68; Khanna & Chakraborty, 2018, 17
236 Luan et al., 2021, 2; Chatha et al., 2019, 679
237 Luan et al., 2021, 23
238 Broasca et al., 2013, 272
239 Kocić et al., 2019, 1229; Ghamsari et al., 2017, 207

higher the UPF rating, the more the fabric protects the skin from UV radiation. The Skin Cancer Foundation has rated fabrics with UPF over 30 as qualifying for good protection.

UV protection of textile materials depends on many factors, for example, fiber type (i.e., natural or man-made fiber), fabric construction (e.g., porosity, weight, thickness, and dyestuff), and color effect.[240] For example, tightly woven fabrics better block UV radiation. UV protection can be increased by using UV absorbers in the dyeing process, and natural dyes can be used for UV protection.[241] According to Broasca et al., various methods exist to improve textiles' UV resistance, such as natural zeolites, nanoparticles, titanium dioxide, and zinc oxide, which are metal oxide nanoparticles.[242] In 2022, Fernandes et al. noted that metal nanoparticles (MNPs) require polysaccharides, such as chitosan, alginate, starch, cyclodextrins, and cellulose, to improve their function and washing fastness.[243]

In 2018, Subramani et al. researched the UV-blocking properties of herbal nanoparticles made from aloe vera and found that it improves UV protection.[244] In 2019, Kocić et al. found that water, energy, and chemical use are reduced when avoiding dyeing and chemical treatments and instead creating UV protective properties with textile construction.[245]

Testing

The number of tests available for textiles and finished garments has also expanded with increased availability of technological textiles. These include physical, mechanical, chemical, physiological, and intelligence testing, as well as visual examination of textiles.[246] Testing ensures the quality and safety of products for consumers as well as their environmental friendliness. For example, the durability of clothing directly affects the life span of the clothing. Some examples of functionality tests are wet abrasion, water repellency, water resistance, moisture management and wicking, drying rate, air permeability, breathability, UV protection, antimicrobial efficacy, stretch and recovery, thermal resistance, and burst resistance. Other tests are related to durability, such as tear-strength and pilling or colorfastness. Woodhead Publishing Limited published a book edited by Hu on fabric testing in 2008.[247] ISO is not only an international standards organization with standards for textile and clothing functionality testing, but it also has standards concerning responsible

240 Grifoni et al., 2009, 313
241 Rather et al., 2019, 8
242 Broasca et al., 2013, 272-273
243 Fernandes et al., 2022, 1, 23
244 Subramani et al., 2018, 424
245 Kocić et al., 2019, 1235
246 Hu, 2008, 5
247 Hu, 2008

production. ISO 14000 is an environmental management series of standards.[248]

When clothing is ready, outdoor companies conduct usability testing in a real-life environment. These are called field tests and are often performed by pro athletes and ambassadors for outdoor clothing brands. The ambassadors are not necessarily famous, but they use the gear and write about it on blogs and social media. These ambassadors can affect consumers' sustainability awareness and outdoor clothing choices. In 2019, Michel et al. conducted a study examining the experiences of Patagonia's customers with the company's products.[249]

2.3.2 Animal welfare

Because of animal fibers'superior performance, the outdoor apparel industry makes full use of materials derived from animals, including down and merino wool. Down is an excellent and lightweight insulator that is convenient for outdoor clothing. However, ducks and geese have faced horrible treatment because of the use of down. One method of retrieving down is live-plucking from alive birds, and another issue is force-feeding the geese.[250] Several down standards are used to monitor the supply chain and prohibit live-plucking and force-feeding. The Responsible Down Standard (RDS) is an industry standard to ensure holistic welfare and an ethical down supply chain without live-plucking or force-feeding.[251]

Another commonly used material is merino wool. Merino wool has properties that are suitable for outdoor clothing. Merino wool is soft, temperature-regulating, repellant of water and dirt, anti-static, pill free, and odor resistant. However, Merino sheep attract flies, and mulesing is used to prevent it. In mulesing, the skin is removed from the rear of the Merino lamb without anesthesia to avoid flystrike.[252] In 2021, Hancock et al. concluded that mulesing should be avoided until effective pain-relief treatments are invented.[253]

FOUR PAWS is a global animal welfare organization that aims to protect animals from human cruelty. In 2022, FOUR PAWS published a report about merino wool and mulesing in the sportswear industry, stating that these cruel practices harm the welfare of animals and should be avoided. They proposed that one solution is breeding sheep that do not have the same folded skin as merino sheep.[254] Another animal rights organization, People for the Ethical Treatment of Animals (PETA), also works to ban mulesing sheep, as well as live-plucking and force-feeding geese.

248 ISO Standards, 2022
249 Michel et al., 2019
250 Kozák et al., 2010
251 Textile Exchange, 2022
252 Lee & Fisher, 2007
253 Hancock et al., 2021
254 FOUR PAWS, 2022

2.3.3 Use

Several characteristics of sustainability are present throughout the use phase of clothing as users' behaviors can have a substantial impact on environmental sustainability. This section discusses users' ability to influence a garment's life span.

Care and repair

The user has a great responsibility for maintaining and repairing outdoor clothing. Because outdoor clothing is often exposed to dirt, the garment's washing is essential as dirt destroys the fabric over the long term. Washing in the correct temperatures is also crucial because incorrect washing can ruin the garment's functionality. The best place to store outdoor clothing is in a cool and dry area without extreme heat or cold.

Outdoor clothing can have water repellency treatments that can be renewed. Another dimension is the garment's repair; many outdoor brands provide a warranty for their clothing and repair broken clothing for free. They also may provide a repair service in which users can have their gear repaired for a fee. The careful care and repair of outdoor clothing can extend its lifespan. Another way to expand the garment's life cycle is to buy quality products, as high-quality clothing lasts longer and maintains its shape. Additionally, outdoor stores are good sources of care information, and maintenance directions should be reviewed when purchasing the product.[255]

As previously mentioned, Michel et al. conducted a qualitative case study in 2019 about the motivation of users to repair and extend Patagonia apparel's life span and increase its sustainability. To do so, they investigated Patagonia's Stories We Wear blog posts from 2015–2017.[256] They identified six themes and several subthemes. These central themes were (reasons for) *keeping the garment, imagining the future* (with the garment), (reasons for) *fixing the garment*, describing *physical characteristics*, *thanking* Patagonia (for excellent garment properties), and *traveling and having adventures* (with the garment).[257]

The keeping the garment theme was divided into passing it on as a legacy, practicing sustainability, being emotionally attached to the garment, belonging to a group, making a turning point, the garment's serving as a memento, choosing long-lasting quality, and purchasing the garment as an investment. Describing the physical characteristics theme was divided into humanizing the garment and showing wear and tear. Finally, the traveling and having an adventure theme was divided into describing adventures with the garment, stating the adventure's location, and expressing the need to escape or connect with nature.[258] Michel et al. concluded that

255 Seppälä, 2010
256 Michel et al., 2019, 165
257 Michel et al., 2019, 171
258 Michel et al., 2019, 171

love for the Patagonia brand was extended to the level of the product and that other brands could learn from Patagonia's example of improving sustainability in the use stage of the apparel life cycle.[259]

Use-oriented product-service systems

A relatively new business model called use-oriented product-service systems (u-PSS) is renting consumer goods and, in this case, outdoor clothing. In this model, the business is based not on owning the product but on providing access to using the product through renting, leasing, or some similar approach.[260] One of the benefits of rental systems is that the service provider performs the laundry and repair services, thus ensuring the clothing is in good condition for the following user.[261]

Borg, Mont, and Schoonover identified both barriers and drivers for consumers' adoption of use-oriented product-service systems. Some of the obstacles included hygiene concerns, difficulty understanding terms, and the value compared to product ownership.[262] They found that people have a desire to own their products.[263] However, they also identified four u-PSS drivers: financial, functional, emotional, and social value drivers. For instance, monetary value may stem from the opportunity to switch products and maintenance services. The ability to alter items might be considered a functional value. The service provider's obligation to handle the product's end of life was another functional value. Emotional drivers indicate that using a new service is enjoyable, and environmental consciousness is likewise an emotional driver. Finally, social value as a driver included sustainability, which many viewed as a societal requirement. According to Borg, Mont, and Schoonover, sustainability is an additional value for customers but a requirement for businesses.[264]

2.3.4 End of use

The user can be finished with outdoor clothing for many reasons. One scenario is that the clothing is still usable but the user does not want it anymore for reasons ranging from poor fit to boredom with the product. Many outdoor brands already have second-hand gear programs, and reuse is the best alternative when clothing is still usable.[265] As discussed in the previous section, rentals are an option that have only existed for a short time. The consumer has the option to rent the outdoor apparel for a predetermined amount of time and is not required to buy the product

259 Michel et al., 2019, 177
260 Borg et al., 2020, 1
261 Borg et al., 2020, 10
262 Borg et al., 2020, 11
263 Borg et al., 2020, 12
264 Borg et al., 2020, 12-13
265 Stanescu, 2021, 14265

if it is being rented for a single event. This is one of the benefits of rentals, as well as the opportunity to try on a selection of appropriate apparel.

The final scenario is that the clothing is not usable anymore. In 2021, Stanescu stated that disposal of products is a significant environmental problem; therefore, post-consumer waste must be addressed.[266] According to Egan and Salmon, linear and circular textile disposal processes exist. First, a garment can possibly be reused either by up- or downcycling. Garments' disposal in the environment, incineration, or landfill represents linear processes, while those in compost and biogas represent circular processes.[267] In 2021, Hemantha claimed that sustainability requires raw materials to be recycled. Both natural and synthetic materials can be recycled using different methods, and the efficiency of recycling depends on the energy used during the process. Recycling synthetic materials has a significant advantage in terms of emissions compared to the production of virgin materials.[268] The two major recycling technologies are mechanical and chemical recycling.[269]

Textile recycling is multi-dimensional. One dimension is companies' motivation to use post-consumer-recycled material in their products, and another is companies' motivation to organize recycling possibilities for their consumers. Other dimensions are consumers' willingness to recycle their own clothing and to buy clothing made of recycled material. Both of these dimensions have been researched. One possible barrier to companies' motivation for textile recycling is consumers' perceptions; consumers still must be convinced that "recycled" is not a synonym for low-quality.[270] According to Norris, some people perceive used clothing and recycled material as dirty and contagious.[271] In 2019, Childs, Woo, and Kim investigated consumers' interpretations of clothing companies' CSR campaigns. They concluded that consumers' perception of in-store recycling opportunities and their effect on brand image are unknown.[272]

One alternative for garment disposal is biodegradation, which is possible for natural fibers. Egan and Salmon studied the biodegradability of synthetic fibers and found that conventional synthetic fibers, such as polyethylene terephthalate (PET), nylon, and acrylic, are not biodegradable, whereas new synthetic fibers, such as PLA in the correct blend, can.[273] However, significant challenges are faced by both textile recycling and garment biodegradation. For example, outdoor garments typically have different fiber blends, accessories, laminates, dyes, and finishes that complicate

266 Stanescu, 2021, 14253
267 Egan & Salmon, 2022, 3
268 Hemantha Y, 2021, 36
269 Norris, 2019, 889
270 Harmsen et al., 2021, 14
271 Norris, 2019, 886
272 Childs et al., 2019, 490
273 Egan & Salmon, 2022

the process. However, different fiber separation methods are being researched and innovated.[274]

Another form of waste is leftover fabric before clothing production, which is referred to as pre-consumer waste. This leftover fabric is sometimes called *deadstock*. Other names are overstock, surplus fabric, and remnant. This fabric is leftover for many reasons. For example, the brands might order too much fabric and not use it. Alternatively, the fabric mill might make mistakes, such as producing incorrect colors. Another reason could be that the fabric order was canceled too late. Leftover fabric can also remain after garment pieces are cut. Computer programs that plan the cutting can optimize this cutting of leftover fabric, and items can be designed and produced from leftover fabric.

In this section, I explored the concept of environmental responsibility from a variety of perspectives. The topic of social responsibility is presented in the next section. In many instances, these are connected to each other. As a result, many of the issues regarding environmental responsibility are related to health and safety and should also be addressed from the standpoint of human rights. A significant component of social responsibility is ensuring the well-being of the suppliers' workforce.

2.4 Social responsibility

In 2016, Huq, Chowdhury, and Klassen researched social responsibility in the clothing industry. They stated, *"Social sustainability can be broadly characterized in at least two ways: avoiding social failures with adverse impact, such as child labor or loss of life; and improving employee and community health and welfare."*[275] Social responsibility means protecting the welfare of people who are working in the supply chain. In 2015, Haque and Azmat identified eight dimensions of CSR: *"gender, realities, legal aspects, fair trade, fair pay, social welfare, work-life balance, labor rights, occupational health and safety, and environment."*[276]

Many clothing companies who use suppliers have adopted social criteria and a code of conduct,[277] and auditing of social responsibility practices has become more common.[278] Several social auditing frameworks exist, including Amfori Business Social Compliance Initiative (BSCI). Amfori BSCI was founded in 2003 and has 11 fundamental principles that are included in the BSCI code of conduct.[279] These

274 Jönsson et al., 2021, 4037
275 Huq et al., 2016, 20
276 Haque & Azmat, 2015, 179-180
277 Winter & Lasch, 2016, 184
278 Huq et al., 2016, 22
279 Qima, 2022

principles are based on International Labor Organization (ILO) conventions, the UN Charter of Human Rights, and other international labor declarations.[280] The 11 fundamental principles in the Amfori BSCI code of conduct provide an overarching picture of social responsibility. They are *"The rights of Freedom of Association and Collective Bargaining, No Discrimination, Fair Remuneration, Decent Working Hours, Occupational Health and Safety, No Child Labour, Special Protection for Young Workers, No Precarious Employment, No Bonded Labour, Protection of the Environment and Ethical Business Behaviour."*[281]

The Outdoor Industry Association has created several documents, including a model for a code of conduct, to help companies enhance their corporate social responsibility.[282] The OIA Code of Conduct Interactive Guide has listed various factors that must be considered when establishing and communicating about a CSR program. These themes are transparency, non-discrimination, harassment or abuse, recruitment and hiring, freedom of association, hours of work, compensation, health and safety, and community.[283]

Communication of social responsibility should be open and avoid presenting misleading information. OIA provides several suggestions for transparency. First, auditors should be able to access all parts of the factory and interview the employees. Transparency also prohibits bribery, unauthorized subcontracting, and falsified documents, such as double books. Additionally, management should not coach employees to answer in a certain way, and management should communicate the code of conduct to employees. Finally, payrolls should be accurate, and the factory should possess a business license.[284]

Many outdoor brands have the same suppliers. Therefore, OIA recommends brand collaboration as related to social responsibility. Collaboration can strengthen the responsibility demands and change factories' policies. OIA defines the term brand collaboration as follows: *"Brand collaboration is an industry term that refers to the collective effort among multiple players in the supply chain."*[285] The following sections describe some of the social responsibility issues more specifically.

2.4.1 Forced labor or human trafficking

Any form of labor that is not done voluntarily should not be tolerated. Workers should also be able to terminate their employment at any time. Human trafficking and modern slavery are issues that affect the clothing industry. The Amfori BSCI Code of conduct states that *"business partners shall not engage in any form of servitude,*

280 amfori BSCI, 2010
281 amfori BSCI, 2017
282 Outdoor Industry Association, 2014, 2022b, 2022a, 2022c
283 Outdoor Industry Association, 2022a
284 Outdoor Industry Association, 2022a
285 Outdoor Industry Association, 2014

forced, bonded, indentured, trafficked or non-voluntary labour."[286] OIA has created a Code of Conduct Sample that brands can use as a model for their documents. It states the following about the prohibition of forced labor: *"There shall be no use of forced labor, including prison labor, indentured labor, bonded labor, human trafficking, slavery or other forms of forced labor."*[287]

In 2014, LeBaron stated that the risk of slavery and forced labor in global supply chains is increasing. LeBaron used the term *"slavery-proof supply chains,"* claiming that nongovernmental organizations (NGOs) and the social audit industry are working toward achieving these chains. These voluntary organizations can be called voluntary corporate social responsibility (CSR) initiatives.[288] According to LeBaron, one phenomenon that is increasing the risk of slavery and forced labor is subcontracting. Although it is not illegal, it makes auditing practices more challenging.[289]

2.4.2 Child labor

Prohibiting child labor aims to protect children, and employers should confirm the age of their workers. In 2002, Kolk and Van Tulder researched the effect of companies' codes of conduct on child labor and found that they do have an effect but are not the only tool.[290] Business partners of Amfori BSCI are required to check workers' age in a respectful manner. One potential hazard is sex and drug trafficking, and the company is responsible for finding safe solutions for children.[291] Additionally, OIA agrees with BSCI about the plan for minor workers; according to OIA, child labor is partly a hiring issue. Therefore, the factory should maintain practices of confirming the legal age of their potential workers. The factory should also have a child labor remediation plan if they find underage employees in their factory.[292]

2.4.3 Wages and benefits

The work should offer a fair remuneration that covers decent living costs and is at least above poverty line. In 2006, Anker stated, *"A living wage is intended to enable workers to support themselves and their household at an acceptable standard of living."*[293] The living wage is a different amount around the world and differs by country, and different methodologies are used to estimate the living wage.[294] The

286 amfori BSCI, 2017, 7
287 Outdoor Industry Association, 2022b, 1
288 LeBaron, 2014, 237
289 LeBaron, 2014, 246
290 Kolk & van Tulder, 2002, 269
291 amfori BSCI, 2017
292 Outdoor Industry Association, 2022a, 30
293 Anker, 2006, 312
294 Anker, 2006, 335

Amfori BSCI Code of Conduct also states that wages should be paid in full and on time.[295] Furthermore, the OIA has identified many compensation-related factors. First, national laws must be adhered to, and a payment policy must be in place. For example, a minimum wage and a training wage are required. The factory should also provide overtime compensation based on the day of the week and holidays. Additionally, factories should provide social security benefits, such as pensions, legal benefits, and holiday pay. Also essential are prompt payment, correct compensation calculation, and pay statements.[296]

2.4.4 Working hours

Agreed-upon working times should not exceed the weekly hours set by ILO, and the use of overtime should be paid and voluntary for the worker. Furthermore, overtime cannot increase the likelihood of occupational hazards.[297] OIA provides numerous suggestions for work hours. First, factories should comply with national laws and regulations regarding working hours. Second, a written working time policy should be accessible to all employees, as well as records of actual working hours. Finally, regular work hours and overtime must be negotiated. Recommendations for working hours also include weekly working hours, a day off, lunch and rest breaks, holidays, and optional overtime. [298]

2.4.5 Freedom of association and collective bargaining

Employers should allow the formation unions and should *not discriminate against workers because of trade union membership*.[299] In 2017, Siegmann, Merk, and Knorringa studied trade unions that are present in the Indonesian sportswear industry. They discovered that it also required collaboration from brands in direct competition with each other since, for instance, public reports of union oppression against one company are damaging to the entire sportswear industry.[300]

2.4.6 Health and safety

Employers should follow occupational health and safety regulations. These include free personal protective equipment, access to sanitation, and clean drinking water.[301] The OIA has compiled a comprehensive set of recommendations related to health and safety, including general recommendations as well as recommendations for building and working conditions, fire safety, electrical safety, chemical management,

295 amfori BSCI, 2017, 5
296 Outdoor Industry Association, 2022a, 44-45
297 amfori BSCI, 2017, 5
298 Outdoor Industry Association, 2022a, 40-41
299 amfori BSCI, 2017, 4
300 Siegmann et al., 2017
301 amfori BSCI, 2017, 6

machine safety, protective equipment, accidents and injuries, and medical aid and auxiliary services.[302]

2.4.7 Discrimination, harassment, and abuse

The Amfori BSCI Code of Conduct prohibits all discrimination: *"Business partners shall not discriminate, exclude or have a certain preference for persons on the basis of gender, age, religion, race, caste, birth, social background, disability, ethnic and national origin, nationality, membership in unions or any other legitimated organizations, political affiliation or opinions, sexual orientation, family responsibilities, marital status, diseases or any other condition that could give rise to discrimination. In particular, workers shall not be harassed or disciplined on any of the grounds listed above."*

OIA's recommendations are similar to those of the BSCI. Discrimination based on race, religion, gender, color, age, disability, sexual orientation, nationality, political opinion, social group, ethnic origin, marital status, organization membership, or other personal characteristics should be prohibited.[303] One serious form of discrimination is gender discrimination; many garment workers are women, who often face harassment at work and on work trips. Social responsibility and environmental responsibility issues are often interlinked. For example, chemical management is an environmental responsibility issue and a health and safety issue for workers.[304]

Rarely can a single company tackle all these problems on its own. Therefore, a diverse range of opportunities for partnership exist. In the following two sections, some of the most important stakeholders and players in the outdoor apparel sector will be discussed. The first category consists of associations inside the industry, while the second consists of non-governmental organizations (NGOs), which include various standards and labels. These groups work to resolve a variety of responsibility issues and improve the industry's capacity for sustainability. The various parties involved in the outdoor industry are discussed in the following section.

2.5 Stakeholders in the outdoor industry

The stakeholders in the outdoor industry have been proactive in collaborating with each other. Two major collaboration associations exist: the European Outdoor Group in Europe and the Outdoor Industry Association in the United States. This section presents both of them, as well as the Sustainable Apparel Coalition. The Higg Index was developed by the Sustainable Apparel Coalition, a global nonprofit

302 Outdoor Industry Association, 2022a, 47
303 Outdoor Industry Association, 2022a, 23
304 Mezzadri, 2016

alliance that unites multiple stakeholders. These three stakeholders have a significant impact on the outdoor industry.

2.5.1 European Outdoor Group (EOG)

The European Outdoor Group (EOG) represents the outdoor sector to the European Commission, non-governmental organizations, and other stakeholders. The EOG has various purposes and tasks. First, the EOG organizes and supports trade shows and industry events and engages with politicians and legislators. Second, it supports environmental and social responsibility initiatives and conservation organizations. Third, the EOG undertakes market research and encourages European citizens to become active outdoors. The European Outdoor Group believes that three essential priorities must be in place for the brands to be successful. These priorities are conducting business properly, preserving the outdoors, and getting people outside [305]

Nineteen of the largest outdoor companies globally founded the European Outdoor Group in 2003, aiming to build a collaborative association to represent the outdoor sector in Europe. The EOG allows the brands, retailers, national associations, and technology providers to collaborate constructively.[306] The European Outdoor Group operates in various responsibility areas. It aims to create change globally. Sustainability actions may be considered essential for the outdoor industry and there are several benefits to doing them. Sustainability actions affect reputation, the efficiency of operations, and innovations. The EOG's vision is to ensure a global and profitable business. The organization benefits the industry as a whole, as well as people who go outdoors and use outdoor equipment and clothing.[307]

2.5.2 Outdoor Industry Association (OIA)

The Outdoor Industry Association (OIA) has several action areas. First, the OIA aims to help its members to conduct successful business and perform sustainable innovations. Second, it aims to affect trade policy and encourage outdoor activities.[308] The Outdoor Industry Association also promotes policies that benefit businesses and outdoor spaces. The OIA empowers outdoor companies to take action to achieve a positive impact, and through the Outdoor Foundation, they work to make the outdoors accessible for all people. The OIA also delivers education for people in the outdoor sector.[309]

Fourteen forerunner outdoor industry leaders created the Outdoor Industry Association in 1989. Their aim was to create a unified and collaborative association to help and instruct the industry. Currently, the OIA has more than 1200 members

305 European Outdoor Group, 2022a
306 European Outdoor Group, 2022c
307 European Outdoor Group, 2022b
308 Outdoor Industry Association, 2022a
309 Outdoor Industry Association, 2022b

in various fields of the industry.[310] The Outdoor Industry Association's mission is to serve as a member-driven trade association. Within its members, OIA may alter trade policy, develop new sustainable business solutions, and promote outdoor recreation.[311]

2.5.3 Sustainable Apparel Coalition (SAC)

The Sustainable Apparel Coalition (SAC) is a worldwide coalition for the textile and apparel sector that operates on a non-profit basis. Currently, members include retailers, suppliers, service providers, trade groups, non-profit organizations, NGOs, and academic institutions. Members also include apparel, footwear, and textile brands. All stakeholders have agreed to participate in the coalition as a result of the importance they place on social and environmental responsibility.[312]

The primary work of SAC is the Higg Index, a sustainability evaluation toolbox. The tools of the index can be used to measure and improve environmental and social responsibility in the supply chain and increase transparency using Higg Index data.[313] The SAC's vision is as follows: *"A global consumer goods industry that gives more than it takes—to the planet and its people."* The mission of the SAC is as follows: *"To transform business for exponential impact through groundbreaking tools, collaborative partnerships, and trusted leadership for industry sustainability."*[314]

The Higg Index was based on previous research. The Eco Index was produced by the Outdoor Industry Association and the European Outdoor Group. Nike independently developed their own sustainability metrics tool. The founding companies of SAC, who were originally competitors but desired to collaborate toward sustainability, convened their first meeting in 2010.[315]

2.6 Responsibility collaboration

A variety of different organizations and standards help outdoor brands become responsible. Many of them are membership organizations, and individual brands can belong to several organizations at the same time. Voluntary environmental product information schemes (EPIS) are different ecolabels that systematically approach the responsibility and sustainability information of products and are used to inform consumers.[316]

310 Outdoor Industry Association, 2022c
311 Outdoor Industry Association, 2022c
312 Sustainable Apparel Coaliation, 2022b
313 Sustainable Apparel Coaliation, 2022b
314 Sustainable Apparel Coaliation, 2022a
315 Sustainable Apparel Coaliation, 2022c
316 Diekel et al., 2021, 4

Brands need partners to collaborate because improving working conditions, controlling restricted chemicals, and increasing environmental and social responsibility transparency is difficult alone.[317] At times, the pressure of competition pressure drives companies to seek best practices and join alliances and networks.[318] This section presents some common alliances to which outdoor companies belong. These collaboration organizations are presented in alphabetical order.

2.6.1 Better Cotton Initiative (BCI)

The purpose of the Better Cotton Initiative (BCI) is to help small cotton farmers. Better Cotton delivers *the knowledge, support, and resources needed to grow cotton and other crops more sustainably*. In addition, Better Cotton trains farmworkers so that they can develop responsible working conditions and improve their own living conditions. Better Cotton also combats inequality and empowers women.[319] Better Cotton has defined its mission as follows: *"Our mission is to help cotton communities survive and thrive while protecting and restoring the environment. Because we know the world doesn't just need cotton, it needs Better Cotton."*[320]

The Better Cotton Initiative was launched in 2009. In 2005, multi-stakeholder experts led by World Wildlife Foundation (WWF) met to discuss the future of sustainability in the cotton industry and conceptualized the Better Cotton Initiative (BCI).[321] Presently, the Better Cotton standard applies to around 25% of the world's cotton production. According to Better Cotton, the initiative educates and certifies cotton growers in sustainable agriculture. Better Cotton envisions a sustainable society in which cotton growers and employees are prepared for climate change, environmental dangers, and even global pandemics. Moreover, Better Cotton aims to help cotton producers earn a fair wage and make environmentally responsible decisions in their employment. Increasing conscientiousness around sustainability necessitates ethical cotton.[322]

2.6.2 bluesign®

bluesign® is a network of chemical suppliers, manufacturers, and brands that collaborate to meet bluesign® standards. bluesign® was formed in 2000 to alter the industry's status quo. According to bluesign®, the beginning of the twenty-first century ushered in a new way of thinking and a heightened awareness of environmental concerns.[323]

317 Blecher, 2014, 1
318 Nath et al., 2019, 227
319 Better Cotton Initiative, 2022c
320 Better Cotton Initiative, 2022c
321 Better Cotton Initiative, 2022b
322 Better Cotton Initiative, 2022a
323 bluesign®, 2022b

bluesign® changes the environmental impact of materials over the long term. Furthermore, bluesign® is an independent verifier that delivers trustworthiness and transparency as a solution provider and information giver for the industry, thereby gradually increasing efforts toward sustainable processes.[324] bluesign® has developed solutions using the best possible technologies to help companies increase their sustainable performance. bluesign® takes a holistic approach when viewing each manufacturing stage, from raw materials to the finished product.[325]

The vision and mission of bluesign® are as follows: *"Because the value chain of the textile industry and similar industries must be increasingly accountable, bluesign® inspires and equips brands, manufacturers and chemical suppliers with comprehensive sustainability solutions, so that the industry continuously fosters safer work environments, increasing levels of environmental responsibility, enhanced business value and deeper consumer trust."*[326] bluesign® operates in a way that considers both the people and the environment as well as the resources. bluesign® guarantees that it will improve members' competitive requirements, maximize brands' profitability, and boost trust while simultaneously enhancing a favorable image and reputation.[327]

2.6.3 Fair Labor Association (FLA)

The Fair Labor Association (FLA) was founded in 1999, and its aim is improving workers' lives and working conditions globally. The FLA offers lasting solutions to companies through tools and resources so that they can improve labor practices. *The FLA advocates for greater accountability and transparency from companies, manufacturers, factories, and others involved in global supply chains.*[328]All consumer goods production requires a workforce; however, many improvements to work conditions must be made. The FLA approaches improving workers' lives with multiple stakeholder engagement and believes that production should be fair and ethical. The FLA aims to hold brands accountable for improving the lives of workers in the supply chain by adopting the FLA's Code of Conduct.[329]

Third-party audits help brands communicate responsibly with consumers. Additionally, the FLA provides opportunities for civil society organizations and companies to collaborate.[330] The mission of the Fair Labor Association is as follows: *"The mission of the Fair Labor Association is to combine the efforts of business, civil society organizations, and colleges and universities to promote and protect workers' rights and improve working conditions globally through adherence to international*

324 bluesign® , 2022c
325 bluesign® , 2022c
326 bluesign® , 2022b
327 bluesign® , 2022a
328 Fair Labor Association, 2022b
329 Fair Labor Association, 2022d
330 Fair Labor Association, 2022d

standards."[331] The FLA has prioritized fair compensation for all workers and works toward the living wage concept. However, the association still aims to create progress in many areas, including the importance of trade unions, fairness to unfairly fired workers, labor-management issues, and training and education in factories for both management and workers.[332]

2.6.4 Fair Trade Certified

The Fair Trade Certified organization refers to itself as a global movement. It is a network that includes advocates, organizations, producers, and companies. Fair Trade is committed to helping make sustainable choices over the more obvious ones. Fair Trade Certified is based on the principle that *"the products bought and sold every day are connected to the livelihoods of others."* Fair Trade enables consumers to make conscientious choices for responsibility. When consumers buy Fair Trade Certified products, they support responsible companies throughout the entire supply chain.[333] The mission of Fair Trade Certified is as follows: *"We are building an innovative model of responsible business, conscious consumerism, and shared value to eliminate poverty and enable sustainable development for farmers, workers, their families, and their communities around the world."*[334]

The history of Fair Trade Certified began with Paul Rice in Nicaragua. He recruited coffee farmers to sell coffee on fair trade terms. In the first year, he engaged 24 farmers, who received a higher salary and were able to make investments in their home environment. These farmers received, for example, electricity and running water that they could not afford previously. When time passed, the group increased to include more than 3000 families. In 1998, Paul traveled back to the United States and launched Fair Trade USA.[335]

2.6.5 Fair Wear Foundation

Fair Wear Foundation believes in ethical garment production, including workers' rights to a safe working environment and fairly paid employment. The sewing, cutting, and trimming processes are the most labor-intensive parts of garment production. Therefore, Fair Wear Foundation concentrates its work on those stages. FWF's member brands are committed to increasing the ethicality of their supply chain. FWF collaborates with factories, trade unions, NGOs, and governments to solve social responsibility challenges.[336]

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331 Fair Labor Association, 2022c
332 Fair Labor Association, 2022a
333 Fair Trade Certified, 2022b
334 Fair Trade Certified, 2022a
335 Fair Trade Certified, 2022a
336 Fair Wear Foundation, 2022c

ILO Conventions and the UN's Declaration on Human Rights form the core of the Fair Wear code.[337] Furthermore, Fair Wear Foundation wants to promote eight topics: *"Joining forces with industry influencers, Ending gender-based violence, Remediating worker issues, Taking action in production countries, Supporting worker empowerment, Creating change on the factory floor, Pushing for living wages and Supporting their member brands."*[338]

The Fair Wear Foundation was established in the Netherlands in 1999. The collaboration began with a pilot project with only four Dutch companies.[339] Factory and working conditions and brands' production management are closely related. For example, the production plan must be realistic, as unrealistic deadlines lead to unreasonable overtime. Fair Wear Foundation works on principles of transparency, and it publicly publishes its factory checks. This increases accountability.[340] Fair Wear Foundation focuses on the issues that make the most significant impact on garment workers' lives. The living wage issue is crucial because workers across the garment industry are rarely paid enough to live completely on their salary. Gender-based violence is also a crucial problem because garment workers are mostly women. Discrimination and harassment are daily problems that must be solved.[341]

2.6.6 Forest Stewardship Council (FSC)

For 25 years, the Forest Stewardship Council (FSC) has delivered forest certification and united different experts to collaborate on environmental, social, and economic matters to responsibly manage the worlds' forests.[342] The Forest Stewardship Council has the following mission: *"FSC will promote environmentally appropriate, socially beneficial, and economically viable management of the world's forests."*

The following describes the vision of the Forest Stewardship Council: "The true value of forests is recognized and fully incorporated into society worldwide. FSC is the leading catalyst and defining force for improved forest management and market transformation, shifting the global forest trend toward sustainable use, conservation, restoration, and respect for all."[343] According to the Forest Stewardship Council, the Earth Summit in Rio in 1992 did not manage to agree about deforestation, and therefore, the voluntary group founded a new concept. This group comprised companies, environmentalists, and community leaders.[344]

337 Fair Labor Foundation, 2022
338 Fair Wear Foundation, 2022c
339 Fair Wear Foundation, 2022c
340 Fair Wear Foundation, 2022a
341 Fair Wear Foundation, 2022b
342 Forest Stewardship Council, 2022b
343 Forest Stewardship Council, 2022b
344 Forest Stewardship Council, 2022a

2.6.7 Oeko-Tex Standard

Oeko-tex has two standards: Oeko-tex 100 and Oeko-Tex 1000. The former is the individual product standard, whereas the latter is the production standard for manufacturers of Oeko-Tex 100 products.[345] Oeko-tex® is a standard for textiles and leather products, and its standards demonstrate that products are produced in an environmentally and socially responsible way. The label also reassures consumers that there are no harmful substances and that the products are tested.[346]

Garments comprise various components, such as accessories and thread in the fabric. The Oeko-Tex standard ensures that all parts of the clothing are safe. Oeko-Tex's partner institutes perform tests according to Oeko-Tex directions. The Oeko-Tex requirements for substances are often stricter than national and international requirements. Oeko-Tex updates its criteria annually according to the most recent knowledge, which helps manufacturers and brands keep their practices up to date .[347] The mission of Oeko-Tex is as follows: *"Our mission is to create trust in textiles and leather and their production: through increased product safety, improving sustainable production, and a sustainable, transparent value-creation chain."*[348] Oeko-Tex, which was founded in 1992, provides opportunities for companies to make responsible choices in their clothing production. It is also a well-known sustainability standard brand that increases consumer awareness. Both factors are the main aims of Oeko-Tex.[349]

2.6.8 Protect Our Winters (POW)

Protect Our Winters (POW) is an outdoor climate action charity that helps outdoor people become climate advocates to achieve systemic solutions to climate change. The organization delivers community education and engagement programs and organizational climate action support, and it campaigns for systemic policy solutions. Protect Our Winters claims that the world is facing a climate emergency and time to act is running out. However, they believe that together, outdoor people can be a force for positive change.[350]

Companies can impact climate action, but they are not often aware of the actions they can take to do so. Protect Our Winters builds partnerships with its member companies, who provide the funding and in turn receive education and resources to reduce their carbon footprint and make other environmentally friendly actions.[351] Jeremy Jones is a snowboarder who became concerned about the snow situation on

345 Maia et al., 2013, 187
346 Oeko-Tex, 2022a
347 Oeko-Tex, 2022c
348 Oeko-Tex, 2022b
349 Oeko-Tex, 2022b
350 Protect Our Winters, 2022a
351 Protect Our Winters, 2022c

slopes in 2007. He wanted to help, but he could not find a suitable organization for his purposes. Therefore, Jones founded Protect Our Winters.[352] POW works in various ways: they offer community education, create engagement programs, provide organizational climate action support for companies, and actively campaign for systemic policy solutions.[353]

2.6.9 The Conservation Alliance

The members of the Conservation Alliance are environmentally responsible companies. The Conservation Alliance collects annual membership dues, which are delivered to grassroots environmental organizations. Member companies can then decide where the Conservation Alliance's funding is directed. The Conservation Alliance supports various environment protection campaigns and projects.[354] Its mission is as follows: *"We harness the collective power of business and outdoor communities to fund and advocate for the protection of North America's wild places."*

The following statement describes the vision of Conservation Alliance: *"A planet where wild places, wildlife, and people thrive together."*[355] The Conservation Alliance provides an opportunity for collaboration between companies and the conservation community. Nature is important for the outdoor industry, and these companies are willing to participate in conservation work. Thus, although the members of the Conservation Alliance are competitors, they hold a common interest.[356] The Conservation Alliance has listed the benefits of its membership. First, belonging to the Conservation Alliance demonstrates the company's *commitment to protecting the wild places that benefit outdoor recreation.* As a result, the company can support its customers' passion for recreation on protected lands and water. Additionally, companies enjoy networking with environmentally aware outdoor brands and suppliers. They can also participate in a funding program and allow employees to participate in a variety of preservation associations, thereby supporting the employees' well-being.[357]

This theoretical background included a various dimensions of responsibility in relation to outdoor gear. To summarize, several research studies have been conducted on each of these subjects, but few studies have investigated responsibility by holistically examining the life cycle, supply chain, or outdoor clothing industry. The next chapter presents the research data and methods.

352 Protect Our Winters, 2022a
353 Protect Our Winters, 2022b
354 The Conservation Alliance, 2022a
355 The Conservation Alliance, 2022b
356 The Conservation Alliance, 2022b
357 The Conservation Alliance, 2022c

3 RESEARCH DATA AND METHODS

This chapter reveals how this research was conducted. The section on the research data introduces the 12 companies that were investigated in this study, as well as the rationale for choosing them. The following sections presents the chosen research method, including the data analysis method.

3.1.1 The research data

In alphabetical order, the 12 outdoor companies researched were Arc'teryx, Columbia Sportswear Company, Fjällräven, Haglöfs, Houdini, howies, Jack Wolfskin, Millet, The North Face, Patagonia, Peak Performance, and Sierra Designs. I concentrated only on the web pages of these brands, although another possibility for research would have been interviewing staff members of the brand. In 2021, analyzing sustainability reports and social media would have been possible, but these did not exist systematically in 2009.

As part of the data collection process, I took screenshots of the brands' sustainability-related websites in 2009 and constructed collages of the brands' sustainability statements. These are presented in the Results chapter. In 2021, I had collected such a high quantity of visual material that I decided to save the original pictures; these are also presented with the results. I took a screenshot of the home web page of each brand to highlight whether mentioned responsibility on their home page. The screenshots also demonstrated the passing of time and the development of the brands' visual presentation, although I found that the brands' style, including their logos, mostly remained the same. One alternative research method would have been performing a picture analysis of the screenshot images. Here, they are presented for the reader to see and compare the images taken 12 years apart. Providing the visual images in the results adds to the understanding of how the brands communicate about different sustainability and responsibility issues.

These companies have different types of owners. Five belong to a portfolio of concern; Arc'teryx and Peak Performance are part of Amer Sports, The North Face belongs to VF, Haglöfs belongs to Asics, and Millet belongs to Inspiring Sport Capital. Columbia Sportswear Company is a concern that owns other brands. Patagonia, howies, Fjällräven, Houdini, Jack Wolfskin, and Sierra Designs are differently sized independent brands. I delimited the sustainability policies of these concerns out of the research. However, further research could investigate the concern policies and what decisions the brands can make themselves.

When I initially selected the brands for this research, I did not consider their business strategy or target customers because I focused on finding companies that considered sustainability. For example, Patagonia has profiled itself as an activist company and forerunner in sustainability issues, whereas Peak Performance and Sierra Designs, for example, have concentrated on specific activities. The expectations of the brands' target groups vary as well, but this research did not examine consumer expectations nor the brands' positioning regarding sustainability issues compared to competitors. This information would have provided additional insight, but collecting it reliably from all companies would have been difficult and partially impossible. However, sustainability is not a top business strategy priority for all outdoor companies; some companies compete with low prices and cheap production. These 12 outdoor companies were selected in 2007 because they mentioned sustainability.

This research aimed to understand the ongoing field of responsibility in the outdoor industry and how it changed over the 12 years under study. The following sections introduce the 12 outdoor clothing companies and their vision, mission, and philosophy (if they were accessible). All 12 companies still exist.

3.1.2 Arc'teryx

Arc'teryx was founded in 1991 by climbers in Canada. Rock Solid was the name of the former company structure, which was formed by Dave Lane in 1989. In 1991, the company's creator, Jeremy Guard, changed the company's name to Arc'teryx to represent the company's objective to develop disruptive evolutionary innovation in the outdoor products market. The term Arc'teryx is derived from Archaeopteryx, one of the earliest birds. Michael Hofler's logo was inspired by the transitional shape of dinosaurs and birds. The headquarters, which is known as ARC'One, is a design hub and local production facility in North Vancouver, British Columbia, Canada.

Vision, mission, and philosophy

Arc'teryx sells outdoor clothing and climbing gear. Their web page stated, *"At Arc'teryx, the goal is to create equipment that enables a person to be immersed in the moment of doing, regardless of external conditions."*[358] Arc'teryx claimed that its purpose is to build the finest products possible. They stated that their designers, materials experts, pattern makers, and product developers know what they want, how to use it, and why it must work. They also said that they intended to develop products that do not currently exist. According to Arc'teryx, their products are designed to meet a need, and their designers test the items alongside outdoor industry professionals. They were proud of the quality of their products, for which extensive quality and field

358 (Arc'teryx, 2021c)

testing was conducted.[359] Arc'teryx claimed that product philosophy, responsible manufacturing, and community engagement are the lenses of sustainability. They stated, *"A design company is not in the artifact business anymore. Design is a matter of consequence."*

They considered not only the quality of their products but also their influence on people and the environment. They recognized the climate crisis and asserted that it influences how they view themselves and conduct business.[360] Arc'teryx recognized their interdependence and with the living environment, and they believed that climate justice could not be reached without tackling global injustices. They were committed to decreasing their environmental footprint and increasing their positive social impact by blending design, community, research, and enthusiasm. They believed that they could effect positive change through their primary operations and partnership with other organizations.[361]

359 (Arc'teryx, 2021c)
360 (Arc'teryx, 2021c)
361 (Arc'teryx, 2021c)

Home page of Arc'teryx in 2009 and 2021

In 2009, Arc'teryx highlighted the technical properties and quality of their products and used a picture of a harsh mountain in their webpage header (Fig. 3). In 2021, the technical properties of the product were the header's subject (Fig. 4).

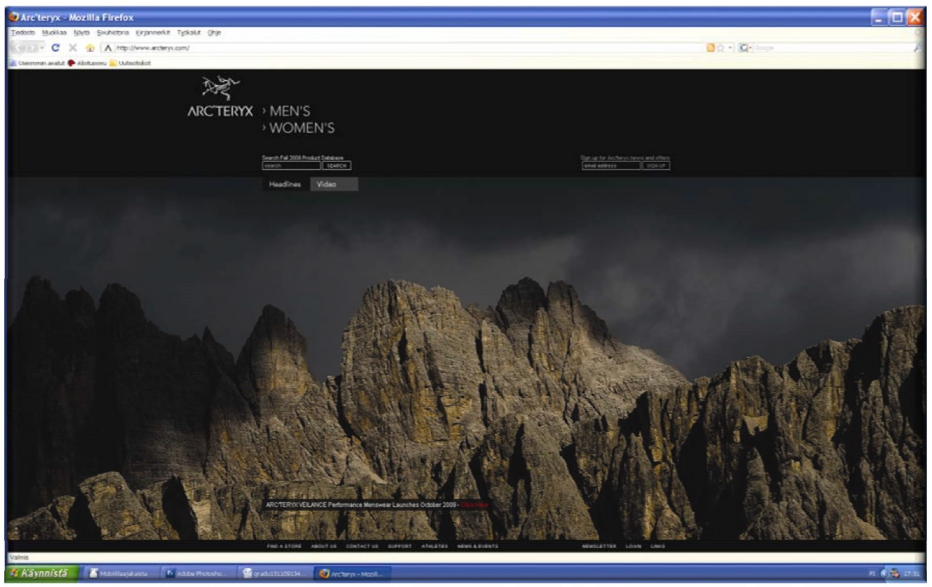


Figure 3. *Arc'teryx home page on 11.13. 2009 (Arc'teryx, 2009; Seppälä, 2010, 85.)*

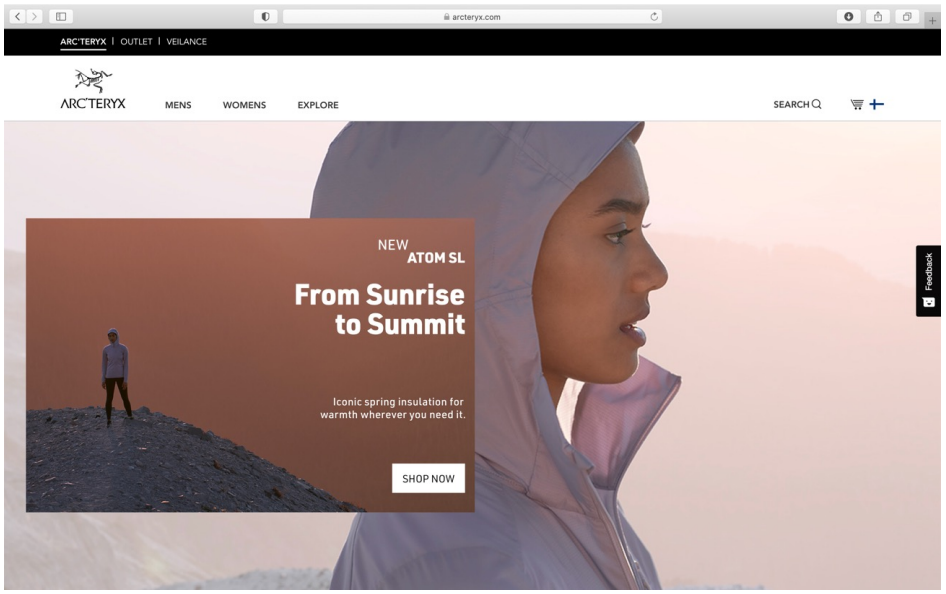


Figure 4. *Arc'teryx home page on 03.30.2021 (Arc'teryx, 2021.)*

3.1.3 Columbia Sportswear Company

Paul Lamfrom founded Columbia Sportswear Company in the United States in 1938. The company headquarters is located in the Portland metropolitan area in Oregon, the United States. Columbia Sportswear Company is now a public company, which has required from them transparency and thorough thinking. Columbia Sportswear started as a hat distributor and was called Columbia Hat Company. Later, the company became frustrated with suppliers and began manufacturing its own products.

The company changed its name to Columbia Sportswear Company in 1960. Columbia Sportswear Company has a long and rich history; the family was close to losing the company, so the company's history is a success story of a family business. "*Columbia Sportswear Company designs and distributes outdoor and active lifestyle apparel, footwear, accessories, and equipment.*" Columbia Sportswear Company aimed at innovation in its product development, believing that innovation is everyone employee's responsibility.

Vision, mission, and philosophy

Columbia Sportswear Company had a clear vision of its values, stating, *"One of our core values is to do the right thing, not just for our company, but also for our consumers, customers, employees, and communities."*[362] Columbia referenced a quote from CEO Tim Boyle on their website: *"Deep commitment towards the people and families who live, work, and play in the communities where they operate and to the scarce resources that they all have a responsibility to steward effectively."*[363]

The company has acknowledged the need for its corporate responsibility team to act responsibly toward communities and the environment. According to the company's Vice President of Corporate Responsibility, the corporate responsibility team has developed policies, procedures, and resources to ensure that the company operates in a responsible manner.[364]

362 Columbia Sportswear Company, 2021b
363 Columbia Sportswear Company, 2021b
364 Columbia Sportswear Company, 2021b

Home page of Columbia Sportswear Company in 2009 and 2021

In 2009, Columbia Sportswear Company used images of freeride skiing on its home page header (Fig. 5). In 2021, they placed their responsibility actions on their header (Fig. 6).

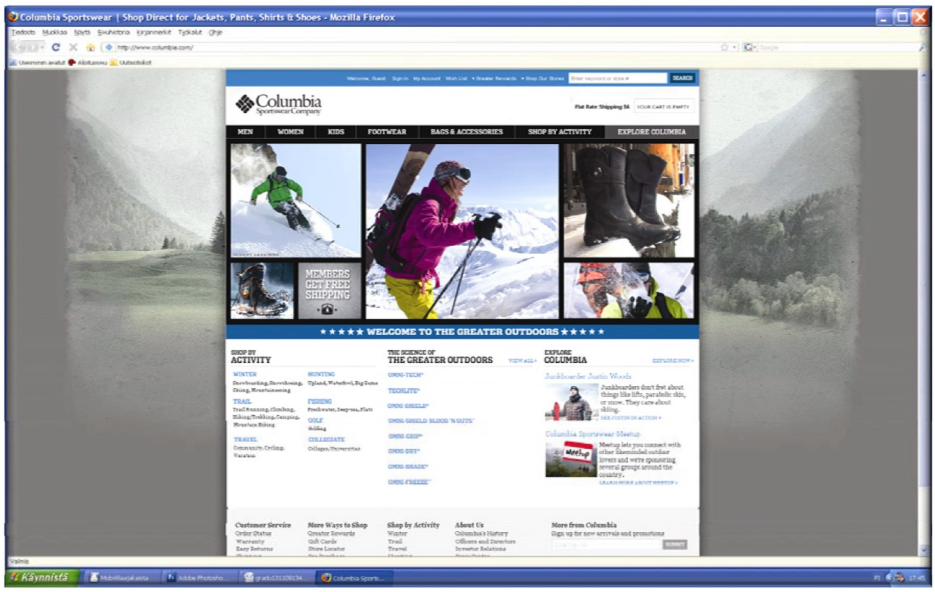


Figure 5. *Columbia Sportswear Company home page on 11.13.2009 (Columbia Sportswear Company, 2009; Seppälä, 2010, 89.)*

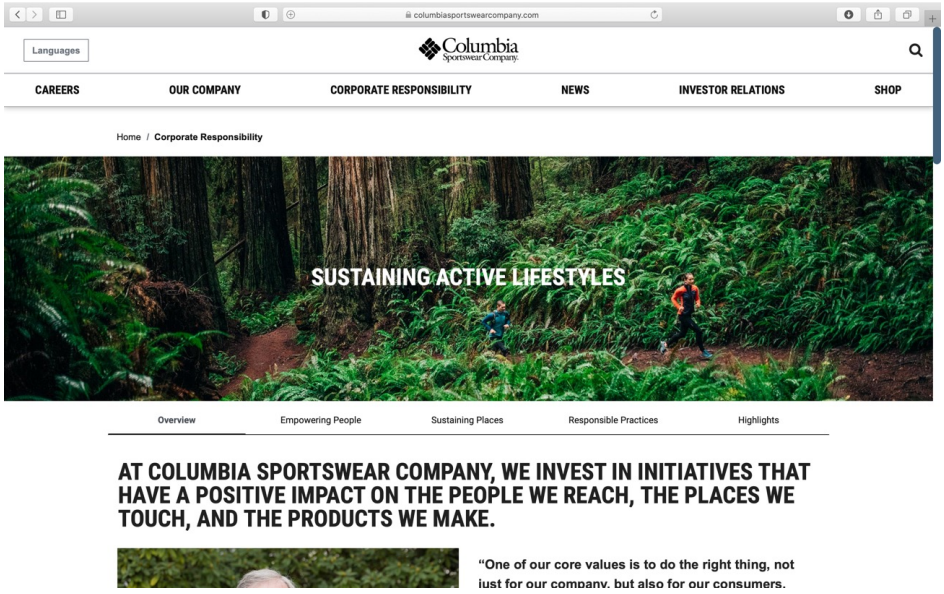


Figure 6. *Columbia Sportswear Company home page on 03.30.2021 (Columbia Sportswear Company, 2021.)*

3.1.4 Fjällräven

Åke Nordin founded Fjällräven in 1960 in Sweden. Fjällräven means *"the arctic fox"* in Swedish. The company specializes in outdoor clothing and equipment. Fourteen-year-old Åke Nordin was disappointed by a backpack and created a lighter and stronger backpack than any alternative at the time. The aluminum frame backpack and condensation-free tents became popular when Swedish law allowed four weeks of statutory holiday. The Fjällräven headquarters is located in Örnsköldsvik, Sweden. Fjällräven products can be recognized by the arctic fox logo and small Swedish fabric flag in the seam.

Vision, mission, and philosophy

Fjällräven recognized its impact: *"Everything we do has an impact on the environment around us and the people and animals that inhabit it. As an outdoor company, we are acutely aware of this impact, and we do our utmost to keep our environmental footprint as small as possible. And this is a team effort."*[365]

Fjällräven claimed that when it makes decisions about materials and production facilities, it considers the environment.[366] They also claimed that they have made, and will continue to make, mistakes. This honesty is a new phenomenon in responsibility communication. The company also stated that they try to learn from their mistakes when innovating. Their principle is that *"they never sit back and relax, thinking what they are doing now is good enough."* They use the term *room for improvement* to remember that they can always do better.[367]

Fjällräven has identified a variety of visions. One of their primary goals is to manufacture products that are in harmony with nature. Second, they want to create apparel and equipment that will be passed down from generation to generation. Third, they intend to hold both themselves and their suppliers to the highest possible standards. Finally, they are enthusiastic about exposing more people to nature and the plethora of benefits it offers.[368]

365 Fjällräven, 2021b
366 Fjällräven, 2021b
367 Fjällräven, 2021b
368 Fjällräven, 2021b

Home page of Fjällräven in 2009 and 2021

In 2009, Fjällräven used visual images of Swedish Lapland in its home page header (Fig. 7.). In 2021, they highlighted their PFC-free water repellency treatment (Fig. 8.).

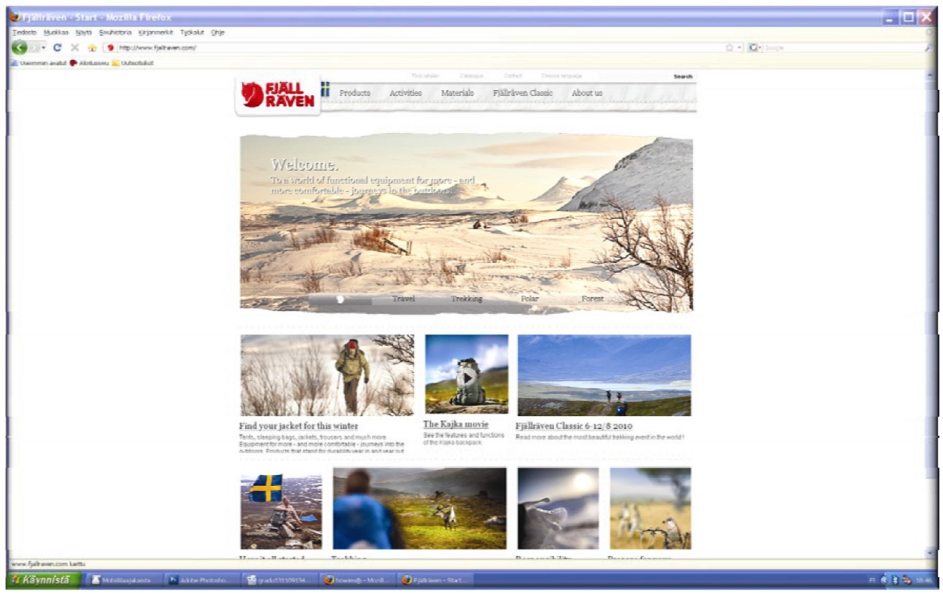


Figure 7. *Fjällräven home page on 11.13.2009 (Fjällräven, 2009; Seppälä, 2010, 92.)*

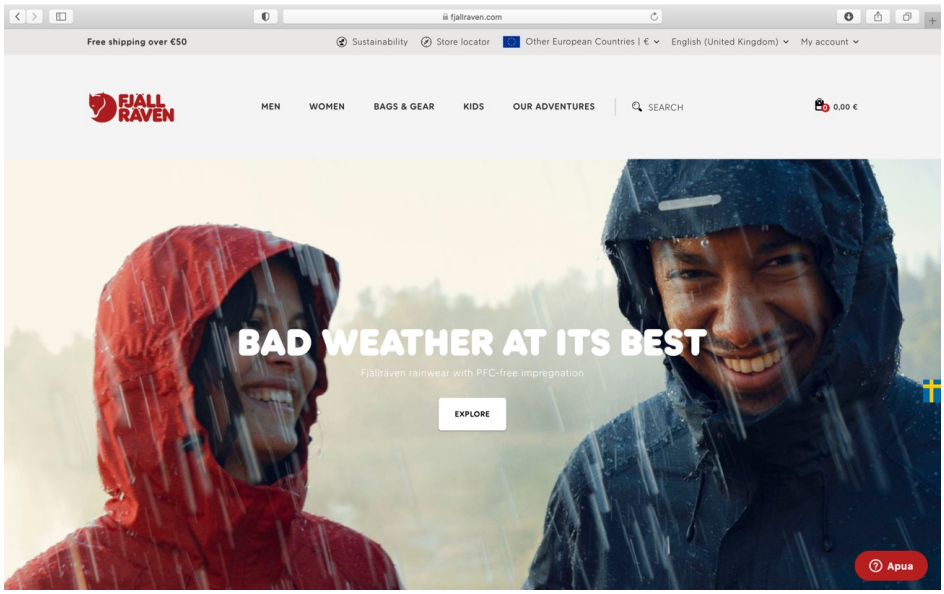


Figure 8. *Fjällräven home page on 03.30.2021 (Fjällräven, 2021.)*

3.1.5 Haglöfs

Carpenter Wiktor Haglöf founded Haglöfs in Sweden in 1914. He was determined to create a backpack that could be used in all weather conditions. Haglöfs stated that they are constantly seeking progress and new technical designs that require craftsmanship.

Vision, mission, and philosophy

Haglöfs stated, *"There is no such thing as a sustainable outdoor brand."* Instead, Haglöfs claimed that they always leave a footprint, no matter how good their intentions are. Haglöfs considered the safety of the chemicals, suppliers' working conditions, and the supply chain's impact on the climate.[369] Before a product arrives in the store, it undergoes many processes, which always leave a negative ecological footprint. Haglöfs claimed, *"Many people who work with outdoor products are passionate about a healthy nature, so it is quite natural that they are working to find solutions to reduce their negative footprint."*[370] Haglöfs acknowledged that improving responsibility matters take time, but it desired to continue participating in the process. On their webpage, they stated, *"Step by step. Detail by detail. A sustainable outdoor industry. It's possible!"*[371]

369 Haglöfs, 2021
370 Haglöfs, 2021
371 Haglöfs, 2021

Home page of Haglöfs in 2009 and 2021

In 2009, Haglöfs had a sustainability statement *"We are running out of planet"* on its home page header (Fig. 9). In 2021, they had moved their technical insulation system to the header (Fig. 10).

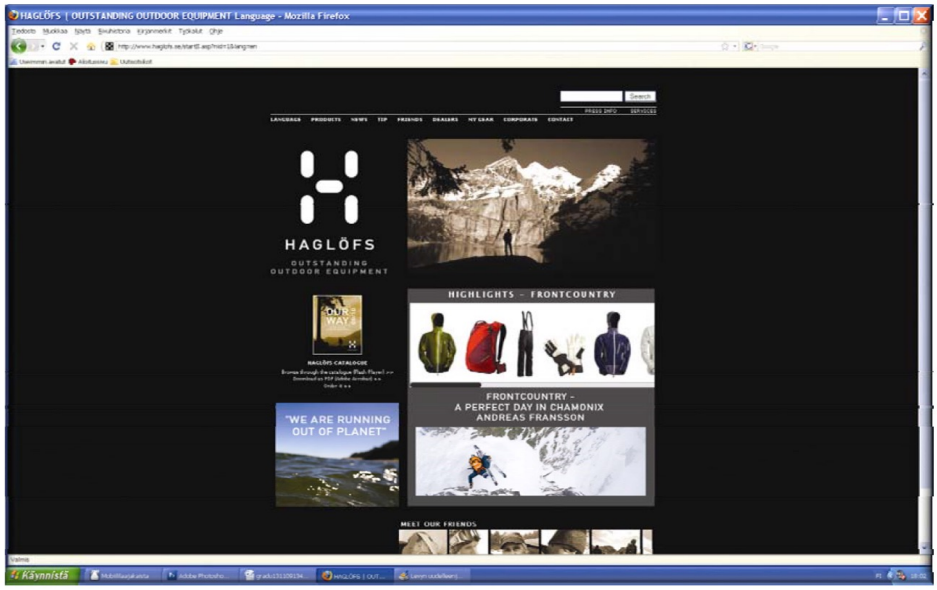


Figure 9. *Haglöfs home page on 11.13..2009 (Haglöfs, 2009; Seppälä, 2010, 96.)*

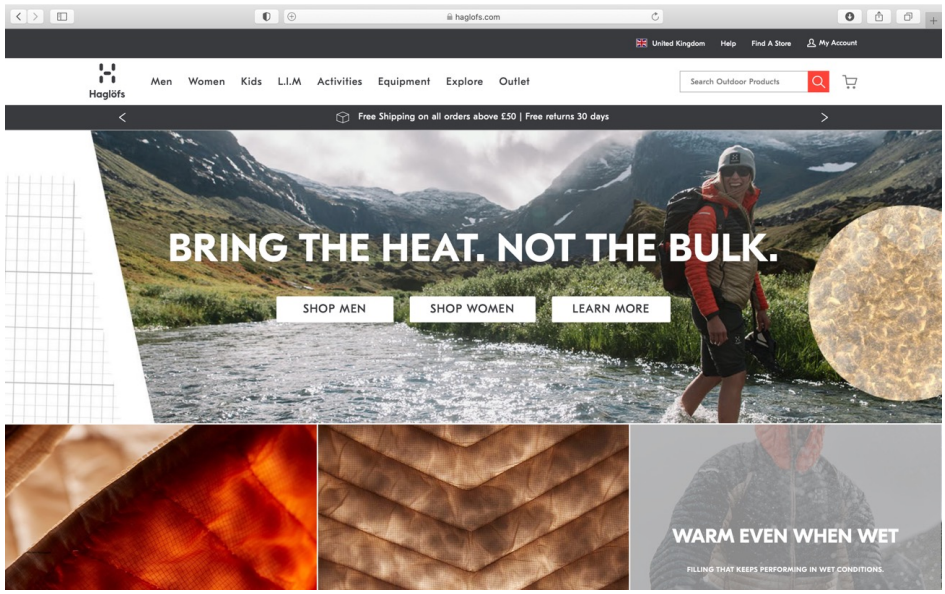


Figure 10. *Haglöfs home page on 03.30.2021 (Haglöfs, 2021.)*

3.1.6 Houdini

Lotta Giornofelice founded Houdini Sportswear in 1993 in Sweden. She worked as a climbing and off-piste skiing instructor and guide. The company was named after an incident in the mountains when someone named Houdini faced a dangerous situation. She was missing clothing for start-and-stop activities like climbing and ski touring. She made the first fleece underwear herself and became famous for the underwear in the climbing and skiing community. Lotta faced a problem when Malden Mills, later Polartec, would not take orders under 1000 meters. However, she convinced them to take the order by visiting their mills. Giornofelice still owns part of the company but is no longer part of the daily operations. Houdini said they want to create better products, challenge existing norms, and change that about their company in which they do not believe.

Vision, mission, and philosophy

Houdini claims that "*sustainability is at the heart of everything we do*". For Houdini, sustainability and good business are not paradoxical. On the contrary, they state that it is necessary. Therefore, they want to be active forerunners, improving their business and leading the entire industry and society as a whole.[372] Their vision is as follows*: "Inspire humanity to reconnect to nature, lead a healthier and happier lifestyle in partnership with nature, evolve as individuals, and form a prosperous society on a thriving planet for us and future generations."*[373] Inspired by their vision, employees at Houdini are keen to innovate environmentally friendly products and services and engage with the active community globally.[374]

372 Houdini, 2021e
373 Houdini, 2021e
374 Houdini, 2021e

Home page of Houdini in 2009 and 2021

In 2009, Houdini had an outdoor reference and product in its header (Fig.11.). In 2021, they highlighted redesigned innovations in their trousers (Fig. 12.).

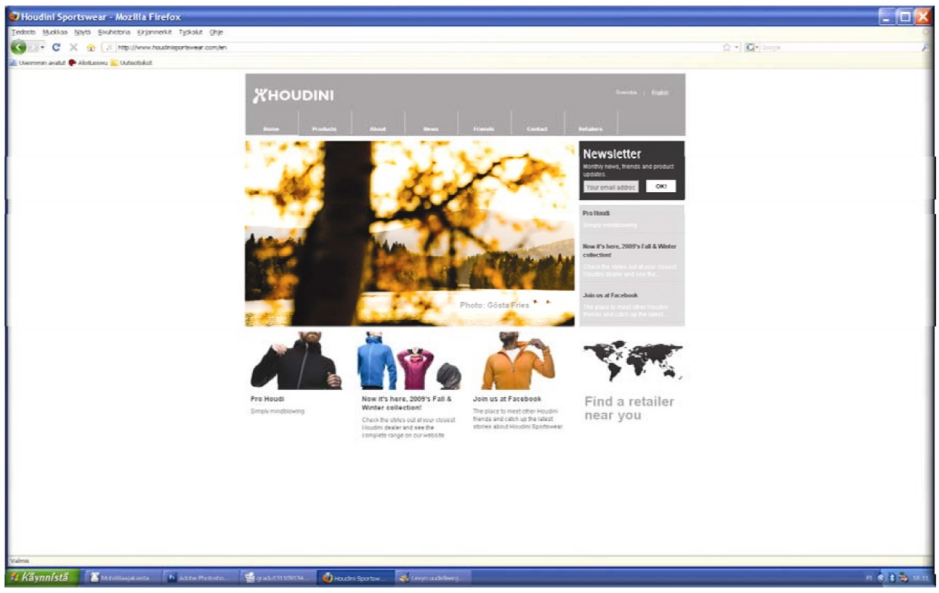


Figure 11. *Houdini home page on 11.13.2009 (Houdini Sportswear, 2009; Seppälä, 2010, 100.)*

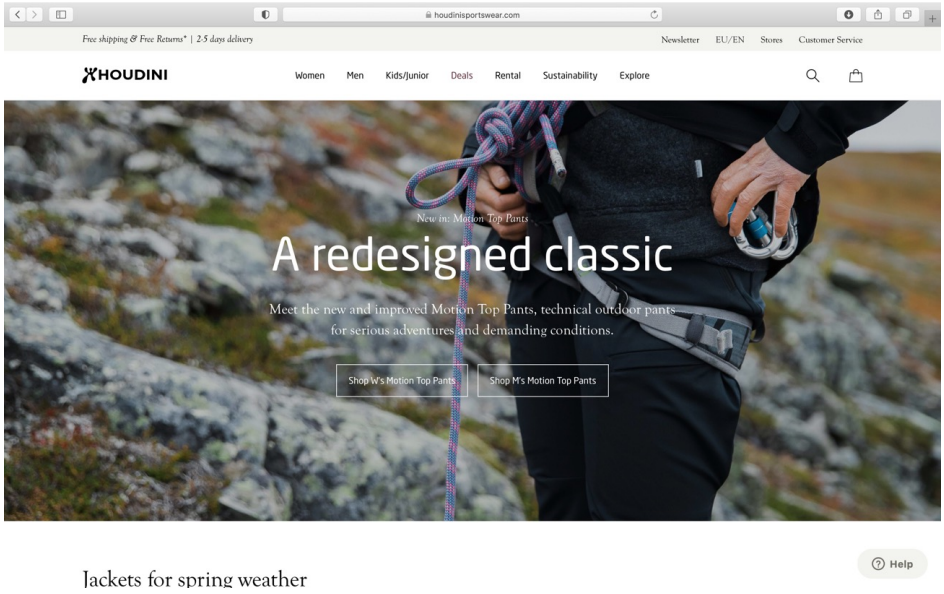


Figure 12. *Houdini home page on 03.30.2021 (Houdini Sportswear, 2021.)*

3.1.7 howies

howies was founded in the United Kingdom in 1995 by Clare and David Hiett, and the name was created from Clare's maiden name, Howells. howies' intent was to make lower impact clothing for running, cycling, the outdoors, and everyday wear. They claim that their goal was to *find better, more sustainable ways of running a business from the beginning.*[375]

Vision, mission, and philosophy

The following statement is howies' responsibility claim: *"Since we started way back in 1995, our goal at howies was to find better, more sustainable ways of running a business. For us, that means a commitment to using more considered fabrics, as well as manufacturing techniques that do less damage to the environment. That responsibility starts at the design stage and carries through to production; from how our products are delivered to your door, how they perform, then eventually what happens to them when they are no longer wearable."*[376] This is all they claimed on their webpage on responsibility vision.

375 howies, 2021
376 howies, 2021

Home page of howies in 2009 and 2021

In 2009, howies used images of the Welsh countryside in their header (Fig. 13). In 2021, they highlighted their products' high quality and lower impact (Fig. 14).

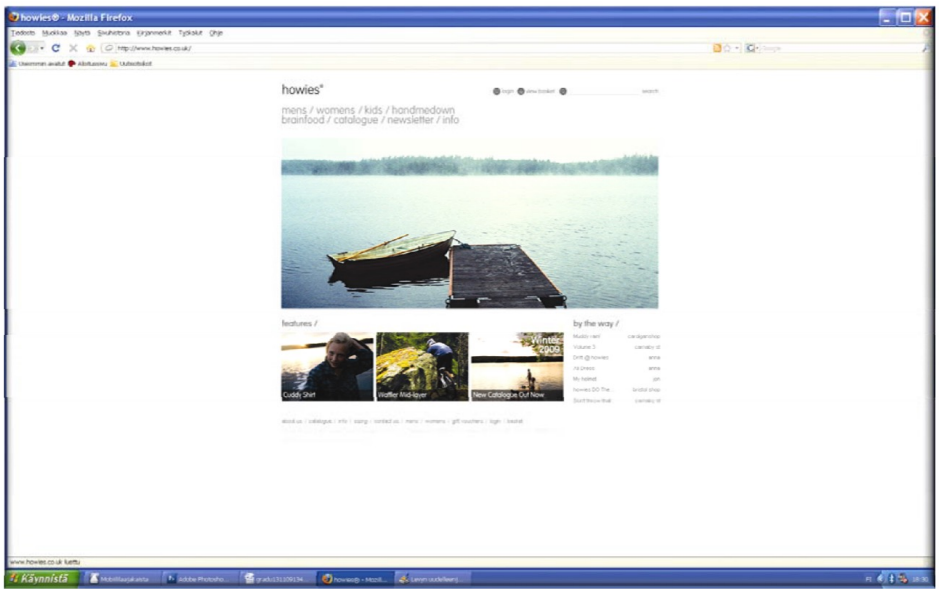


Figure 13. *howies home page on 11.13.2009 (howies, 2009; Seppälä, 2010, 103.)*

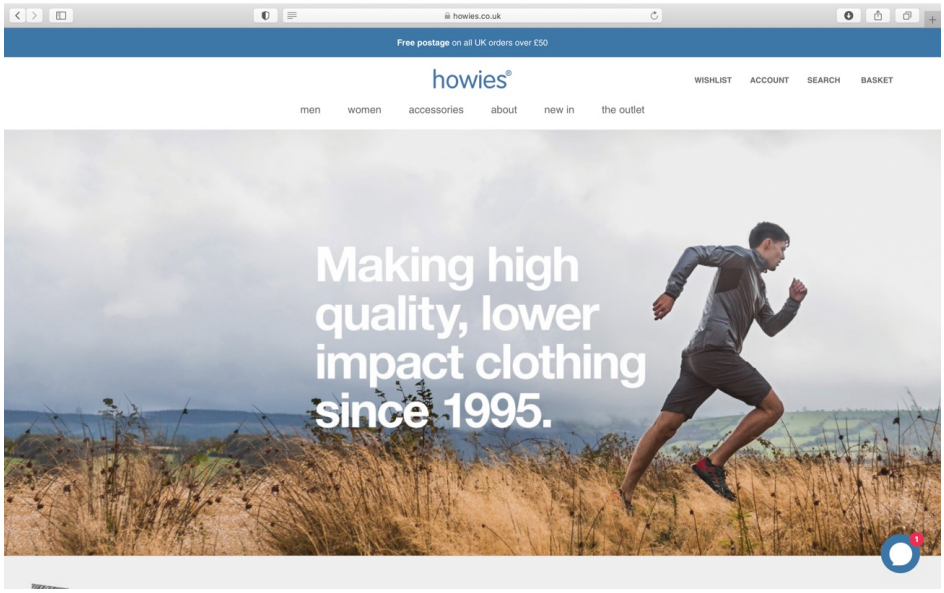


Figure 14. *howies home page on 03.30.2021 (howies, 2021.)*

3.1.8 Jack Wolfskin

Ulrich Dausien founded Jack Wolfskin in Germany in 1981. Dausien created the name Jack Wolfskin with his friends on an Alaska trip. From the beginning, the company was committed to developing technological innovations and trying new ideas. Dausien stated, *"While I was studying marketing, it became clear that you can only achieve real success if you create and develop your own brands."* He discovered that making his own brand was satisfying, and Jack Wolfskin became successful.

Vision, mission, and philosophy

Jack Wolfskin acknowledges both social and environmental responsibility in their actions. They claim that the success of the company and responsibility actions are not paradoxical.[377] Jack Wolfskin provided a vision statement on their web page: *"Proactively taking responsibility for social issues is a part of our corporate identity and culture. We firmly believe that fairness, environmental awareness and corporate social responsibility do not run contrary to the success of our company."*[378]

Like many outdoor brands, Jack Wolfskin respects nature, from which they make their business. They mentioned conservation work (or protecting forests, rivers, lakes, and seas) as important to them. They highlighted the importance of social sustainability and transparency of the supply chain.[379]

377 Jack Wolfskin, 2021d
378 Jack Wolfskin, 2021d
379 Jack Wolfskin, 2021d

Home page of Jack Wolfskin in 2009 and 2021

In 2009, Jack Wolfskin addressed alpinism and protection from alpine conditions in their header (Fig. 15). In 2021, they were creating inspiration about a new adventure (Fig. 16).

Figure 15. *Jack Wolfskin home page on 11.13.2009 (Jack Wolfskin, 2009; Seppälä, 2010, 107.)*

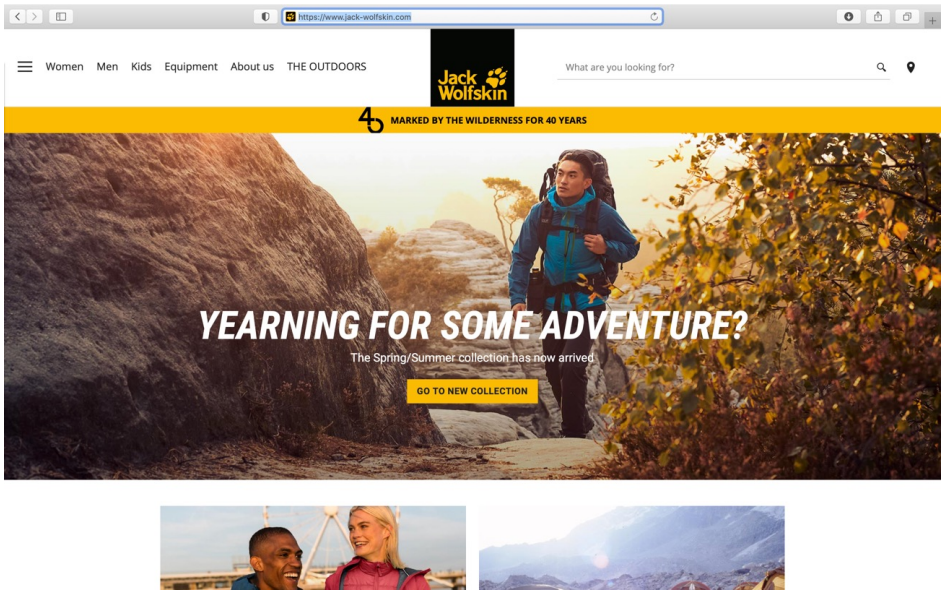


Figure 16. *Jack Wolfskin home page on 03.30.2021 (Jack Wolfskin, 2021.)*

3.1.9 Millet

Marc and Hermance Millet founded Millet in France in 1921. They began by producing grocery and food bags for their grocery store customers in Lyon. Later, they moved to Annecy. After Marc's death, Hermance took over the business and later passed it to her children, René and Raymond, in 1945. The first mountaineering backpacks were designed with the help of Louis Lachenal in 1950 and used to climb Annapurna, the first 8,000-meter summit reached by a human.

Vision, mission, and philosophy

Millet is an 80-year-old company that aims to support mountain athletes with technical and efficient products. They claimed that they stretch their limits to invent better products. They consider the product life cycle and every innovation stage when creating new products.[380] They also consider how humans use their products and the aspects of nature in which people use the products. They have committed to reducing their environmental impact, protecting nature, and supporting local communities. They want to be a sustainable company and identify reaching this goal as a long and progressive expedition.[381]

380 Millet, 2021
381 Millet, 2021

Home page of Millet in 2009 and 2021

In 2009, Millet displayed the slogan *"True products, real people"* (Fig. 17). In 2021, they celebrated their 100-year anniversary (Fig. 18).

Figure 17. *Millet home page on 11.13.2009 (Millet, 2009; Seppälä, 2010, 110.)*

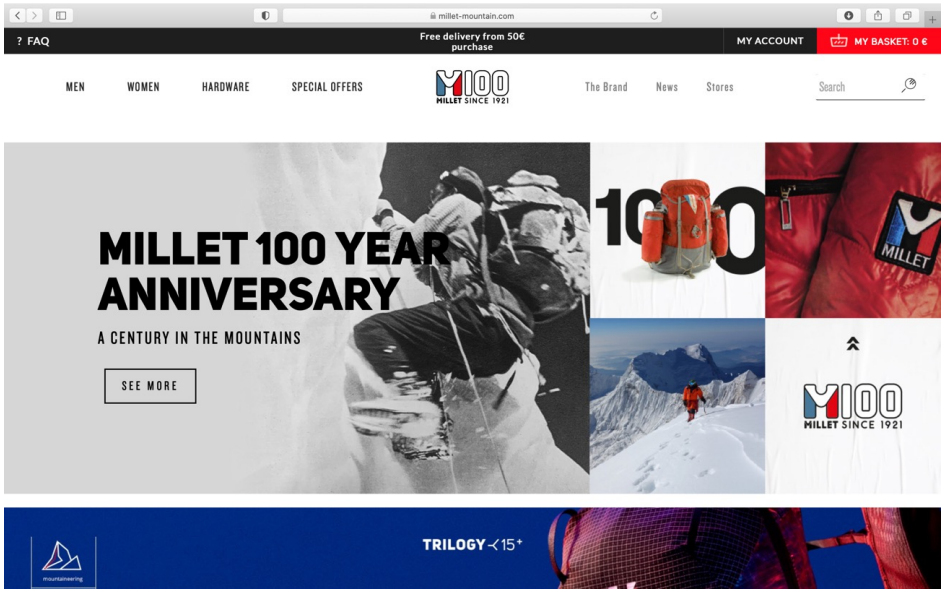


Figure 18. *Millet home page on 03.30.2021 (Millet, 2021.)*

3.1.10 The North Face

Susie and Douglas Tompkins founded the North Face as a climbing equipment retail store in San Francisco, US, in 1968. The North Face is a name for the coldest, most unforgiving side of a mountain. The North Face was founded in San Francisco's North Beach neighborhood when two hiking enthusiasts founded a small mountaineering retail store. In the 1960s, The North Face began sponsoring expeditions and created their mantra *"Never Stop Exploring."* The North Face delivers apparel, equipment, and footwear. They claim to push the limits of innovation and design so that users can push their limits outdoors.[382]

Vision, mission and philosophy

Tompkins created The North Face to enable all types of exploration, from the home backyard to the Himalayas. Over the last 50 years, they have believed that exploration can change, challenge, and help people see the world from new perspectives. The North Face believes that they need to protect the places where people live, play, and operate. They are committed to improving their environmental and social responsibility actions.[383]

382 The North Face, 2021b
383 The North Face, 2021b

Home page of The North Face in 2009 and 2021

In 2009, The North Face presented its layering concept on the main header (Fig. 19). In 2021, they stated that their products are inspired by nature (Fig. 20).

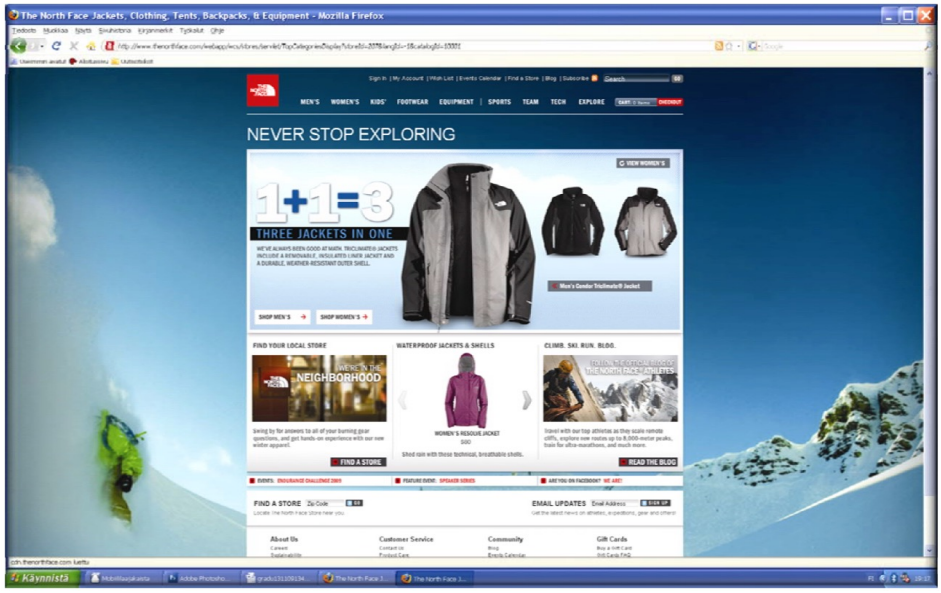


Figure 19. *The North Face home page on 11.13.2009 (The North Face, 2009; Seppälä, 2010, 113.)*

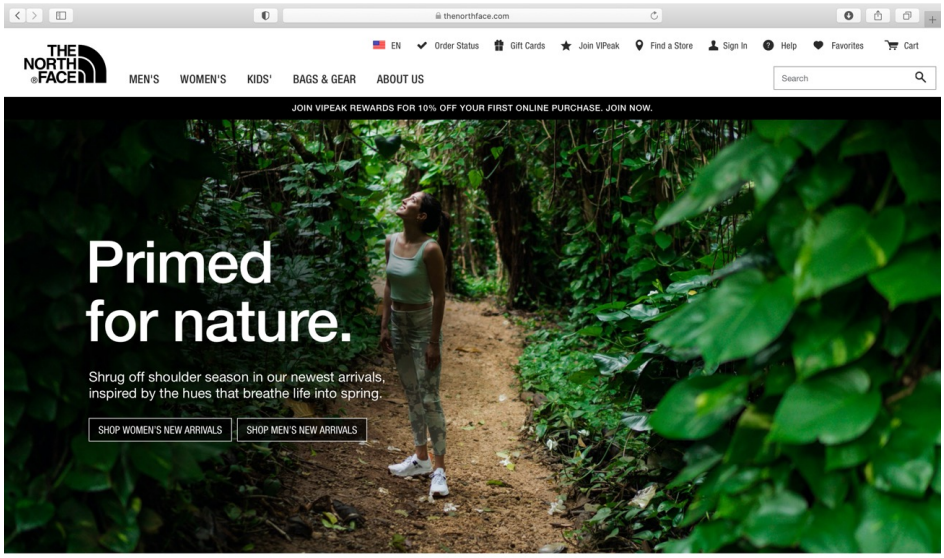


Figure 20. *The North Face home page on 03.30.2021 (The North Face, 2021.)*

3.1.11 Patagonia

Patagonia was founded in 1973 in California, United States. Yvon Chouinard was a rock climber who began to sell handmade mountain climbing gear in 1957 through his company Chouinard Equipment. In 1965, he partnered with Tom Frost. In 1973, Patagonia opened its first store, Great Pacific Iron Works. Patagonia is an activist company that keeps environmental issues in the forefront of its awareness. Yvon Chouinard is a founding member of One Percent for the Planet, established in 1985. Thus, Patagonia is a member company that donates 1 percent of its gross revenue to environmental groups through the organization.[384]

Vision, mission and philosophy

Patagonia acknowledged, *"Everything we make has an impact on the planet."*[385] Thus, the company has established rigorous environmental and animal welfare responsibility programs to govern its material and product production.[386] They have performed various actions for social responsibility. Patagonia believes in transparency and shared information about its supply chain,[387] and they have several visions related to responsibility. Patagonia is a member of the Fair Trade Certified program and actively advances living wages. They use only standardized down and renewable energy, and they have a repair program for their clothes and use fishnets as recycled material. Through their cotton program, they used only organic cotton to support farmers. Overall, they have considered a wide variety of responsibility issues.[388]

384 Patagonia, 2021
385 Patagonia, 2022
386 Patagonia, 2021k
387 Patagonia, 2021k
388 Patagonia, 2021k

Home page of Patagonia in 2009 and 2021

In 2009, Patagonia presented the climbing history of the brand in its header (Fig. 21). In 2021, their main header had an image of climbing with an indication of new arrivals (Fig. 22).

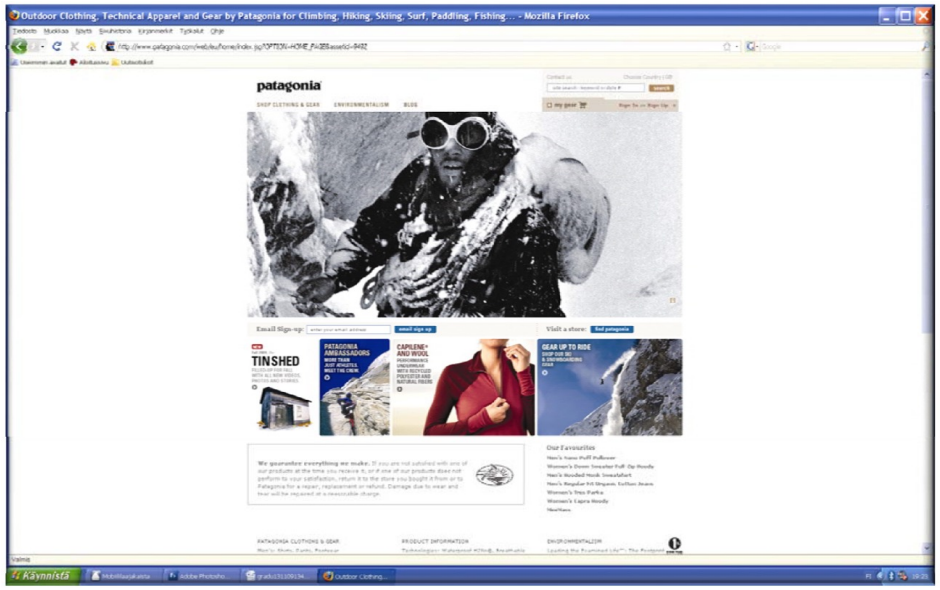


Figure 21. *Patagonia home page on 11.13.2009 (Patagonia, 2009; Seppälä, 2010, 117.)*

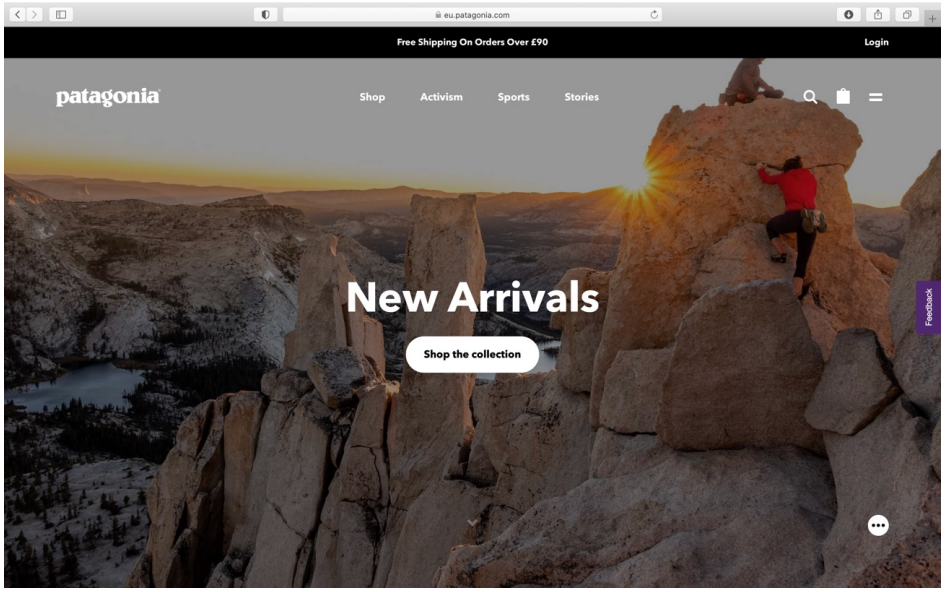


Figure 22. *Patagonia home page on 03.30.2021 (Patagonia 2021.)*

3.1.12 Peak Performance

Stefan Engström and Peter Blom founded Peak Performance in Åre, Sweden, in 1986. They were passionate skiers who quit their day jobs to make the ski gear they could not find. Peak Performance claims to combine an optimal balance of progressive Scandinavian style and performance.

Vision, mission, and philosophy

Peak Performance aims to design long-lasting garments with functional and classic styles that users are motivated to care for and repair. Peak Performance constantly works to *improve materials, processes, and design to create more performance with less impact.*[389] *Their brand mission is "to empower an active lifestyle with a combination of style and performance in commercial, high-quality, and sustainable products."*[390] Peak Performance made sustainability part of its business strategy in 2014, and this strategy considers the entire supply chain, from raw material production to the end of life.[391]

389 (Peak Performance, 2021)
390 (Peak Performance, 2021)
391 (Peak Performance, 2021)

Home page of Peak Performance in 2009 and 2021

In 2009, Peak Performance referred to freeride skiing in its header (Fig. 23). In 2021, they referred to outdoor life in general (Fig. 24).

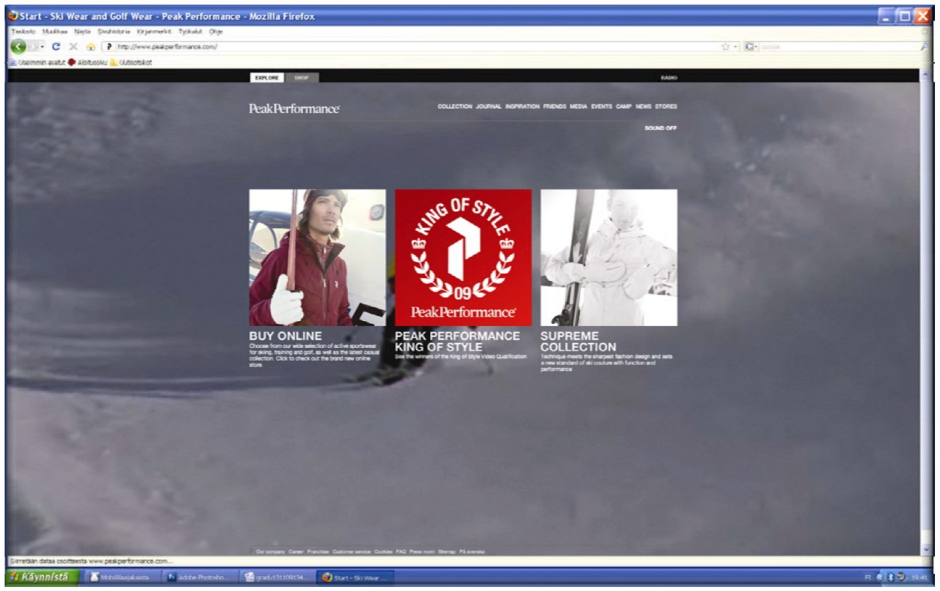


Figure 23. *Peak Performance home page on 11.13.2009 (Peak Performance, 2009; Seppälä, 2010, 122.)*

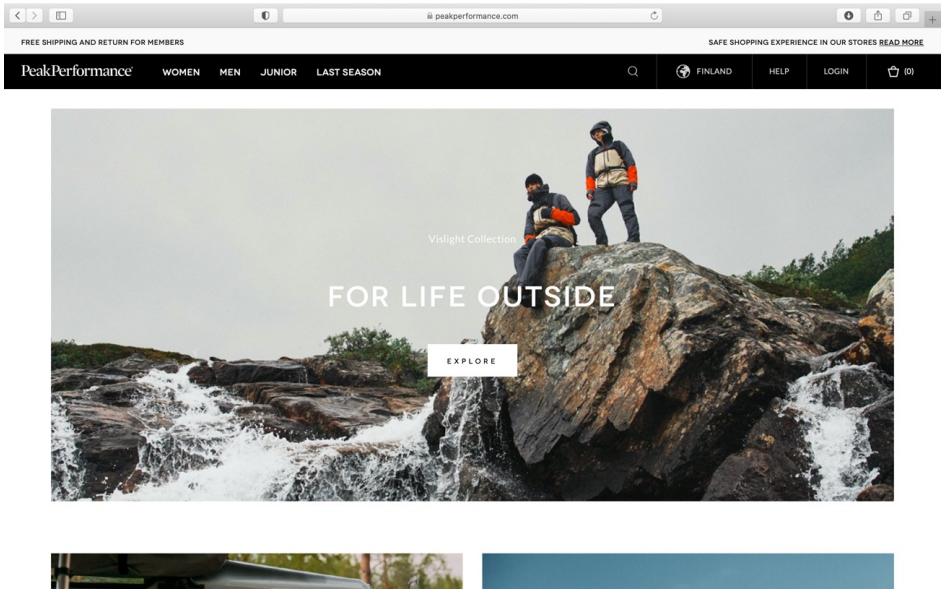


Figure 24. *Peak Performance home page on 03.30.2021 (Peak Performance, 2021.)*

3.1.13 Sierra Designs

Sierra Designs was founded in 1963. Bob Swanson and George Marks collaborated in the Ski Hut in Berkeley, United States, to create a company. In the beginning, George's mom helped in the sewing department, making the company literally a family affair.

Vision, mission, and philosophy

The company's philosophy is to offer quality gear to people for exploring the outdoors regardless of the person's background or experience level. Sierra Designs claims to have pioneered many outdoor innovations and possesses patents for these innovations.[392] Sierra Designs only mentioned social responsibility page on its website, but the company has also mentioned the environment. They believe that social responsibility is critical to their gear manufacturing. Sierra Design vigorously supports causes that improve the planet and empower people.[393] Their social responsibility policy was created in 1995 to ensure ethical practices, improvement of working conditions, and protection of the rights of workers in factories around the world where their equipment and apparel are made.[394]

392 Sierra Designs, 2021
393 Sierra Designs, 2021
394 Sierra Designs, 2021

Home page of Sierra Designs in 2009 and 2021

In 2009, Sierra Designs promoted adventures that began with purchasing its products (Fig. 25). In 2021, they highlighted their new sleeping bag (Fig. 26).

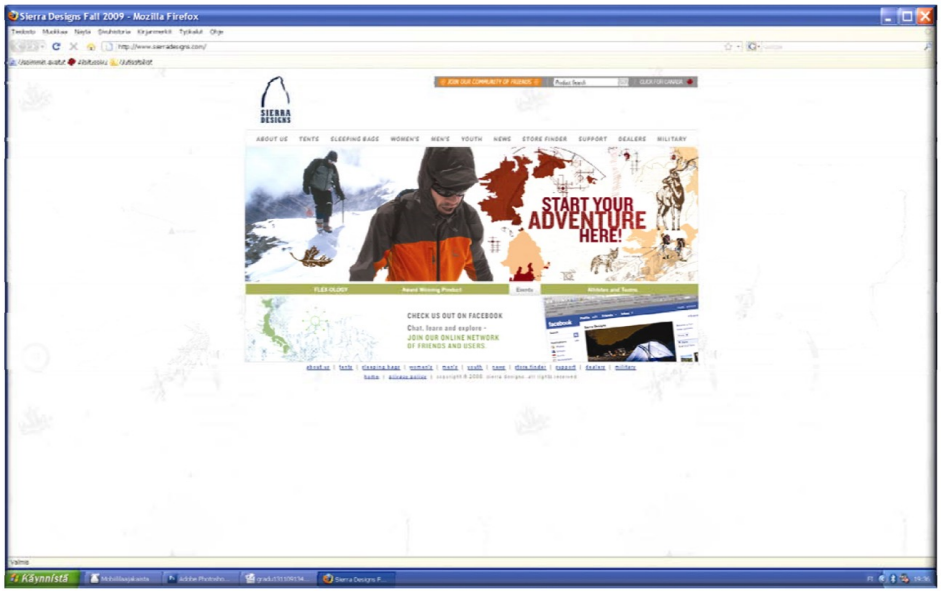


Figure 25. *Sierra Designs home page on 11.13.2009 (Sierra Designs, 2009; Seppälä, 2010, 125.)*

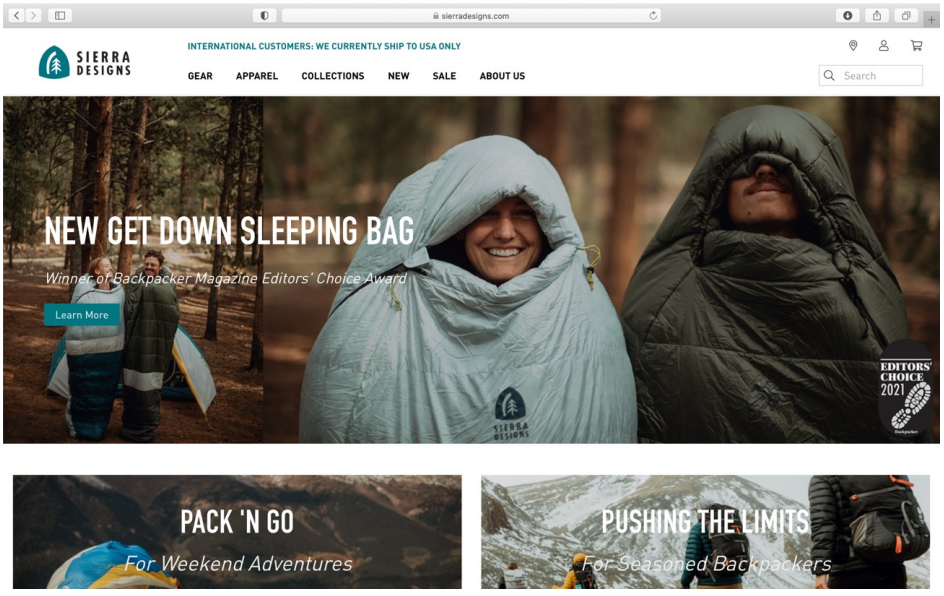


Figure 26. *Sierra Designs home page on 03.30.2021 (Sierra Designs, 2021.)*

In conclusion, only Columbia Sportswear Company and howies addressed sustainability and responsibility in their homepage header in 2021.

3.2 Qualitative research

In this section, I explain the research method of this study. I begin by providing an overview of qualitative research, and then I describe the content analysis of the internet sources. In qualitative research, results are qualified instead of quantified. Many kinds of qualitative methods and branches of qualitative study exist. However, a common denominator for all qualitative studies is an inductive view, which means that theory is created according to research, rather than research testing existing theory. Despite this commonality, qualitative research methods differ considerably, with many based on observations and interviews.[395]

Some common qualitative research methods are ethnography, focus groups, participant observation, qualitative interviewing, and language-based approaches (e.g., discourse and conversation analysis).[396] I considered these methods but concluded that they were not suitable for this study. This study is a qualitative case study because it researched 12 outdoor companies' responsibility actions in-depth and holistically. In 2018, Prasad Bhatta stated that qualitative case study methodology is adequate for a comprehensive investigation of a particular phenomenon.[397]

Collecting and analyzing texts and documents are distinct methods of qualitative research. Other types of data include photographs, video recordings, and other media. This research focused on the web page content of a subset of study participants. The data collection from companies' websites was equal for all participants. Information publicly available on companies' web pages is published and does not necessarily correlate with the truth; companies may claim that they intend to do something yet not do it. Conversely, the companies might perform actions that they do not communicate. The focus of this study was to analyze information from the point of view of an aware customer. To this end, I used public information that anybody could view and collect on the internet. This was an adequate research scope for the companies because the approach was the same for all. The study included 12 outdoor companies' websites, the same as my 2009 research.

Netnography is ethnography in an online context.[398] Robert Kozinets is one of the forerunners of netnography.[399] As the name indicates, netnography mainly

395 Bryman, 2012, 369
396 Bryman, 2012, 369
397 Prasad Bhatta, 2018, 74
398 Kozinets, 2002, 61
399 Kozinets, 2015

concentrates on human interaction in digital media.[400] Although netnography was not applicable to this study, comparable procedures and internet data were used to perform this research; netnography employs online content analysis, which this research also utilized. In 2010, Kim and Kuljis claimed that, despite its limitations, applying content analysis to web-based information is a straightforward strategy that enables researchers to conduct and assemble data at their convenience and without the need for long-lasting ethical approval.[401]

3.2.1 Online content analysis

Performing content analysis is a practice that dates back to the latter part of the nineteenth century. For example, the study of newspapers was an early use of the method.[402] Content analysis includes the systematic reading of chosen data.[403] Bernard and Ryan described content analysis as follows: *"Content analysis is a set of methods for systematically coding and analyzing qualitative data."*[404] Traditional qualitative research methods are often interactive (e.g., interviews or observation). In content analysis, however, the data exist already, without the researcher's collection.[405] Qualitative research is often case-oriented, which means it investigates particular instances.[406] In this case, qualitative content analysis was performed for 12 outdoor companies' websites.

The invention of computers radically transformed content analysis. First, computers allow many data points to be analyzed quickly. Second, online digital content can be used as data. In this research, the data were digital, and software was used for the analysis process. That certain online information can only be accessed over the internet is one of the significant shifts that has occurred over the past 20 years. The ever-evolving nature of online material, in contrast to the more static nature of traditional text publications, is the defining characteristic of the internet. Therefore, the content must be backed up, and the researcher must note the date the content was obtained. Qualitative content analysis is typically based on the researcher's perspective, which makes it comparable to textual analysis in that it is essentially interpretative in character and frequently does not make use of statistics for data analysis.[407]

Miles and Huberman (1994) identified the major phases of data analysis as follows: data reduction, data display, and conclusion drawing and verification.[408]

400 Coleman, 2010; Heinonen & Medberg, 2018; Kozinets, 2002, 2015
401 Kim & Kuljis, 2010, 287
402 Bernard & Ryan, 2010, 288
403 Krippendorff, 2004, 3
404 Bernard & Ryan, 2010, 287
405 Gray, 2009, 424
406 Schreier, 2012, 25
407 Kim & Kuljis, 2010
408 Miles & Huberman, 1994

The initial phase of content analysis is data reduction, in which all irrelevant details are excluded and essential details are emphasized. After the quantity of data has been compressed, the data are next grouped and categorized, a process also known as clustering. The third step is called conceptualization, in which overall conceptual knowledge of the topic that was researched is generated.[409]

3.3 Qualitative case study of the outdoor clothing brands

When I began my initial study in 2007, the discussion and actions regarding responsibility were vastly different. I became interested in responsibility due to fabrics that claimed to be environmentally friendly. However, I soon understood that responsibility is a broader issue than fabric choices, even though materials play a significant role when discussing clothing.

I conducted extensive research on the companies that mentioned sustainability on their web page, choosing some of the most successful outdoor companies in the field and those that mentioned sustainability. I performed initial research on these companies in 2007 and additional research on these companies' web pages in 2009 for my master's thesis. I concluded that a significant change had occurred in only three years; in 2009, all 12 companies mentioned sustainability on their website. Thus, between 2007 and 2009, the discussion on sustainability grew in prominence and became a theme in the outdoor industry.

This study is a longitudinal case study that investigates differences in the previously stated companies' communications between 2009 and 2021. The value of this case study is to determine what has occurred in the field of responsibility for these specific outdoor brands over the past 12 years. In 12 years, the status quo has shifted, and responsibility has become an expected factor. Therefore, many businesses are engaging in responsible behavior, and exploring what actions these pioneering businesses have taken is of interest. This research provides an excellent overview of the current situation to the reader. Avast body of case study knowledge exists, and each of them emphasizes an in-depth understanding of the selected cases. Although case studies are not necessarily generalizable, they provide valuable information about this phenomenon.[410]

409 Tuomi & Sarajärvi, 2018

410 Gagnon, 2010; D. R. Hancock & Algozinne, 2017; Simons, 2009; Thomas, 2010; Yin, 2008

3.4 Data analysis

Qualitative data exist in the form of words and language rather than statistics. I gathered textual data from the websites of research participants regarding their responsibility actions, and the data collection technique was straightforward. First, I captured screenshots of all websites that discussed corporate responsibility and copied the material to Word documents. The documents were then transferred to coding software for encoding. To code my data, I utilized NVivo coding software version 20.4.1 for Mac. NVivo permits code text to be placed beneath other codes and sub-codes. I also used NVivo for thematic analysis of the text. The manual coding feature of NVivo was to reason to use it for large amount of text.

I used both deductive and inductive reasoning. Deductive coding assumes that codes already exist prior to the coding process, whereas inductive coding assumes that codes emerge from the data. I created initial codes using the Sustainable Apparel Coalition Higg Index methodology. The primary categories comprised "Climate change and environmental issues," "Environmental responsibility," and "Social responsibility." I benchmarked the subcategory characteristics using the Higg Index. I also utilized inductive coding whenever the data posed a problem for which no code existed. Furthermore, I used inductive coding, for example, for "Stakeholders in the outdoor business" and "Responsibility collaboration." These five chapters follow the sequence by which I presented the literature review and findings. Both deductive and inductive coding ensures that I have accounted for all relevant data concerns and components.

Visual data were collected simultaneously with textual data (i.e., when I took screenshots of the brands' webpages). Visual material, such as pictures, communicates how the brands want users to perceive their sustainability actions. The material is visually appealing but also demonstrates different sustainability topics.

I did not use various outlined analysis possibilities. For example, an alternative approach would have been analyzing pictures in-depth considering what the brands wanted to say with the pictures. I provided visual conclusions in the results, but I did not make in-depth interpretations of the pictures. Rather, I have left this to the reader to consider. I also did not conduct an extensive discourse analysis of the text. Discourse analysis interprets the text's intention (i.e., why it is said or written). The brands likely had multiple motives behind publishing their responsibility communication, but I did not attempt to guess these motivations.

The following was the initial structure of codes:

Table 1. The initial coding themes and description of the certain concepts

CODE	DESCRIPTION OF THE CONCEPT
• **Climate change and environmental challenges**	Current state at the moment
▪ Greenhouse gas (GHG) emissions	Impact of GHG
• **Environmental responsibility**	Concepts influencing environment
▪ Materials	Fabrics used in outdoor clothing
○ Anti-odour treatments	Sweat prevention fabrics
○ Cotton	Cotton as popular natural fiber
○ Dyeing	Impacts of dyeing
○ Leftovers	Surplus fabric from clothing production
○ Microplastics	Under 5 mm particles realising from synthetic materials
○ Mosquito proof	Mosquito protecting fabrics
○ Nanoparticles	Nano technology applications in fabrics
○ Natural fibers	Natural fabrics in general
○ Organic	Organic natural fibers
○ PFC	DWR treatments with fluorocarbons
○ Polyester	Polyester as popular synthetic fiber
○ PVC	PVC as commonly used durable material
○ Recycled materials	Fabrics made of recycled materials
○ Restricted Substance List (RSL)	Prohibited chemicals
○ Synthetic fibers	Man-made materials
○ Tencel Lyocell	Specifi fiber
○ Testing	Testing of materials
○ UV protection	Ultraviolet radiation protection fabrics
▪ Product and design	Design attributes knowledge
▪ User testing	End-user testing of garments
▪ Supply chain	Supply chain related issues
▪ Packaging	Packaging of the products
▪ Use	Users' impact on sustainability
○ Care and repair	Taking care of the outdoor gear
○ Product as service	Alternatives to ownership-based business models
▪ Quality	Quality of clothing
▪ Rental	Garment rental systems
▪ Reuse	Methods of resusing garments
▪ Subscription	Subscription models
▪ Warranty	Quarantee
▪ End of use	End of life options for apparel
▪ Retail stores	Brands' stores
▪ Offices	Brands' headquarters
▪ Transportation	Methods of product and human transportation
▪ Animal welfare	Issues of animal rights
• **Social responsibility**	Concepts influencing workers' rights
• **Stakeholders in the outdoor industry**	Industry associations
▪ European Outdoor Group	Industry associations in Europe
▪ Outdoor Industry Association	Industry associations in United States
▪ Sustainable Apparel Coaliation (SAC)	Global responsibility and sustainability assesment tool
• **Responsibility collaboration**	Responsibility organizations
▪ Bluesign®	
▪ Fair Labor Association	
▪ Fair Trade Certified	
▪ Fair Wear Foundation	
▪ Forest Stewardship Council	
▪ Oeko-Tex Standard	
▪ The Conservation Alliance	

After I completed the preliminary coding, I reorganized the themes into the final order, which can be found in the next chapter. In my opinion, I was successful at simplifying a complicated phenomenon into an easily understood format.

4 RESULTS

This chapter presents the results of the study following the same organization as the literature review. The first section presents what the brands said about their outdoor clothing design. Second, the key issues affecting the outdoor clothing industry are presented, including supply chain and environmental challenges. Third, the environmental responsibility results are presented, including results on materials, animal welfare, use, and end of use. The fourth section describes social responsibility, concentrating on workers' rights in the supply chain, while the fifth section focuses on stakeholders in the outdoor industry. Last, brands' collaboration with different stakeholders is presented.

This section presents the companies' communication in alphabetical order. I first present what they said in 2009 and then in 2021. If the company or year was missing, I do not mention that topic. This makes the discussion understandable and helps make comparisons. I considered presenting the findings in different ways, one of which was sorting the results according to the seriousness of the action taken or by the order of the brands. Through my research, I realized that the approach I have taken depicts the most accurate picture possible for the reader and allows for a straightforward evaluation of the companies' approach to a given subject matter.

4.1 Outdoor clothing design

The choices at the design stage affect many sustainability issues; for example, the apparel's design features, quality, and durability influence its lifespan. This section presents findings on the brands' views on design.

2009 Arc'teryx

In 2009, Arc'teryx included environmental and manufacturing statements on their web page, and they highlighted the link between design, materials, and construction in their design philosophy (Fig. 27, Appendix 2).

Figure 27. *A collage of Arc'teryx's responsibility communication on the company website in 2009 (Arc'teryx, 2009; Seppälä, 2010, 84).*

In 2009, Arc'teryx stated that the products' quality supports environmental responsibility; raw materials and energy can be saved when the product does not to be replaced quickly. Additionally, performance properties and sound design in the form of timeless aesthetics and quality work and materials provide the product an extended lifespan.[411]

2021 Arc'teryx

In 2021, Arc'teryx still presented long-term thinking (Fig. 28). The company stated that they put their best energy into designing their gear. They wanted to build their products to last and perform well in the wildest conditions. Arc'teryx believed in building products to last and viewed that as the most powerful way to minimize their impact on the environment.[412] Arc'teryx has developed several ways to exploit the functionality and durability of its products, including choosing materials that are proven to last and designed especially for the intended purpose. Their timeless aesthetic remains contemporary, and they stated that they stand behind their lifetime care, repair, and product guarantee.[413]

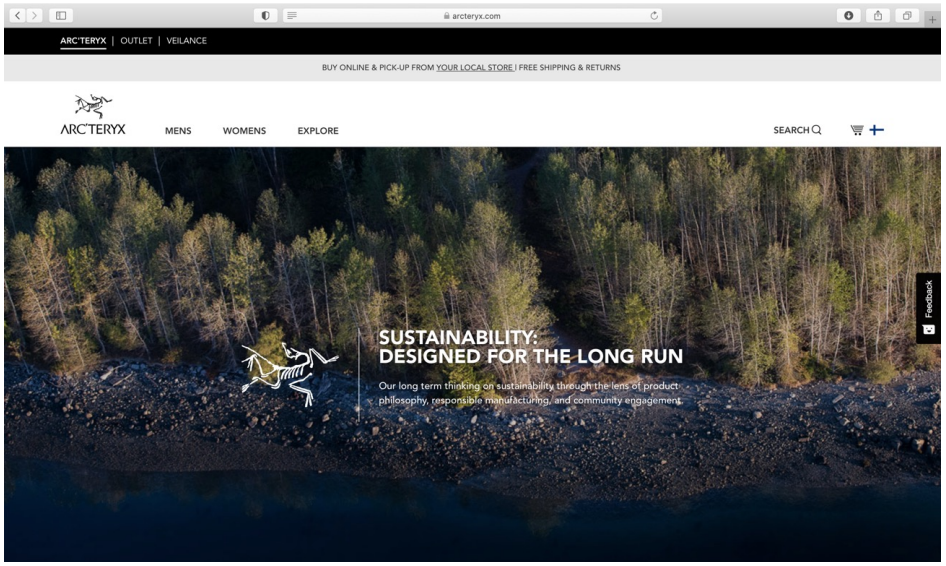


Figure 28. *Arc'teryx sustainability page in 2021 (Arc'teryx, 2021.)*

411 Arc'teryx, 2009; Seppälä, 2010, 86
412 Arc'teryx, 2021c
413 Arc'teryx, 2021c

They required their products to meet their stringent quality standards, and Arc'teryx confirmed that they work with textile mills in 10 different nations across the globe. They wanted to take pride in their suppliers and shared information about the facilities that produced each garment. Furthermore, they wanted the Arc'teryx label to provide evidence of quality, durability, and performance, regardless of the facility in which the product was manufactured.[414]

2009 Columbia Sportswear Company

In 2009, Columbia Sportswear Company provided information about its corporate responsibility on its web page (Fig. 29, Appendix 3).

Figure 29. *A collage of Columbia Sportswear Company's responsibility communication on the company website in 2009 (Columbia Sportswear Company, 2009; Seppälä, 2010, 88).*

414 Arc'teryx, 2021c

In 2009, Columbia Sportswear Company highlighted their UV protection fabric; the Skin Cancer Foundation had recommended their Omni-Shade™ apparel due to its efficient protection against the sun's damaging effects on the skin. According to the company's website, they were one of the world's leading suppliers of breathable, waterproof outdoor products at the time and were well recognized as a product pioneer.[415] In 2021, Columbia viewed innovations as enablers for social and environmental friendliness (Fig. 30).[416]

Figure 30. *In 2021, Columbia highlighted link between innovation and responsibility (Columbia Sportswear Company, 2021.)*

2009 Fjällräven

In 2009, Fjällräven provided its environmental policy on its web page. They also had sites for quality and materials (Fig. 31, Appendix 4).

415 Columbia Sportswear Company, 2009; Seppälä, 2010, 90
416 Columbia Sportswear Company, 2021b

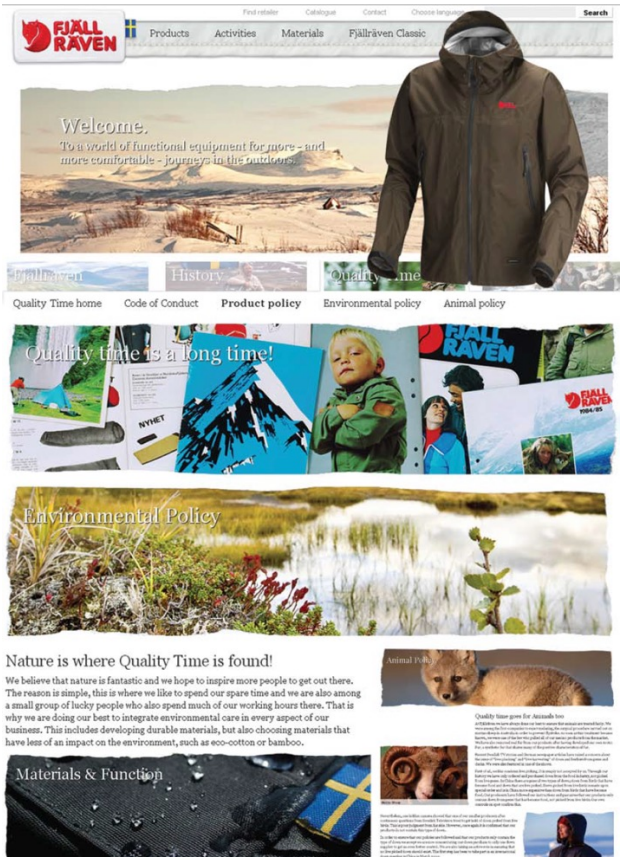


Figure 31. *A collage of Fjällräven's responsibility communication on the company website in 2009 (Fjällräven, 2009; Seppälä, 2010, 91).*

In 2009, Fjällräven had presented its quality time policy, which claimed that durable, functional, and safe products are the most environmentally friendly because they can be handed down through generations, thus saving raw material and energy. Fjällräven is famous for two classic products, the Kånken backpack and the Greenland jacket, which prove that its design philosophy can stand the test of time. They also mentioned that they think carefully about the longevity of details, such as accessories like buttons and zippers.[417]

2021 Fjällräven

Fjällräven has divided its Sustainability page into Sustainable design, Sustainable materials and Sustainable production (Fig. 32.). Fjällräven introduced its design philosophy and divided it into seven principles. They claimed that these principles

417 Fjällräven, 2009; Seppälä, 2010

guide them when making choices regarding materials and suppliers and choosing new techniques. In addition, Fjällräven stated that these principles keep them grounded and help them overcome challenging obstacles.[418]

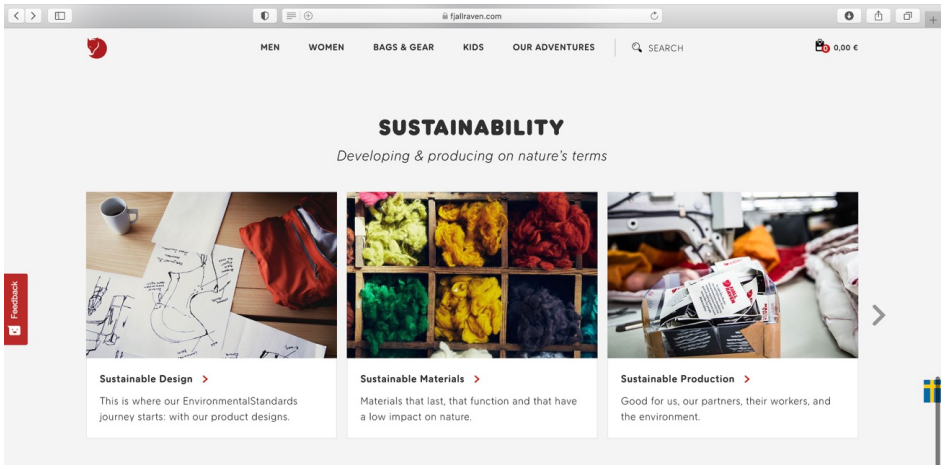


Figure 32. *Sustainability page of Fjällräven in 2021. (Fjällräven, 2021.)*

Fjällräven's sustainability website provides an illustration of the methods that must be employed when designing ecologically responsible products (Fig. 33). Regarding the creation of products, the manufacturing process, and the sourcing of materials, they use ecologically responsible procedures. Customers who are already knowledgeable about a subject are given the opportunity to further their education on that subject before making a purchasing decision.[419]

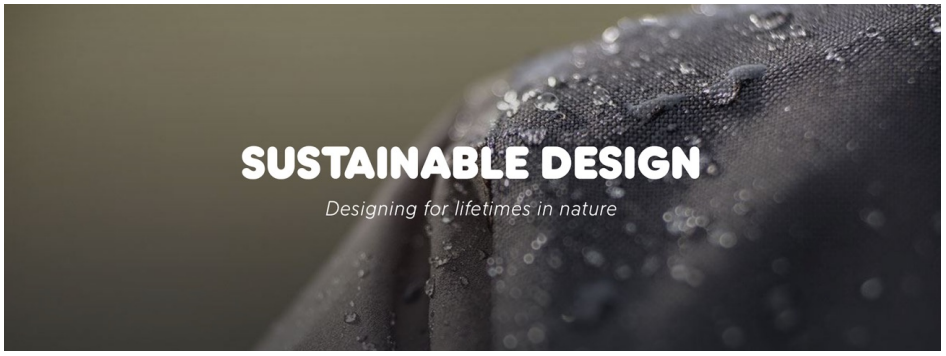


Figure 33. *Fjällräven provides its customers with extensive access to information about sustainable design. (Fjällräven, 2021.)*

418 Fjällräven, 2021b
419 Fjällräven, 2021b

Fjällräven's design philosophy principles are presented here verbatim because they cover many essential points:

- *"SIGN WITH YOU IN MIND*
  - *What you're going to be doing with our products guides our designs. Whether long-distance trekking, mountaineering or daily urban use, we look for material and style solutions that deliver what you need and expect.*
- *FUNCTION AND EASE OF USE*
  - *There's a reason we put that pocket there and shape that jacket just so. We design for different activities and environments.*
- *SIMPLICITY*
  - *Production efficiency, recyclability and style longevity all result from simple designs. So we avoid unnecessary complexity.*
- *LOW MATERIAL IMPACT*
  - *Why use a raw material when a recycled one is available and offers the same quality? Can the cut and fit be adapted to reduce waste? The type and amount of a material is a key consideration in our designs.*
- *MATERIAL LONGEVITY AND EFFICIENCY*
  - *Our products should last. It's a simple as that. On areas that will be exposed to extra wear, our designers must look for ways to make them easily reparable.*
- *EMOTIONAL LONGEVITY*
  - *It's not enough to ensure our materials last a long time. If a product looks dated in two seasons' time you won't want to wear it. So we design with timelessness in mind. We always strive to make products that become your best trekking buddies, creating relationships that grow over time.*
- *RECYCLABILITY*
  - *Although in its infancy now, we hope garment recycling will become more widespread. So we try to use just one or two materials in each product for easier future recycling.*
- *WHY CHANGE A GOOD THING*
  - *If something works and can't be improved upon, we keep it just the way it is.*
- *TRIED AND TESTED*
  - *All our products go through rigorous testing, revising and re-testing. Nothing makes it to market without long hours in the field."*

Emotional longevity, which emerges from the user's commitment to the product, is a distinct principle. Fjällräven has given in-depth thought to people's interaction with their goods and how these goods are passed on to the next generation.[420]

2009 Haglöfs

In 2009, Haglöfs had included the concept of environmental emergency on its web page (Fig. 34, Appendix 5).

Figure 34. *A collage of Haglöfs' responsibility communication on the company website in 2009 (Haglöfs, 2009; Seppälä, 2010, 95).*

Furthermore, Haglöfs stated that they aim for high-quality and long-lasting products that last over time despite changing fashion.[421]

420 Fjällräven, 2021b

421 Haglöfs, 2009; Seppälä, 2010, 97

2021 Haglöfs

In 2021, Haglöfs stated that outdoor enthusiasts must be able to trust their products because they frequently rely on them in harsh situations. Consequently, material quality and performance are Haglöfs' primary concerns. Additionally, they aim to guarantee that the environmental impact of each product is as minimal as possible. This is the driving force behind their work with materials and what motivates them to cooperate and develop.[422]

2009 Houdini

In 2009, Houdini had included an environmental commitment on its website (Fig. 35, Appendix 6).

Figure 35. *A collage of Houdini's responsibility communication on the company website in 2009 (Houdini, 2009; Seppälä, 2010, 99).*

422 Haglöfs, 2021

Furthermore, Houdini stated that they want their customers to feel well dressed without compromising performance, versatility, and reliability. They mentioned the Bauhaus movement, as well as the principle of their design philosophy: form follows function, and less is more, respectively. They highlighted design for performance and ease of movement, ensuring that the product was suitable for its intended use by, for example, ensuring that sleeves are long enough for cycling.[423]

2021 Houdini

Houdini believed in creating something that offers value to the world, both from short- and long-term perspectives. They viewed the invention, design, and development of each style as an essential long-term investment that could not be compromised.[424] Houdini stated, *"In a world of mass consumption where quantity and frequency are often prioritized over quality and good design, our design philosophy becomes something radically different."* (Fig. 36). They invested time and resources to achieve their goals since they had a clear understanding of what they wish to achieve.[425]

Figure 36. *Houdini formulated a design philosophy for creating quality and responsible products (Houdini, 2021.)*

2009 howies

In 2009, howies included a purpose statement and visual images of Do lectures on their website (Fig. 37, Appendix 7).

423 Houdini, 2009; Seppälä, 2010, 101
424 Houdini, 2021e
425 Houdini, 2021e

Figure 37. *A collage of howies' responsibility communication on the company website in 2009 (howies, 2009; Seppälä, 2010, 102).*

howies stated that higher quality would last longer, which in turn would use fewer resources and raw materials. They highlighted good quality and design, mentioning small details like stitches, buttons, and zippers, which typically break first.[426]

2021 howies

In 2021, howies claimed that from the founding of the company in 1995, its mission had been to find better, more sustainable business practices (Fig. 38.). This meant committing to utilizing more considerate textiles and manufacturing practices with reduced environmental impact. This obligation extended from the design phase through manufacturing and included the delivery of goods to the customer's doorstep, how the apparel performs, and what happens to garments when they are no longer worn.[427]

426 howies, 2009; Seppälä, 2010, 105
427 howies, 2021

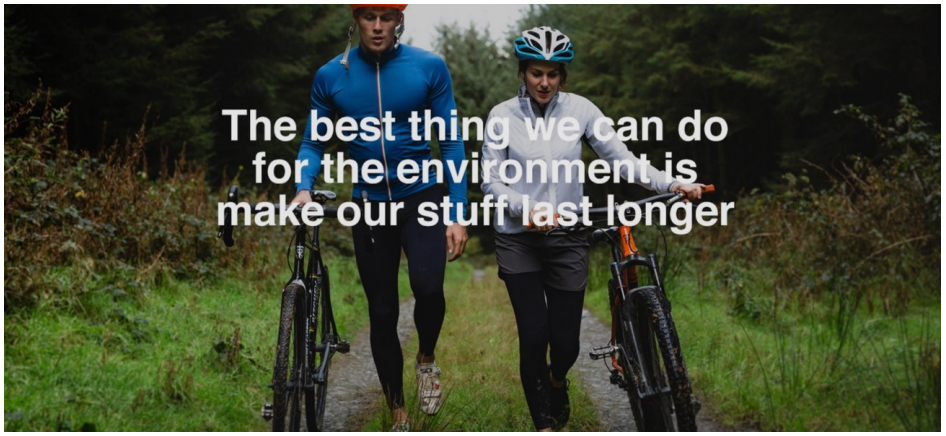


Figure 38. *The relevance of durability in relation to sustainability was highlighted by howies in 2021.(howies, 2021.)*

2009 Millet

In 2009, Millet described mountain cleanup and the Recycle-Save concept for recycling climbing ropes. Returning ropes saved money and helped the environment. Millet repurposed the ropes sent to its recycling plant to decrease fossil fuel use (Fig. 39, Appendix 8).[428]

428 Millet, 2009; Seppälä, 2010, 110

Figure 39. *A collage of Millet's responsibility communication on the company website in 2009 (Millet, 2009; Seppälä, 2010, 109).*

In 2021, Millet emphasized the importance of their products' durability (Fig. 40).[429]

Figure 40. *For extreme conditions durability is important (Millet, 2021.)*

429 Millet, 2021

2009 Jack Wolfskin

In 2009, Jack Wolfskin published its ecological and social engagements on its website (Fig. 41, Appendix 9).

Figure 41. *A collage of Jack Wolfskin's responsibility communication on the company website in 2009 (Jack Wolfskin, 2009; Seppälä, 2010, 106).*

In 2009, Jack Wolfskin stated that it strives for the highest levels of functionality and comfort in its goods and is continually developing and improving.[430] In 2021, Jack Wolfskin highlighted the importance of sustainability in their products (Fig. 42).[431]

430 Jack Wolfskin, 2009; Seppälä, 2010, 107
431 Jack Wolfskin 2021

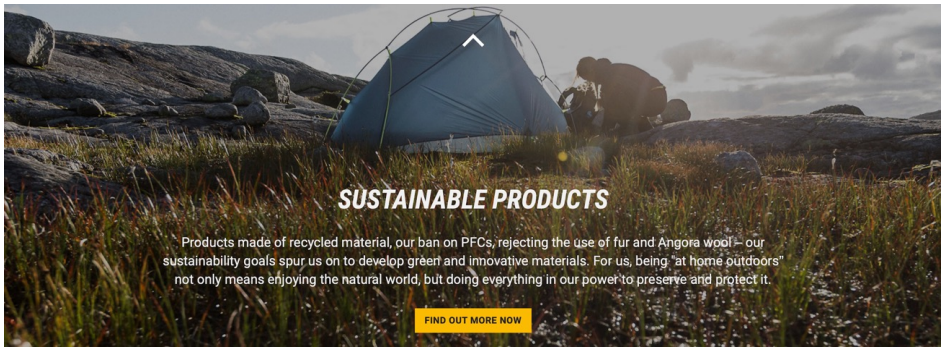


Figure 42. *Regarding the design of its products, Jack Wolfskin addressed sustainability from several angles in 2021 (Jack Wolfskin, 2021)*

2009 The North Face

In 2009, The North Face included a sustainability page on its website (Fig. 43, Appendix 10).

Figure 43. *A collage of The North Face's responsibility communication on the company website in 2009 (The North Face, 2009; Seppälä, 2010, 112)*

The company promised to supply innovative and customer-focused gear for winter sports, and their design feature list helped customers pick the best products for their needs.[432] The North Face also created an extensive responsibility section on their website (Fig. 44).[433]

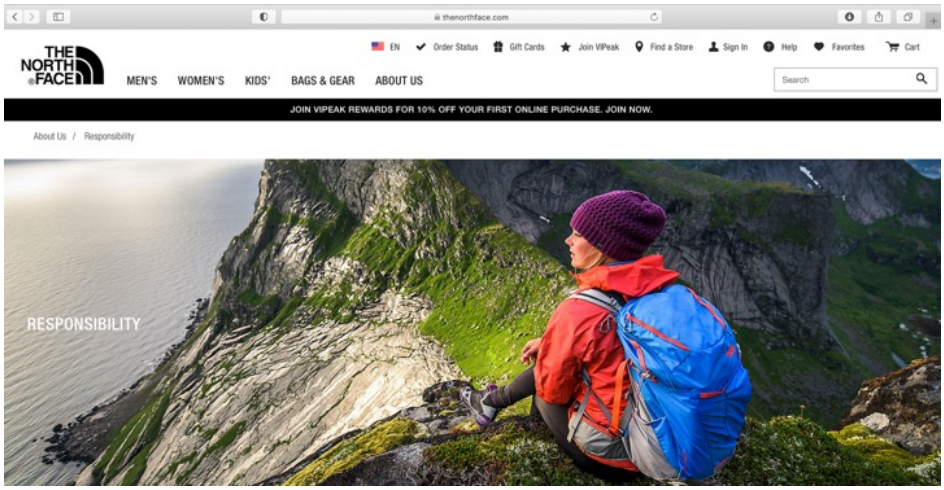


Figure 44. *Responsibility page of The North Face in 2021 (The North Face, 2021).*

432 Seppälä, 2010; The North Face, 2009
433 The North Face, 2021b

2009 Patagonia

In 2009, Patagonia had an extensive environmentalism page on its website (Fig. 45, Appendix 11).

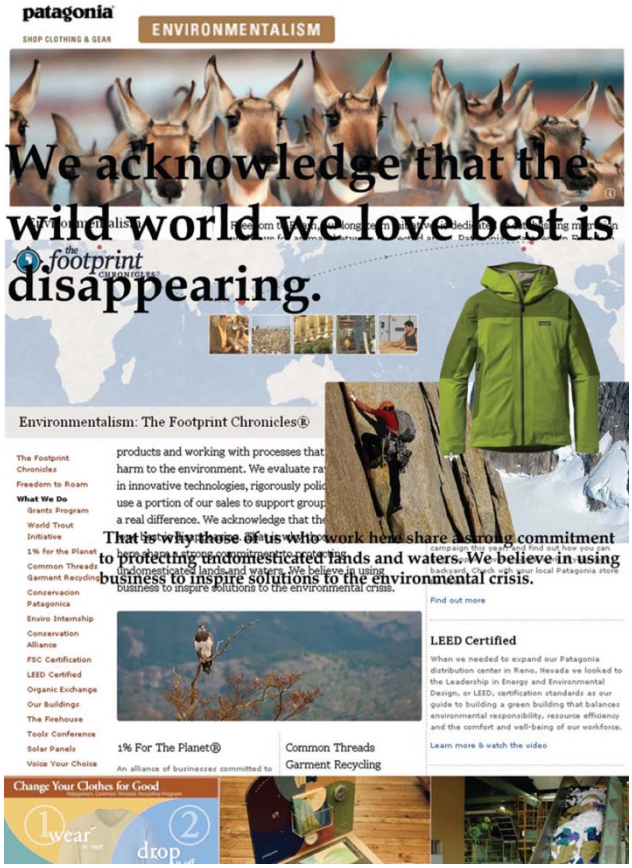


Figure 45. *A collage of Patagonia's responsibility communication on the company website in 2009 (Patagonia, 2009; Seppälä, 2010, 116).*

In 2009, Patagonia stated that they had made mistakes but had also been keen to share their knowledge with competitors. They also had a warranty system by which customers could get their product repaired, replaced, or refunded.[434] In 2021, Patagonia acknowledged that their every action impacted the planet (Fig. 46).

434 Patagonia, 2009; Seppälä, 2010, 118

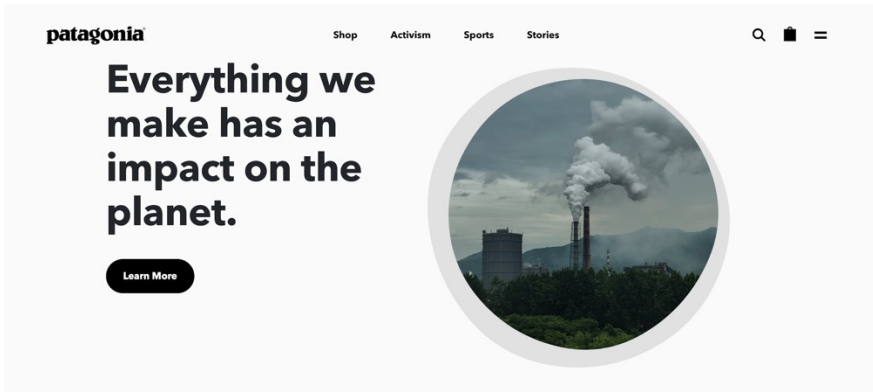


Figure 46. *Patagonia's consious statement of their business in 2021 (Patagonia, 2021.)*

2009 Peak Performance

In 2009, Peak performance included environment, ethics, and CSR information on its web page (Fig. 47, Appendix 12).

Figure 47. *A collage of Peak Performance's responsibility communication on the company website in 2009 (Peak Performance, 2009; Seppälä, 2010, 121).*

In 2009, Peak Performance's aim was to create, manufacture, and distribute world-class goods in terms of quality, functionality, and design, as guided by their beliefs and vision. They strived to produce and market durable, long-lasting items despite trend shifts. As devoted sports and outdoors enthusiasts, they wished to satisfy a variety of intellectual and emotional needs and create items that they would like to use. Peak Performance offered both active and casual lines, which were essentially interconnected.[435]

2021 Peak Performance

In 2021, Peak Performance wanted to ensure that its garments had a place in users' closets; these garments needed to be durable and able to handle weather conditions. The company also believed that apparel should stand the test of time and changing fashion. They emphasized how details like cut, fabric, function, and performance impact longevity, noting that performance is not only defined by timeless design but includes understanding challenges and utilizing resources to benefit the design. As outcomes, they began with understanding their audience, why they were designing the product, and how they intended to do so. Peak Performance stated that they worked with the industry's best fabric and trim suppliers and that the fabric quality of their products provided freedom to explore the outdoors, allowing users to focus on what matters most.[436]

2009 Sierra Designs

In 2009, Sierra Designs included a sustainability statement on its webpage: *"To us, it's about living and working in ways that don't jeopardize the future of our social, economic and natural resources."*[437] Users could also calculate their carbon footprint on their web page (Fig. 48, Appendix 13).

435 Peak Performance, 2009; Seppälä, 2010
436 Peak Performance, 2021
437 Seppälä, 2010; Sierra Designs, 2009, 126

Figure 48. *A collage of Sierra Design's responsibility communication on the company website in 2009 (Sierra Design, 2009; Seppälä, 2010, 124).*

In 2009, Sierra Designs claimed that they desired to produce quality items because they recognized that better products make outdoor activities more pleasant. They wanted their consumers to realize their personal outdoor aspirations and intended to create innovative and trustworthy products in which form followed function. Because they viewed their business as a means of delivering experiences, their purpose was to leverage their experience, mountain lifestyle, and sustainability knowledge to develop unique items that sparked excitement for the outdoor trip.[438]

This section highlighted various factors to consider when designing outdoor clothing. For example, material and style choices affect timelessness and longevity. In addition, all the companies emphasized the importance of good design and quality. Already in 2009, the companies highlighted the link between quality materials,

438 Seppälä, 2010; Sierra Designs, 2009, 126

timelessness, and sustainability. The following section presents the results on issues that affect the outdoor clothing industry.

4.2 Key issues affecting the outdoor clothing industry

All the brands had complicated supply chains that affected several aspects of environmental and social responsibility. Therefore, the results about supply chains are presented first, followed by the results on environmental challenges.

4.2.1 Supply chain

The supply chain means the whole lineage of contributors from fiber production to retail. The following results present what the brands let know about their supply chains.

2009 Arc'teryx

In 2009, Arc'teryx's 300-person domestic plant in Vancouver was responsible for design and patternmaking. Additionally, their products were manufactured in the United States, China, El Salvador, Italy, the Philippines, Taiwan, Thailand, and Bangladesh. They asserted that they utilized only SA8000 (social certification program of Social Accountability International) audited plants and that all their facilities were audited by independent auditors from Bureau Veritas. Moreover, they sent their production team to visit the factories frequently.[439]

2021 Arc'teryx

In 2021, Arc'teryx expressed the desire to be in close collaboration with production. Indeed, their office and design floor were located inside their factory for many years, and their quality design, attention to detail, and long-standing relationships with production facilities afforded them possibilities to influence the working environment of their employees.[440] This proximity to their design process, coupled with the insight they gained from their hands-on involvement in the construction of each garment, allowed them to develop a comprehensive approach to design, material selection, and construction techniques.[441]

They continued to invest in the production of technical garments and equipment in Canada, enabling their Canadian workers to manufacture high-quality goods and maintain their competitive advantage. ARC'One teaches designers how to scale production and bring unique solutions to the global market. Arc'teryx offered an

439 Arc'teryx, 2009; Seppälä, 2010, 87
440 Arc'teryx, 2021c
441 Arc'teryx, 2021c

on-site training center and partnered with local organizations ThreadWorks and Immigrant Services Society of British Columbia (ISS of BC) to teach new operators technical skills and overcome the difficulty of finding new employees (Fig. 49.). [442]

Figure 49. *Arc'teryx owns ARC'ONE, a factory located in Greater Vancouver. (Arc'teryx, 2021.)*

They had 21 manufacturing facilities in Bangladesh, Cambodia, Canada, China, El Salvador, Indonesia, Latvia, Myanmar, the Philippines, and Vietnam. They adhered to strict quality and production standards and rigorous labor practices, and they reduced their environmental impact.[443] Furthermore, Arc'teryx collaborated closely with suppliers to expand the companies and establish long-lasting (in some cases, 15-year) connections. They aimed to select manufacturers who shared their attitude toward problem-solving and the technical process, as opposed to choosing the cheapest supplier.[444] A collaboration with Arc'teryx can take up to three years to establish. They devote the first year to training the team on their methods, processes, and fundamentals of production. The subsequent year is devoted to stabilizing these systems and applying certain strategies. During the third year of collaboration with a new partner, manufacturing is scaled up.[445]

Based upon the level of development of the local garment industry, human rights, and political and sustainability considerations, the new production decision in each facility was considered critical by Arc'teryx. The consideration reflected Arc'teryx's commitment to addressing human rights issues wherever they operate. If political

442 Arc'teryx, 2021c
443 Arc'teryx, 2021c
444 Arc'teryx, 2021c
445 Arc'teryx, 2021c

circumstances were beyond their control, Arc'teryx concentrated on procedures within the facility and established jobs that favorably impacted the skilled labor force that produced their apparel.[446] They were committed to leaning into this challenge. Arc'teryx claimed that their design approach is an obsession with quality and particular attention to detail combined with their valued-aligned relationships with their suppliers. This combination creates a unique opportunity to influence and improve livelihoods for workers.[447]

Their supply chain is responsible for the majority of their environmental effect due to the selection of raw materials, textile production, and product manufacture. Additionally, they assisted their suppliers in finding efficiencies and minimizing their effect. Expanding production in British Columbia, a province with a carbon tax, provided them with further incentive to engage in energy saving projects. Arc'teryx not only utilized the Higg Index to identify areas for improvement but also shared best practices with their global production partners. [448]

2021 Columbia Sportswear Company

In 2021, Columbia Sportswear Company had an extensive section on social responsibility (Fig. 50.). As part of their commitment to improving the supply chain for women, Columbia Sportswear Company partners with Business for Social Responsibility (BSR) to provide health and financial literacy training to women in their supply chain.[449] Since 2013, in accordance with their commitment to a transparent supply chain, Columbia Sportswear Company has publicly disclosed *"a finished goods factory list."* The CSC Factory Transparency Map shows where CSC (including Columbia, Mountain Hardwear, Sorel, and prAna) products are made. They have also marked every factory and item with a factory ID for tracking.[450] By providing health and financial training and combating workplace abuse and harassment, HERproject empowers women in global supply chains. Standardization creates understanding, as results can be compared, thereby enhancing collective impact. For example, Columbia Sportswear Company seeks partners and other brands using the same factories.[451]

446 Arc'teryx, 2021c
447 Arc'teryx, 2021c
448 Arc'teryx, 2021c
449 Columbia Sportswear Company, 2021b
450 Columbia Sportswear Company, 2021b
451 Columbia Sportswear Company, 2021b

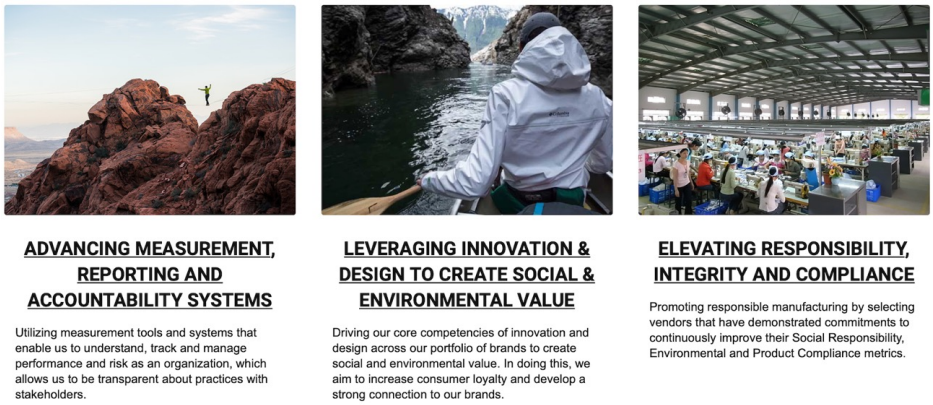


Figure 50. *Columbia Sportswear Company has focused on responsibility, integrity, and compliance in its supply chain. (Columbia Sportswear Company, 2021.)*

2009 Fjällräven

In 2009, Fjällräven issued a code of conduct to all suppliers, used SGS to audit compliance with the code, and ensured all product developers discussed environmental and social responsibility with suppliers.[452]

2009 Haglöfs

In 2009, Haglöfs had instituted a code of conduct to regulate environmental and social responsibility. This code included, among other things, safe working conditions, animal welfare, and the prohibition of child labor. They also claimed that they did not choose new suppliers without visiting their facilities and undertaking a long process.[453]

2021 Haglöfs

Haglöfs worked to ensure that every stage of its supply chain was as sustainable as possible because it did not own any production facilities. Moreover, they sought ways to strengthen the entire chain through internal skills, such as developing sustainable products "on paper" internally for translation into actual products by their suppliers[454]

To ensure the responsibility of their products, they select their raw materials, use non-hazardous chemicals, choose the best producer for the work, and work with responsible logistical partners. Additionally, they ensure that the concept and design of any materials utilized in their products are sustainable. The

452 Fjällräven, 2009; Seppälä, 2010, 94
453 Haglöfs, 2009; Seppälä, 2010, 98
454 Haglöfs, 2021

materials can be traced back to their origin, and leather originates from approved tanneries.[455]

Sustainable Choice is the company' label for more sustainable choices in their range. Moreover, members of their internal development team visit their producing mills every year to ensure a high-quality standard, check real-life working environments, and maintain good partnerships with their product suppliers.[456] Besides visits to the suppliers, the Fair Wear Foundation was vital to Haglöfs' sustainable production. It audited factories regularly, ensuring that conditions were better than acceptable for the people who worked there. They audit factories regularly, and the figures from this process are provided in the annual sustainability report for users to browse.[457]

Haglöfs does not tolerate modern slavery and works committedly to identify and eradicate slavery in every part of their supply chain, even in areas in which they have no direct relationship. The work was carried out independently and with other stakeholders, both within and outside the outdoor industry. Their owners, Asics Corporation, are widely committed to safely and sustainably creating products, and part of this commitment is the work to eradicate and prevent slavery. Consequently, Haglöfs is dedicated to the ASICS Group Modern Slavery and Human Trafficking Statement.[458]

2021 Houdini

The objective for Houdini's fabric and technology supply chain was to establish long-term partnerships with high-quality suppliers. This allowed Houdini to provide higher quality products while adhering to best practices. Furthermore, they strived to adhere to the strictest environmental, social, and moral standards. As with the partnership approach, transparency enhances trust and assesses present practices, making it easy to invest in improvement initiatives and innovation projects (Fig. 51.).[459]

455 Haglöfs, 2021
456 Haglöfs, 2021
457 Haglöfs, 2021
458 Haglöfs, 2021
459 Houdini, 2021e

Figure 51. *Houdini openly reveals its supply chain. (Houdini, 2021)*

The majority of Houdini's global supply partners were located in EU nations, and most of their textiles were produced in industrialized nations where strong social standards, severe environmental regulations, and government control responsibilities are imposed by law.[460] Houdini was proud to display the origin of its garments and fabrics on its website. Houdini saw that producing locally in Europe had numerous advantages. Houdini was committed to ensuring that all stakeholders are transparent and believed that manufacturing should be a social good. The ultimate objective of Houdini was to transfer its high social standards and practices to the worldwide market by selecting partners who share these values.

2009 howies

In 2009, howies discussed environmental problems publicly on their websites, noting that responsibility issues are difficult to resolve. They pondered many supply chain-related inquiries, such as *"How can the factory's air quality be measured? Which chemicals are beneficial? What chemicals are toxic? How much overtime is allowed? How many days of vacation should be provided?"* They desired to determine the answers to these questions and ensure that their factories complied with their fundamental principles for conducting business with little environmental impact. They also solicited user input for suggestions on improving their services. Moreover, they committed to donating 1% of their revenue, or 10% of their pre-tax income, to grassroots environmental and social programs. Although they considered this a minor donation, they expect to offer more as their firm expanded. Their objective was to develop gradually to strengthen the firm. Likewise, they attempted to balance work and leisure, stating that, if a beautiful

460 Houdini, 2021e

day were to arrive, it would be a pity to waste it; therefore, their employees were allowed to head outside.[461]

2021 Jack Wolfskin

Transparency was essential for Jack Wolfskin, and they published a list of their raw materials suppliers and manufacturers. Thus, users could trace the supply chain process on Jack Wolfskin's transparency page using a unique label on the products. Jack Wolfskin was a bluesign® system partner because they wanted to ensure secure, responsible production. bluesign® system collaborates with its suppliers for chemical safety. Consequently, Jack Wolfskin knew who was manufacturing which items for them and whether suppliers adhered to their environmental and social standards. If Jack Wolfskin detected problems, they collaborated with suppliers to fix the problems. They divided their suppliers into three categories to indicate the level of sustainability in their manufacturing processes: gold, silver, and bronze. For this rating, an independently certified chemical management system was implemented to ensure that chemicals harmful to human health or the environment were banned. Jack Wolfskin shared the results of checks made on fair working conditions and wastewater tests so that interested parties could track the company's goals and identify their progress (Fig. 52.).

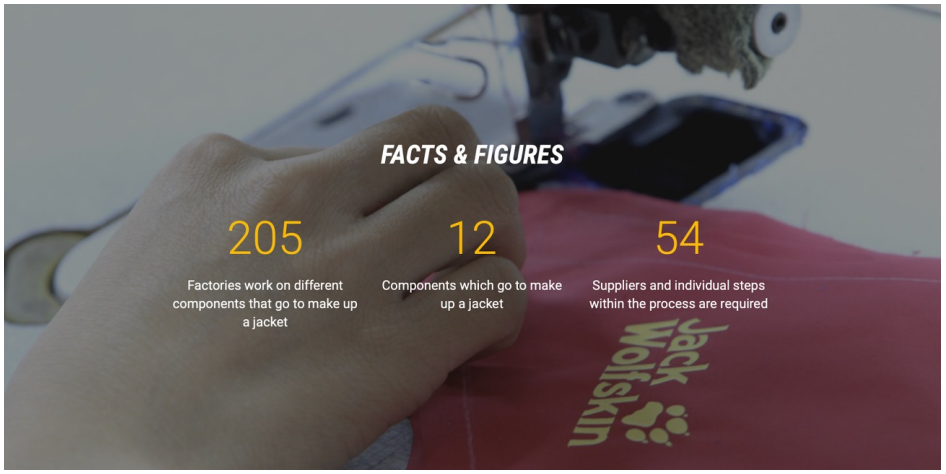


Figure 52. *Jack Wolfskin claimed to have over two hundred suppliers. (Jack Wolfskin, 2021.)*

461 howies, 2009; Seppälä, 2010, 105

2021 Millet

Millet claimed environmental and social responsibility, including responsibility for people in their partners' factories (Fig. 53.). They owned one factory in Turkey and Hungary, where 22% of their products were made in 2020. Millet used the SEDEX SMETA auditing format, which has four aspects: labor, health and safety, business ethics, and environment. Additionally, SEDEX SMETA follows the United Nations Guiding Principles (UNGP) regarding human rights in supply chains. According to Millet, 75% of their production chain had been verified, and the remaining 25% were in process.

They were also committed to transparency, preferring to move their industrial operation as close to their French headquarters as possible. This ensured their plants were responsive, more transparent, and able to reduce unnecessary transportation.[462]

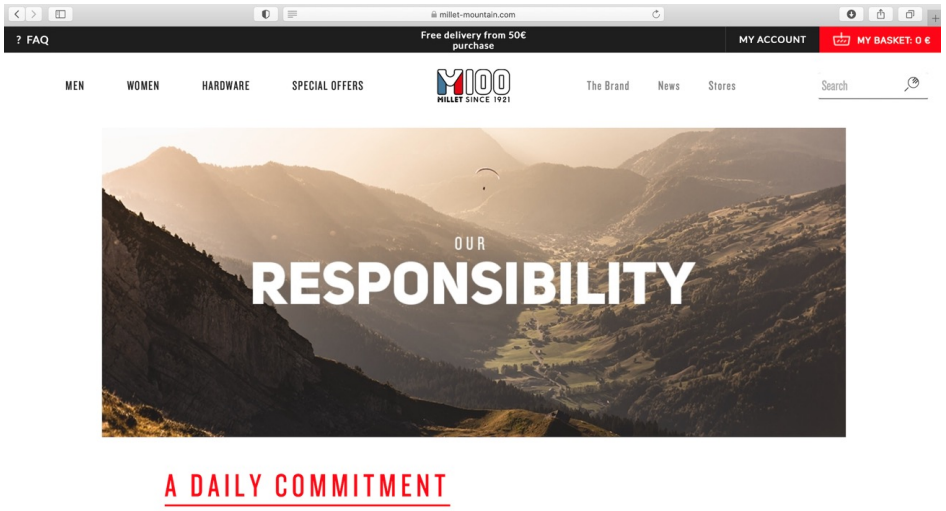


Figure 53. *Millet's website described its responsibility commitments and revealed its supply chain (Millet, 2021)*

According to Millet, 23% of their collection was made in Europe, and the company planned to increase that percentage. Furthermore, their impact on the environment determined the modes of transportation they used, such as Asian sea freight.[463]

2021 Patagonia

The Patagonia Supply Chain Environmental Responsibility Program decreased

462 Jack Wolfskin, 2021d
463 Millet, 2021

the environmental impact of their manufacturing. Their program encompassed chemicals, water use, water emissions, energy consumption, greenhouse gases, other air pollutants, and trash at supplier facilities globally (Fig. 54.).This program employed the Higg Index and third-party certification systems, such as bluesign®, to measure supplier performance. Suppliers were asked to exceed the program's basic criteria to be responsible.[464]

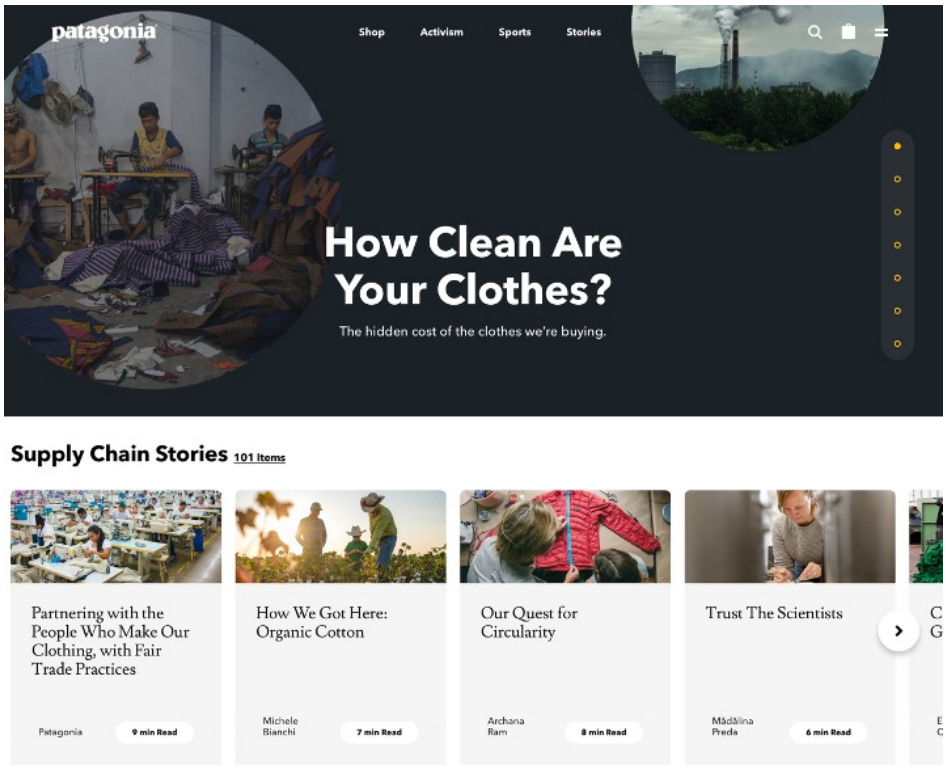


Figure 54. *Patagonia increased awareness of a responsible supply chain (Patagonia, 2021)*

As Patagonia has learned more about suppliers' facilities and partnered in training and renovations, they have reduced the environmental impacts of their supply chain. Some supplier facilities had wastewater and air-emission systems that surpassed Patagonia's stringent international criteria. Other facilities eliminated harmful substances and implemented safe chemical management techniques. Patagonia did not accept suppliers who could not meet its criteria.[465]

464 Patagonia, 2021h
465 Patagonia, 2021h

2021 Peak Performance

Peak Performance developed its supply chain by creating long-lasting and substantial collaborations. Their partners were carefully chosen based on their commitment to sustainability. They ensured that they were working toward delivering significant, long-term results for the organization and its suppliers. They worked with their suppliers annually to enhance their sustainability comprehension, improve performance, and assisted with challenges.[466]

Following are their responsibility guidelines:

> *"Supplier management*
>
> - *Rigorous onboarding procedure with stringent quality requirements and review of social compliance*
> - *Thorough contracting and compliance process*
> - *Continuous cooperative performance development*
> - *Systematic and strategic segmentation of suppliers*
>
> *Supplier partnership*
>
> - *Frequent, ongoing in-person interaction*
> - *Partner rewards with true dedication to relations and brand*
> - *Maintaining deep and genuine relationships*
> - *Share growth plans and commit to business plans"*

Peak Performance appreciated its suppliers because they produced quality products, offered innovation capacity contracts, and conducted responsible business. Additionally, Peak Performance had been associated with them for more than three years and, for some, more than 15 years.[467]

The company worked primarily with 16 suppliers who were fully approved and audited by their business for at least one year. These suppliers had established good relationships with the business and had been partners for more than a year, meeting quality, compliance, and delivery expectations. Thus, Peak Performance had developed a strategic partnership with these preferred suppliers.[468] Peak Performance collaborated with 33 suppliers in 46 sites located in several countries. According to Amfori BSCI, nearly 100% of their production occurs in high-risk

466 Peak Performance, 2021
467 Peak Performance, 2021
468 Peak Performance, 2021

nations, yet they monitor their footprint and human rights threats in each of their supply countries.[469]

This section revealed that one of the key aspects concerning supply chains is long-term partnerships with suppliers. Following 2009, a trend started to emerge in which a number of brands made their supply chains public for users to investigate. The following section concentrates on environmental challenges.

4.2.2 Environmental challenges

Some factors that cause environmental challenges are climate change, water usage and contamination, chemicals, asset stripping, and waste. Additionally, transportation and offices influence the environment. This section concentrates on those factors that the brands mentioned, starting with climate change, an emerging issue.

Climate change

Climate change, caused by greenhouse gases, impacts humans and the entire planet. This section presents the findings concerning climate change and how the brands approached it. According to my 2009 study, only one company discussed climate change on their website: Haglöfs. The topic has since received a great deal of attention, with outdoor companies acknowledging its seriousness. All production and transportation cause greenhouse emissions. However, the companies had different ways of assuming responsibility for these emissions. According to my study, greenhouse gas emissions were not mentioned in 2009.

2021 Arc'teryx

Arc'teryx declared that limiting warming to 1.5 °C requires net-zero emissions around 2050 to prevent catastrophic and irreversible climate change. They stated that: *"Climate change is an urgent issue with immediate impacts to communities and ecosystems around the world."*[470] Arc'teryx stated that balancing climate impacts with business success is their biggest challenge. They belonged to the UN Fashion Industry Charter for Climate Action and the Outdoor Industry Association's Climate Action Corps. Additionally, they founded the Catalyst Business Coalition to meet the Paris Agreement targets for scaling low-carbon solutions.[471] Furthermore, Arc'teryx made emission and renewable energy goals and published them on Earth Day 2020. The science-based initiative approved Arc'teryx's targets. The initiative partnered with CDP, UN Global Compact, the World Resources Institute, and WWF to help companies keep global temperature increases below 2 °C.[472]

469 Peak Performance, 2021
470 Arc'teryx, 2021c
471 Arc'teryx, 2021c
472 Arc'teryx, 2021c

Arc'teryx aimed to reduce its carbon emissions by 65% from 2018–2030. This goal included emissions related to their products, factories, mills, shipping, and distribution centers. Moreover, they chose low-impact materials and continued to design for long-lasting durability so that their goods could remain in use for as long as feasible.[473] Arc'teryx worked with environmentally friendly renewable energy and focused on achieving 100% renewable energy and energy efficiency. Additionally, Arc'teryx expanded its participation in the circular economy through the sale of pre-owned equipment. Their objective was to develop an operational model with minimal emissions.[474]

2021 Fjällräven

Fjällräven knew they could not eliminate their emissions, so they compensated for some of their products and business travel. Fjällräven worked with UN verified, Gold Standard renewable energy projects to compensate for their emissions. Gold Standard is an independent quality assessment for CO_2 emission reduction projects. Sixty non-profit organizations, including Greenpeace International and WWF International, supported Gold Standard. Fjällräven's target was to become carbon neutral by 2025.[475]

2009 Haglöfs

In 2009, Haglöfs claimed, "*We need to take care of our surroundings because we are running out of the planet.*"[476] They stated that climate change concerns an increasing number of people, who should consider how to deal with the problem. They admitted that they were a minor actor from a global perspective but were willing to do their part.[477]

2021 Haglöfs

In 2021, Haglöfs worked to continue reducing their CO_2 footprint, carbon-compensating their travels, and spreading the word about climate change. Haglöfs highlighted the importance of partnership to reach these goals. They partnered with external experts in climate compensation for internal logistics as well as researchers to phase out all fluorocarbon-based water repellent treatments.

Haglöfs mentioned the COP21 UN Climate Change Conference on their web page, which occurred in Paris in 2015. They also mentioned the United Nations Sustainable Development Goals and listed some actions they had made toward achieving these goals. Haglöfs acknowledged that their products leave an imprint on the world. However, they were determined to minimize their impact on people

473 Arc'teryx, 2021c
474 Arc'teryx, 2021c
475 Fjällräven, 2021b
476 Haglöfs, 2009; Seppälä, 2010, 97
477 Haglöfs, 2009; Seppälä, 2010, 97

and the planet. To do so, they focus on producing high-quality products with a long lifespan. They presented several contributions to lessen their total impact, but they also recognized that more work was needed.

Haglöfs created Sustainable Choice to provide an environmental responsibility label and help consumers identify products with the least environmental impact. The Sustainable Choice symbol highlighted products that achieved the most sustainability efforts, significantly impacting workers, the supply chain, and the environment. Sustainable Choice allowed retailers to provide a collection with a reduced environmental impact. Additionally, the label provided information to help consumers make sustainable purchasing decisions.[478]

They collaborated with their partners on all logistics to enhance sustainability. Haglöfs was conscientious of the impact of climate change on people's daily lives. Therefore, they restricted air cargo as much as possible and utilized rail cargo whenever possible. Due to the lack of EU rail solutions from China and other countries, they also utilized sea shipments.[479] Haglöfs took responsibility for both large and small operations. They mentioned logistics planning, high-tech factory production, business travel rules, corporate automobiles, conference and meeting sites, recycling initiatives, and organic fruit in all offices.[480]

Haglöfs also implemented a policy mandating that all its offices, warehouses, and retail locations in Sweden use renewable energy sources, such as wind, water, and biomass. Additionally, they actively pursued energy-saving techniques and actions. According to their policy on sustainability, travel should be conducted using the mode of transportation with the smallest environmental impact. Since 2016, restrictions for the CO_2 emissions of company automobiles have become more stringent.[481]

2021 Jack Wolfskin

Jack Wolfskin utilized 100% green electricity, a portion of which was self-generated. They focused on renewable energy and minimizing their electricity consumption. Since 2012, they had converted all Jack Wolfskin locations in Germany, Austria, and Switzerland to green electricity.[482] For business travel within Germany and neighboring countries, Jack Wolfskin preferred traveling by train. To calculate the most economically and environmentally appropriate transport plan, Jack Wolfskin decreased its use of airfreight in favor of sea freight. For example, they transported 90% of their incoming global freight, accounting for most of their total CO_2 emissions, by sea.[483] Jack Wolfskin also used live video conferencing instead

478 Haglöfs, 2021
479 Haglöfs, 2021
480 Haglöfs, 2021
481 Haglöfs, 2021
482 Jack Wolfskin, 2021d
483 Jack Wolfskin, 2021d

of traveling by plane. As a result, they sent fewer but larger consignments daily, reducing the number of journeys and the demand for packaging material. Moreover, their employees used company bicycles or power-assisted bikes that used 100% green electricity from the hub on their premises.[484]

2021 The North Face

According to The North Face, its sponsored athletes travel to isolated locations, such as the Himalayas, where they have seen the consequences of climate change. As a result of receding glaciers and melting permafrost due to global warming, the winter ski season had changed drastically. Furthermore, more disasters like fires and floods are occurring because of climate change, which the majority of experts think is caused by humans and is harming the planet.[485]

The North Face believed that addressing climate change is good for the planet and business. They were dedicated to lowering their carbon footprint by installing solar panels at their facilities and implementing energy-saving techniques in their textile mills. Moreover, The North Face assumed a long-term perspective on operational impacts and environmental concerns.[486] In 2009, The North Face joined Ceres Business for Innovative Climate and Energy Policy, a group of businesses committed to addressing climate change. They continued to support the Paris Climate Agreement and were committed to reducing their energy footprint. Additionally, they compensated for emissions they had yet to eliminate.[487]

Since 2007, they had offset 100% of their business travel and employee commuting emissions. Furthermore, by planting around 37,000 trees in the lower Mississippi region and protecting California's redwoods, they removed nearly 48,520 metric tons of CO_2 from the atmosphere.[488] Indeed, planting trees provides significant environmental benefits, such as trapping carbon and reducing carbon emissions. In 2018, The North Face began compensating for the carbon emissions of its athletes' expeditions by planting trees at Marais des Cygnes National Wildlife Refuge in Kansas.[489]

The North Face was recognized by the Environmental Protection Agency in the USA for its efforts in reducing climate change. For offsetting 100% of their energy use, they received Green Power Leadership Awards in 2012 and 2013, the highest honor the EPA gives. The North Face also partnered with Hot Planet/Cool Athletes to educate their customers on climate change and promote green power usage.[490]

484 Jack Wolfskin, 2021d
485 The North Face, 2021b
486 The North Face, 2021b
487 The North Face, 2021b
488 The North Face, 2021b
489 The North Face, 2021b
490 The North Face, 2021b

2021 Patagonia

Patagonia stated that the climate crisis is intensified by the harvesting and processing virgin materials (Fig. 55.). As a result, they strove to use raw materials that were 100% renewable and recycled.[491]

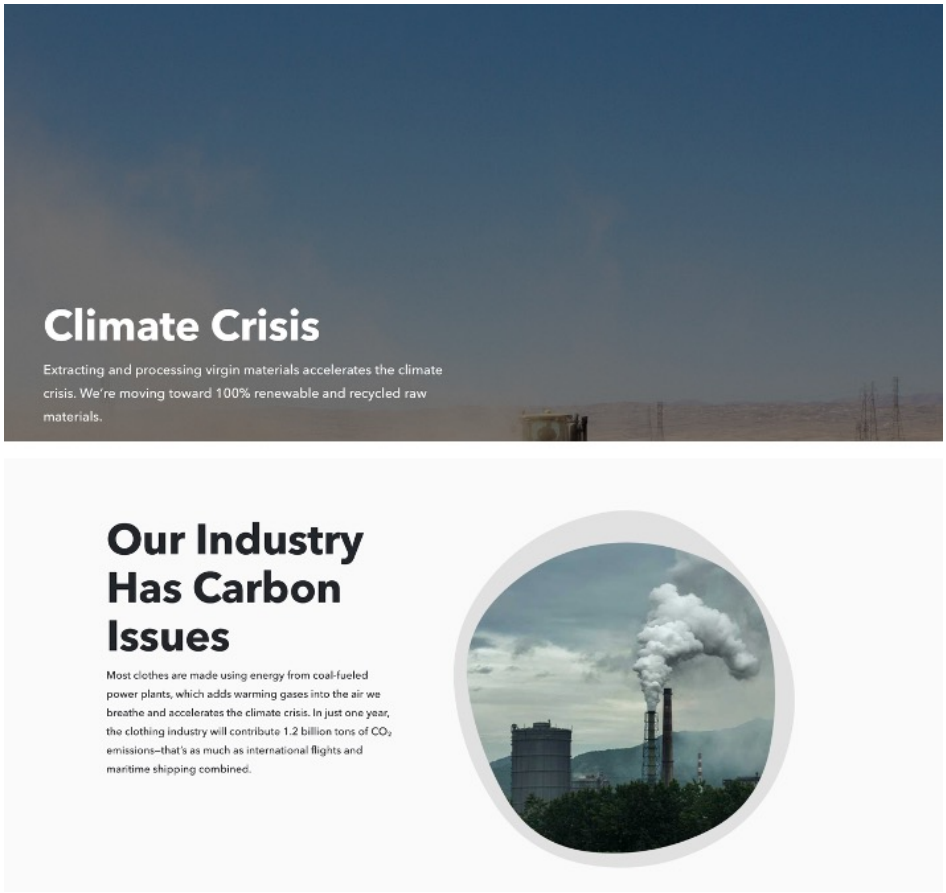


Figure 55. *Patagonia emphasized the issues of the apparel business, such as transportation and energy use, on climate change. (Patagonia, 2021.)*

2021 Peak Perforance

Climate action through products and services was an essential priority for Peak Performance. Their most significant impact comes from production, and they stated that becoming more sustainable was an active choice they must make daily. They were committed to reducing their carbon footprint by writing policies or

491 Patagonia, 2021k

outsourcing reports, measuring their impact, evaluating the results, and setting new targets. To that end, they joined the Swedish Textile Initiative for Climate Action.[492]

The Ellen MacArthur Foundation (EMF) forecasted that the garment industry will be responsible for 26% of the global carbon budget by 2050 if it follows its current growth and impact trends. As a result, Peak Performance asserted that an approach of "business as usual" is irresponsible and short-sighted. Therefore, the sector must do more than cut its emissions; it must take a direct approach to those aspects of its value chain that have the most significant impacts. These primarily include the production of raw materials, processing along the supply chain, assembly, transportation, customer product care and disposal, and transportation.[493]

This section revealed that some outdoor companies take their greenhouse gas emissions seriously and have taken action to lessen them. One of the actions was considering transport and energy sources. As a result, the discussion on climate change and greenhouse gas has developed since 2009. Several brands acknowledged the importance and seriousness of climate change in 2021 and delivered good information about it on their websites.

Transportation

Transportation is an essential part of the supply chain that causes greenhouse gases, emissions, and packaging waste. Additionally, employees' business travel and daily work travel impact greenhouse gas emissions. This section presents the brands' comments on transportation.

2009 Arc'teryx

In 2009, Arc'teryx provided its employees with assistance for taking public transportation or riding bicycles to work by providing discounts on passes for public transportation and servicing rooms for bicycles. Furthermore, they encouraged working flextime to prevent employees' sitting in traffic or allowed them to work from home.[494]

2009 Columbia Sportswear Company

Columbia employees were encouraged to carpool through the provision of guaranteed parking, and discounted permits were offered for public transportation in 2009. In addition, they provided showers for riders and bike racks for employees to store their bikes.[495]

492 Peak Performance, 2021
493 Peak Performance, 2021
494 Arc'teryx, 2009; Seppälä, 2010, 87
495 Columbia Sportswear Company, 2009; Seppälä, 2010, 90

2009 Haglöfs

In 2009, Haglöfs avoided transport via aircraft, and staff were encouraged to find more environmentally responsible modes of transportation.[496]

Offices and retail stores

Offices and retail stores have various environmental impacts, depending on their energy sources, selected materials, and waste management. This section presents the results on these topics.

2009 Arc'teryx

In 2009, Arc'teryx worked with a third-party auditor, Wisent Environmental Inc., who inspects companies' headquarters, manufacturing sites, and storage areas. Additionally, Arc'teryx stated in their 2009 press release that they had their catalogs printed by Hemlock Printers Ltd., who was recognized as the most environmentally progressive printing company in Canada at the time. They also stated that they recycled all waste from the office and utilized paper made from recycled post-consumer materials.[497]

2009 Columbia Sportswear Company

In 2009, Columbia Sportswear Company stated that they recycled their office waste, used recycled paper, and printed with soy-based inks.[498]

2021 Jack Wolfskin

Jack Wolfskin minimized packaging waste where possible. They also avoided unnecessary plastic and cardboard, although eliminating their protective packaging for shipping was not possible.[499] They removed plastic bags from their stores and instead provided sturdy, reusable bags. Their hang tags were made from FSC-certified paper. Moreover, they intended to change plastic transport packaging to 100% recycled bags over time. They banned hazardous substances from their supplier packaging, and they aimed to optimize the frequency of deliveries to their stores through fewer, larger consignments delivered daily.

2009 The North Face

The North Face North American offices used 100% wind energy, and their office in Canada was an LEED_CI certified office. They also collaborated with EPA Climate Leaders Program to reduce their overall carbon footprint.[500]

496 Haglöfs, 2009; Seppälä, 2010, 98
497 Arc'teryx, 2009; Seppälä, 2010, 87
498 Columbia Sportswear Company, 2009; Seppälä, 2010, 90
499 Jack Wolfskin, 2021d
500 The North Face, 2009; Seppälä 2010, 115

2009 Patagonia

Patagonia has used recycled paper in their offices since the mid-1980s. They have also used other recycled materials in their offices, as well as energy-saving lights. Furthermore, they highlighted that sustainability is every employee's responsibility.[501]

In conclusion, these outdoor companies acknowledged that climate change and environmental challenges exist, and they were working toward a solution. However, they also recognized that production always has consequences.

4.3 Environmental responsibility

Environmental responsibility is a massive topic, and outdoor clothing is affecting the environment in various ways. One significant effect extends from materials, yet material selection can be confusing. For this study, I focused on the materials highlighted by the outdoor companies, as well as the challenges they discussed. For example, topical hazardous chemicals and restricted substance lists become stricter when information increases. However, material selection is not the only factor of environmental responsibility. This section presents the results of various aspects of the life cycle, from design to end of life. Animal welfare is one prominent issue whose standards rise all the time and are critical for avoiding bad publicity.

4.3.1 Materials

Because clothing is produced from materials, mainly fabric and accessories, they play an essential role in the sustainability footprint of the clothing. Therefore, I present here the companies' communications about their material responsibility and then offer information about individual selected materials.

2009 Arc'teryx

In 2009, Arc'teryx stated that they did not want to compromises the technical performance of their products. However, they admitted that they had not successfully found a viable and acceptable alternative. Arc'teryx asserted that the results of their tests demonstrated that renewable materials do not possess the same level of strength as virgin fibers. Moreover, they mentioned the possibility of making exceptions for wool products and casual clothing.[502]

2021 Arc'teryx

Arc'teryx was dedicated to assuring the highest product quality and performance by implementing a materials compliance program, which included sourcing raw material

501 Patagonia 2009; Seppälä 2010, 120
502 Arc'teryx, 2009; Seppälä, 2010

safe for both humans and the environment. To achieve their intended functions, levels of performance, and levels of durability, technical outdoor fabrics rely on active chemistry (Fig. 56.).[503] Arc'teryx was committed to environmental sustainability and had thus adopted the bluesign® system. This system describes a wide variety of materials that must be carefully managed due to concerns over both the environment and human health. Furthermore, Arc'teryx had formed partnerships with the companies that provided their materials to guarantee that the RSL requirements and recommended procedures were followed across their entire supply chain.[504]

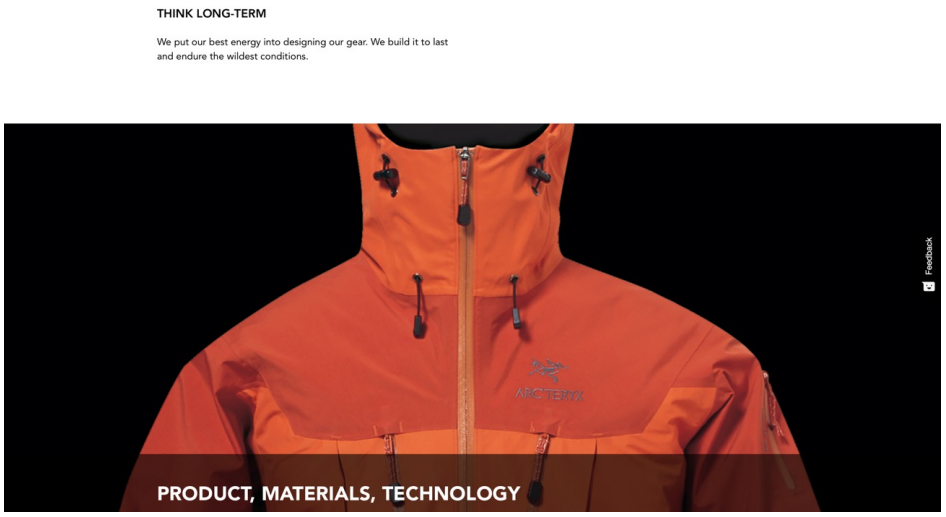


Figure 56. *Arc'teryx was exceedingly selective in its selection of materials. (Arc'teryx, 2021)*

As a partner in the bluesign® system, they concluded that concentrating on sourcing safer inputs for their products was more important than attempting to manage the outputs. Their five primary areas of concentration were as follows: *"resource productivity, consumer safety, water emissions, air emissions, occupational health and safety."*[505]

2009 Columbia Sportswear Company

In 2009, Columbia mentioned their brand names for waterproof and wicking fabrics and UV protection fabric, but I did not find any remarks about the responsibility of their fabrics.[506]

503 Arc'teryx, 2021c
504 Arc'teryx, 2021c
505 Arc'teryx, 2021c)
506 Columbia Sportswear Company, 2009; Seppälä, 2010, 90

2021 Columbia Sportswear Company

Columbia considered determining and tracking the origin of the materials used in its manufacturing processes necessary. They wanted to ensure that the resources came from the reported sources and that the supply chain for responsible sourcing was verified by a credible certification. Their materials tracing program enabled them to track the manufacturing of finished items and ensured that all their products could be traced to their origins.[507] Moreover, the minerals used in their products were sourced from approved suppliers and were tested and confirmed for ethical sourcing along the supply chain. Due to difficulties with forced labor, they also demanded that their suppliers avoid purchasing cotton from Uzbekistan and Turkmenistan.[508]

2009 Fjällräven

In 2009, Fjällräven mentioned three separate responsibility actions regarding materials selection. They claimed materials with durability and longevity reduced new material production, chemical use, and transport. They also mentioned animal rights and avoiding using down that had been live-plucked from geese. Finally, they adopted Teijin's Eco circle system, which allowed them to collect products and recycle polyester. Fjällräven claimed that the quality of their fabric remained the same.[509]

2021 Fjällräven

According to Fjällräven, the sustainability of a garment was irrelevant; if a shell material did not keep the wearer dry, they would not consider it. Fjällräven required a balance between material functionality and environmental impact (Fig. 57.). Organic, renewable, recyclable, and durable materials were utilized when possible.[510]

507 Columbia Sportswear Company, 2021b
508 Columbia Sportswear Company, 2021b
509 Fjällräven, 2009; Seppälä, 2010, 94
510 Fjällräven, 2021b

Figure 57. *Fjällräven's sustainable materials consisted of several aspects. (Fjällräven, 2021.)*

2009 Haglöfs

Haglöfs stated that high-quality and eco-friendly manufacturing had a minor impact on the environment, and they were keen to solve problems in textile production. In 2009, they had already joined bluesign® and believed that collaboration helped persuade fabric manufacturers to adopt more responsible practices. They also mentioned recycled materials and an intention to increase their usage. Furthermore, Haglöfs mentioned their Terms of Agreement and restricted substance list, as well as the prohibition of using live-plucked down.[511]

2021 Haglöfs

Haglöfs used advanced technical fabrics to produce its outdoor apparel (Fig 58.). To ensure that the garments' performance matched the claims and that users could rely on their products in every condition, they relied on quality fabrics and careful material selection processes.[512] They worked with technical fabrics and ensured that each product was responsibly made. Different materials are needed for different purposes, and all materials require some natural resources, for example, clean water and cultivable land.[513]

511 Haglöfs, 2009; Seppälä, 2010, 97-98
512 Haglöfs, 2021
513 Haglöfs, 2021

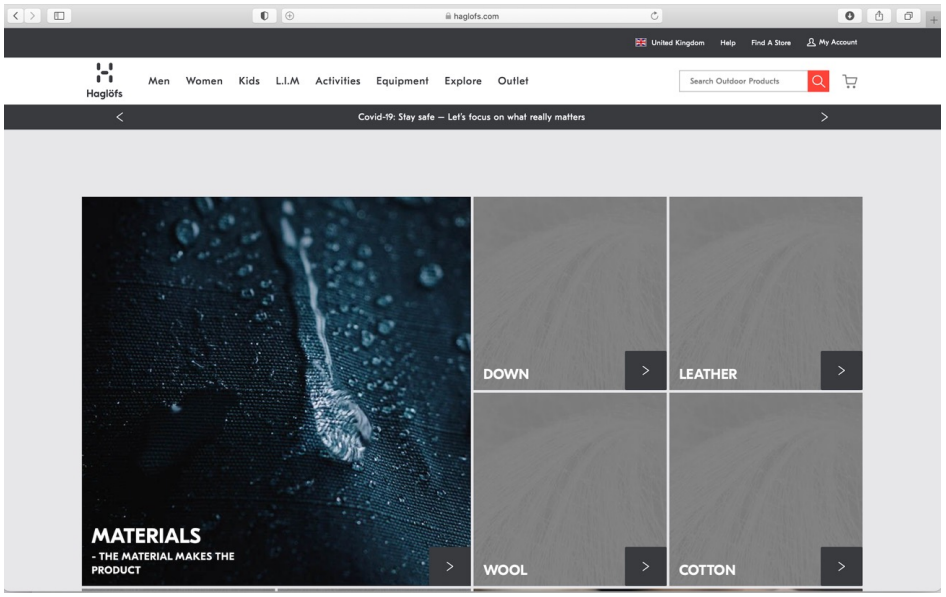


Figure 58. *Haglöfs described its materials' properties in detail. (Haglöfs, 2021.)*

Haglöfs sought to make high-quality technical fabrics with zero environmental impact (Fig. 58.). Some of their products were created with recycled and waste materials, thus producing a smaller carbon footprint, using less energy and water, and preventing unwanted products from ending up in landfills.[514] According to Haglöfs, breaking down old fabrics into their smallest component, fibers, is a complex and more expensive process than producing most new fabrics. However, Haglöfs used recycled materials in a number of their shells and backpacks, as well as recycled wool in their mid-layers and accessories.[515]

Haglöfs' transition to a circular economy was important. Since 2008, Haglöfs had been a partner in the bluesign® system. They asserted that this system is the most stringent voluntary program for textile and fabric manufacturers to improve their manufacturing and meet the most stringent environmental requirements. The bluesign® method ensures the use of sustainable components in a clean process that forbids the use of nearly 900 hazardous chemicals for manufacturing products. By eliminating all fluorocarbon DWR treatments by 2020, Haglöfs made headway in lowering fluorocarbon emissions. In addition, they ensured that their Sustainable Choice certification was displayed on all their new items.[516]

514 Haglöfs, 2021
515 Haglöfs, 2021
516 Haglöfs, 2021

2009 Houdini

In 2009, Houdini discussed Teijin's Eco Circle recycling system on their website, and they claimed to be the first European company to use this system. By 2009, they also offered a recycling option for all their garments.[517]

2021 Houdini

The benefits of Houdini's garments included using either natural fibers that were environmentally sustainable or synthetic fibers that were recyclable (Fig. 59.). Nevertheless, despite their distinctions, all garments decomposed naturally or via industrial procedures.[518]

Figure 59. *Fabric selection of Houdini aims to be recycled and ideally also recyclable. (Houdini, 2021.)*

2009 howies

As early as 2009, howies used organic Ventile fabric in their jackets. Because this fabric is made of tightly woven cotton, it swells when it contacts water. When it expands, it creates a barrier that prevents water from passing through. The cotton is hand-picked from the highest quality, longest staple fibers, which can be found only in the top 2% of the world's cotton crop, according to howies. While possessing the look and feel of natural cotton, it has the performance of a high-tech fabric when it contacts water.

Additionally, they utilized organic tweed woven by Ardalanish Tweed Weavers on the Isle of Mull, where sheep were free to go anywhere they pleased. Woad, a plant that yields an indigo hue when processed and can be used as a natural substitute for artificial dyes, was used to impart color to the wool. howies' jeans were created by combining organic cotton and organic hemp in equal parts. In addition to having a tensile strength two times that of cotton, hemp does not call for the use of traditional

517 Houdini, 2009; Seppälä, 2010, 100
518 Houdini, 2021e

pesticides or herbicides. In comparison to cotton, hemp requires far less water and does not deplete the soil of its naturally occurring nutrients.[519] The next sections discuss natural fibers in greater depth.

Natural fibers

Natural fibers can be made out of plants, animals, or minerals. This section presents findings regarding natural fibers that the brands used and how they communicated the benefits and challenges of these fibers.

2021 Haglöfs

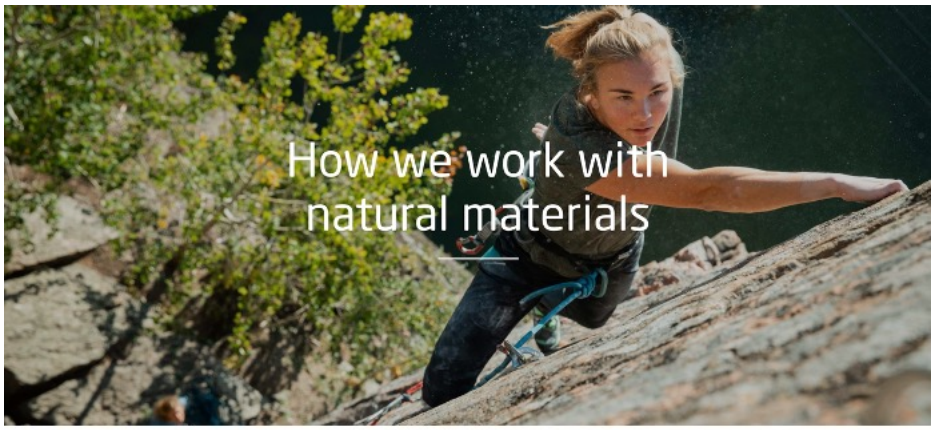
Cotton has been utilized for thousands of years and is the most well-known textile material in the world, according to Haglöfs. Cotton is comfortable, breathable, and resistant to high temperatures and repetitive wear. However, Haglöfs also observed that cotton production is detrimental to the environment since it requires immense quantities of toxic chemicals, such as insecticides, and massive quantities of water. Additionally, one kilogram of cotton requires 29,000 liters of water. In heated regions, the lack of water is problematic because water is also needed for drinking.[520]

Cotton cultivation traditionally requires pesticides and fertilizers, which can poison the soil, water, and air. Moreover, these chemicals cause serious health problems, such as headaches, nausea, dizziness, and severe allergies in farmers and people living near cotton fields. Organic cotton is grown without chemical pesticides and artificial fertilizers. Haglöfs used only organic cotton in its products, and they stated that several organizations researched the possibilities of recycling cotton and were interested in trying recycled cotton alternatives.[521]

2021 Houdini

Houdini used merino wool in many of its products because it offers a variety of valuable properties. For example, Merino wool can trap heat even when wet, and it naturally repels bacteria, which means unpleasant odors do not develop. To make Houdini's garments more durable and comfortable, they blended merino wool with other natural fibers, including Lyocell (Fig. 60.). However, they never mixed synthetic fibers with natural ones so that their clothes were biodegradable or could be recycled.[522]

519 howies, 2009; Seppälä, 2010, 105
520 Haglöfs, 2021
521 Haglöfs, 2021
522 Houdini, 2021e



"Natural fibers are constantly being developed using new technology"

Figure 60. *Houdini took an innovative approach to natural materials. (Houdini, 2021.)*

2021 Jack Wolfskin

Jack Wolfskin products included only the highest-quality certified organic cotton. Since 2013, all products included a cotton blend from a 100% certified ecological source. They strictly prohibited chemicals, fertilizers, and genetically modified seeds to protect farmers against harmful substances. Additionally, their organic farming guidelines safeguarded ecological balances in growing regions.[523]

523 Jack Wolfskin, 2021d

2021 Patagonia

Patagonia used the Regenerative Organic standard for environmental safety and invested in enhancing healthy soil and reducing greenhouse gas emissions (Fig. 61.). They claimed that food and fiber production cause climate change and that cotton is one of the worst offenders. According to Patagonia, organic farming practices return carbon to the ground.[524]

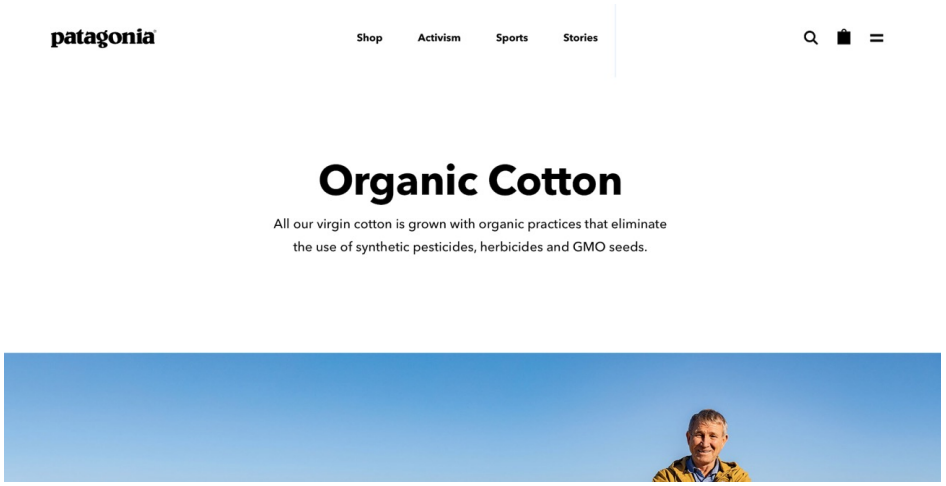


Figure 61. *Patagonia emphasized the use of organic methods in its cotton production. (Patagonia, 2021.)*

Patagonia participated in two Regenerative Organic Certified™ pilots, one in apparel and the other in food. Over 800 farmers joined Patagonia's Regenerative Organic Certification™ pilot programs, collaborating with business leaders and experts regarding soil health and animal welfare. The program aimed to rehabilitate soil, improve animal welfare, enhance farmers' lives, and reduce greenhouse gas emissions. The pilot also had a social responsibility dimension to save workers from unsafe working conditions, long working hours, low pay, and discrimination, especially female workers.[525]

Man-made fibers

This section presents findings on man-made fibers, which can be divided into synthetic and regenerated fibers.

524 Patagonia, 2021k
525 Patagonia, 2021k

2021 Arc'teryx

Arc'teryx acknowledged that microplastic pollution is a rising concern for seas and waterways. Microplastics are particles with a length of fewer than five millimeters. They originate from various sources, including the breakdown of larger plastic waste, textiles, automobile tires, and plastic containers. According to research, high amounts of microplastic fibers have also been discovered in coastal ecosystems surrounding major cities. One source of these fibers is synthetic clothing that is used and laundered.[526]

Arc'teryx sought to comprehend the relationship between individual fibers and microplastic contamination and participated in a collaborative research study coordinated by Ocean Wise to determine fabric shedding rates. The data of this study will contribute to a global library of fiber fingerprints, helping comprehend the origin, movement, and location of microplastics in the ocean. Moreover, Arc'teryx strove to contribute solution-oriented designs, methods, and decisions.[527]

2021 Haglöfs

Haglöfs stated, *"The jacket you wear should not be found in the water you drink."*[528] Haglöfs had high expectations of its outdoor clothing: the clothing had to withstand wear and tear, be easy to take care of, and preferably be good at multitasking, keep a person warm but also cooling quickly and protecting the user from the rain while breathing. Synthetic fabric exemplifies these qualities and has long been a popular material in outdoor products. It is light, flexible, and can handle moisture. However, recent reports have shown that synthetics like fleece emit microplastics that end up in water systems.[529]

Routine wear and tear cause microplastics to break down into smaller pieces. As a result, these microplastics are released every time synthetic fabrics, widely used in the outdoor industry, are washed. These microplastics can also release harmful chemicals and have become a significant cause of pollution in lakes and seas. They have also been found in plankton, which many aquatic animals consume.[530]

Haglöfs took measures to reduce the number of microplastics their products released. For instance, they only used high-quality bluesign® certified textiles with high environmental standards to minimize their use of chemicals and conserve water. Additionally, a significant portion of microplastic emissions occur when the garment is washed. Therefore, Haglöfs studied their apparel products after washing one, two, and five times to assess how many synthetic fibers or microplastics were

526 Arc'teryx, 2021c
527 Arc'teryx, 2021c
528 Haglöfs, 2021
529 Haglöfs, 2021
530 Haglöfs, 2021

released.[531] Based on the results, Haglöfs strengthened the guidelines for their fabrics and replaced materials with unacceptably high fiber emissions levels. Their mid-layer fleece garments held the same weight after several washes because they did not release many fibers. Additionally, these fleeces maintain their warmth and appearance despite repeated use and washing.[532]

Figure 62. *Haglöfs acknowledged microplastics problem. (Haglöfs, 2021.)*

Microplastics are a global problem, mainly arising from the textile industry, that has created an environmental crisis (Fig. 62.). Therefore, Haglöfs actively partnered with other Swedish clothing brands in ongoing discussions with material suppliers to solve the problem of microplastics in the environment. Furthermore, according to Haglöfs, the European Outdoor Group (EOG) gathered major global players in the outdoor industry to raise awareness and develop concrete solutions for microplastics.[533]

2021 Houdini

Houdini claimed that polyester can be recycled endlessly without reducing quality. Therefore, most of their products are made of polyester. Indeed, many garments are made of recycled polyester, many can be recycled, and most are both. According to Houdini, polyester has advantages and disadvantages. The benefits include

531 Haglöfs, 2021
532 Haglöfs, 2021
533 Haglöfs, 2021

durability, quick-drying, wicking, fast drying, and easy care. Polyester and recycled polyester fibers can also be produced using less water than many other fibers. By working closely with suppliers, Houdini's polyester production became more sustainable. Houdini's goal was to offer recycled and recyclable products to minimize environmental impact (Fig. 63.).[534]

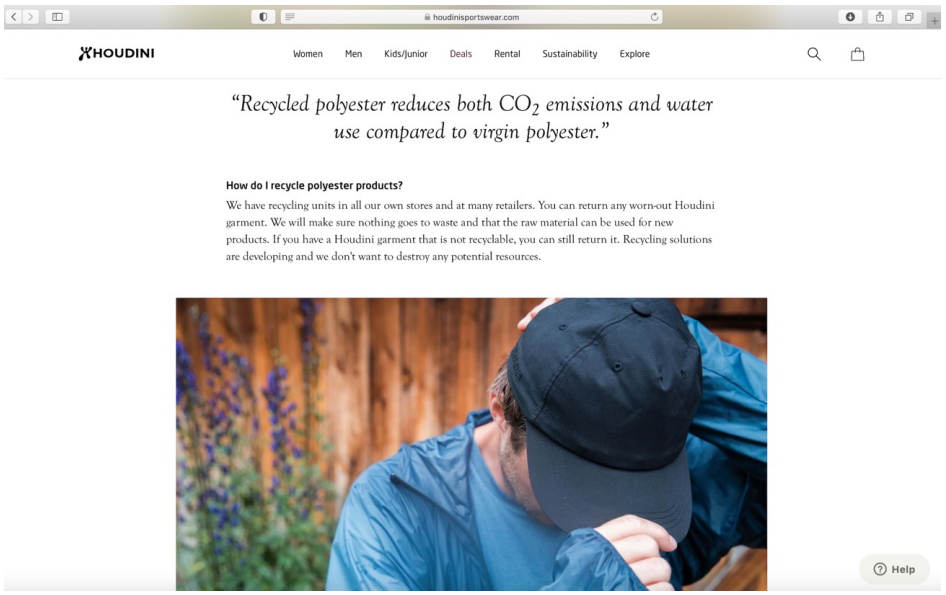


Figure 63. *According to Houdini, recycled polyester has significant advantages. (Houdini, 2021.)*

Houdini was also concerned about the growing problem of microplastics in waterways. Although they had made much progress, they believed that they still had a long way to go to address this issue. Therefore, they were working to transform their business from having a negative impact on the environment to having a positive one that provided enormous benefits for ecosystems and societies dependent on those ecosystems. They evaluated all their products against their sustainability criteria to continue progressing toward environmental responsibility.[535]

Fiber loss during garment use or washing is inevitable. However, some factors of the garments' finishing and weaving influence how microplastic leakage occurs. Thus, Houdini acknowledged the problem and worked with high-quality fibers and precision manufacturing practices to minimize fiber loss and microplastic leakage (Fig. 64.). [536]

534 Houdini, 2021e
535 Houdini, 2021e
536 Houdini, 2021e

Figure 64. *Houdini viewed microplastics as a severe problem and was working on addressing this issue. (Houdini, 2021.)*

Houdini took full producer responsibility and did not use synthetics in the same garment, as doing so increases microplastic loss and makes recycling difficult. Instead, they retrieved worn-out garments for recycling. Thus, they eliminated the likelihood that synthetics would end up in nature. In addition, they closely monitored the scientific output regarding microplastics. Because many brands were not aware of microplastics, Houdini believed that providing information on the issue was important.[537]

In 2021, Houdini actively created garments with renewable and biologically decomposable materials for sustainable textiles. New cutting and construction methods limited fiber loss in their products, and these product segments kept growing rapidly. In addition, Houdini participated in many research projects that addressed microplastic pollution from the textiles industry's point of view.[538]

2021 Jack Wolfskin

Jack Wolfskin also worked on solutions for dealing with microplastics. Microplastics are barely visible plastic particles that are recognized as a growing problem. Jack Wolfskin explained that microplastics are often used in toothpaste, shower gel, and other cosmetics. Additionally, wearing and washing of synthetic garments can cause problems as the particles are too small to be cleaned in wastewater treatment plants.[539] Microplastics that enter waterways and are consumed by fish eventually end up on human plates, posing a threat to human health. Jack Wolfskin aggressively addressed this difficult issue and developed environmentally responsible methods

537 Houdini, 2021e
538 Houdini, 2021e
539 Jack Wolfskin, 2021d

for dealing with these plastic particles. Their objective was to establish sustainable options for the global textile industry, not only for their own company and products.[540] Polyvinyl chloride (PVC) provides a tremendous advantage due to its toughness and durability. However, this same characteristic is also its downfall as PVC is practically non-degradable. Therefore, Jack Wolfskin completely stopped using PVC in their products.[541]

2021 Patagonia

Patagonia created many products using polyester, virgin, and recycled materials. Virgin, a polyester derived from petroleum products, is a lightweight material that dries quickly. Patagonia claimed that it can be blended with natural fibers, such as cotton, which allowed them to create various clothing options.[542] Patagonia discovered that they had used even more recycled polyester than any other fiber (Fig. 65.). They aimed to keep materials out of landfills and in use where possible, so their goal was to move away from virgin polyester completely by 2025. According to Patagonia, recycled polyester was first made commercially available in the 1990s and costs no more than virgin material.[543]

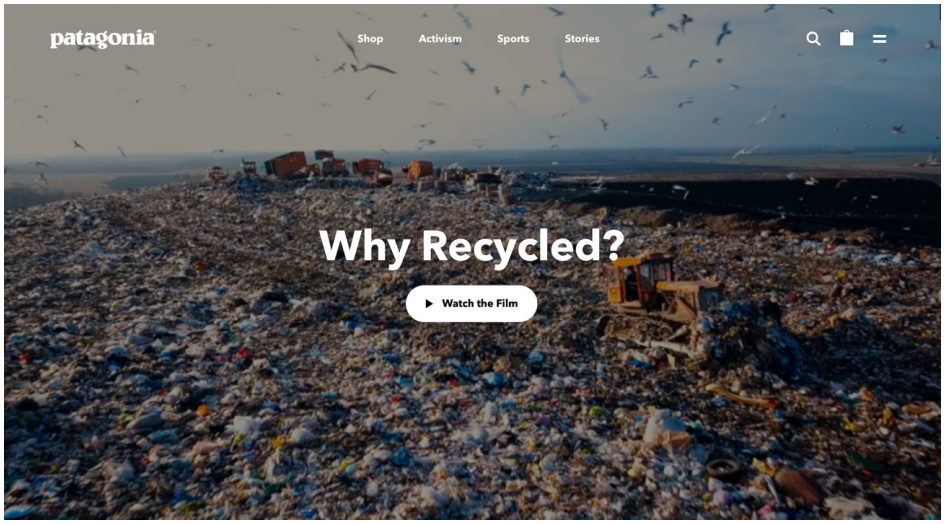


Figure 65. *Patagonia has dramatically increased its use of recycled polyester. (Patagonia, 2021.)*

540 Jack Wolfskin, 2021d
541 (ack Wolfskin, 2021d
542 Patagonia, 2021k
543 Patagonia, 2021f

Patagonia employed recycled polyester to reduce its reliance on virgin materials derived from petroleum. Polyester that has been recycled minimizes waste and greenhouse gas emissions. It can also help develop new recycling streams for worn-out polyester clothes, thereby reducing reliance on virgin petroleum as a source of raw material. Patagonia claimed that they were the first outdoor clothing maker to convert waste into fleece when they began transforming soda bottles into fleece in 1993.[544]

For the spring 2021 season, 84% of Patagonia's polyester textiles were created from recycled polyester. As a result, they lowered their CO_2 emissions by more than 3.1 million pounds, or 14%, compared that created to virgin polyester materials. Moreover, they focused on the next generation of potential recycled materials, such as recovered ocean plastics, rather than plastic bottles recycled by commodity recyclers. Patagonia also expressed interest in chemical recycling technologies to develop a closed-loop clothing recycling system.[545]

Chemical management and restricted substances lists

Fabric production requires chemicals that must be managed throughout production. This section presents the findings regarding chemical management.

2021 Jack Wolfskin

To uphold the highest standards for finished goods, Jack Wolfskin used a strict restricted substances list (RSL) that covered their products' substances and residues, including all fabrics and components, such as buttons and zippers. Since 2007, they have annually updated the RSL in their Green Book, and since April 2007, they have required the Green Book to be included in all existing supplier contracts.[546]

To ensure the safety of people and the environment, Jack Wolfskin's German goods have been evaluated by authorized, independent laboratories (Fig. 66.). These RSL inspections are based on international statutory rules, such as the European Union's REACH chemical regulation, as well as stringent industry standards, such as the bluesign® standard and the Oeko-Tex® Standard 100. In many instances, Jack Wolfskin's standards are much stricter than the regulations.[547]

544 Patagonia, 2021f
545 Patagonia, 2021f
546 Jack Wolfskin, 2021d
547 Jack Wolfskin, 2021b

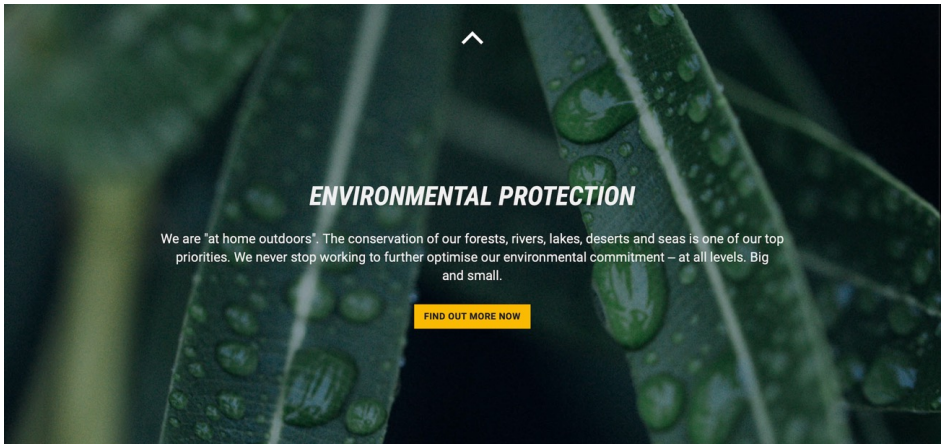


Figure 66. *The restricted Substances List is an essential part of Jack Wolfskin's environmental protection strategy. (Jack Wolfskin, 2021.)*

Dyes and finishes

This section presents the findings on dyes and finishes. Often, the functionality of outdoor garments is achieved using different finishes.

2021 Haglöfs

The solution-dyeing technique is beneficial for outdoor clothing, as the process eliminates dipping a synthetic fabric into a dye. Synthetic fibers used in outerwear are commonly dyed in eye-catching hues for appeal. However, the traditional technique of dipping fabric into dye was created before synthetic materials became popular, and this technique does not suit synthetic fabrics.[548]

Therefore, employees at Haglöfs were interested in altering their methods, experimenting with solution-dyed textiles in their selection (Fig. 67.). Using the solution-dyeing method, textiles are colored after being spun so the color permeates the fibers. If a solution-dyed fabric were cut in half and the cut end were viewed using a microscope, the color would be visible all the way through the fiber to the core. According to Haglöfs, water-dyed fabrics annually produce effluent equal to half the volume of the Mediterranean Sea.[549]

548 Haglöfs, 2021
549 Haglöfs, 2021

Figure 67. *Haglöfs invest in solution dyeing technologies. (Haglöfs, 2021.)*

The fabric-dyeing method utilized by Haglöfs eliminated the need to clean all wastewater and conserved other precious materials and energy. It eliminated the possibility of harmful colored water discharge and environmental contamination. Additionally, CO_2 emissions and electricity use were minimized. Finally, they reported that the material was attractive, with a vibrant tone far more resistant to wear and exposure.[550]

Per- and polyfluorinated chemicals

Conventionally fluorinated chemicals are used for durable water repellency (DWR) treatments, but emerging knowledge has shown that they cause health and environmental hazards. This section presents the brands' opinions and actions toward utilizing safe alternatives.

2021 Arc'teryx

Arc'teryx used durable water repellency (DWR) treatments to ensure high-performance materials in tough circumstances (Fig. 68.). In 2014, they stopped utilizing the previous generation of Per- and polyfluorinated chemicals PFCs, known as C8 or long-chain fluorocarbons, which contained perfluorooctanoic acid PFOA. Although Arc'teryx has replaced C8 with short-chain PFCs, they acknowledge that these are poor alternatives. These DWR treatments protect and prolong the life of clothing, but the chemicals remain in the environment.[551]

550 Haglöfs, 2021
551 Arc'teryx, 2021c

Figure 68. *Arc'teryx highly values good water repellency very highly. (Arc'teryx, 2021.)*

Arc'teryx had developed and tested new PFC-free DWR possibilities but had not yet discovered a suitable material. Although a variety of low-impact materials, such as silicone and modified paraffin, were evaluated, none were durable enough for regular use. Although Arc'teryx aimed to manufacture environmentally friendly products, the company would not sign a contract that would compromise performance or durability. According to Arc'teryx, a timeline for producing a new solution for water repellency is unknown, although they continued to pursue a solution that would strike a balance between safety, performance, and durability.[552]

2021 Fjällräven

The outdoor industry has long favored fluorocarbons for their water and dirt resistance. However, according to Fjällräven, many fluorocarbon-based chemicals do not readily break down in nature and can become a threat to living organisms. As a result, Fjällräven determined that switching to alternative impregnation processes throughout their product range was essential. These chemicals can also impact human reproductive and hormone production. Fjällräven decided not to use certain compounds that are suspected carcinogens.[553]

2021 Haglöfs

For several seasons, Haglöfs transitioned to fluorocarbon-free durable water repellent (DWR) treatments. However, these treatments contain persistent chemicals that could cause damage to the environment and potentially lead to bioaccumulation in human tissue. Haglöfs established ambitious targets extending beyond 2020, even when a clear path to achieve these targets was not yet entirely clear, and they decided to conduct their own investigations into fluorocarbon-free DWRs.[554]

552 Arc'teryx, 2021c
553 Fjällräven, 2021b
554 Haglöfs, 2021

An increasing range of fluorocarbon-free technologies has come to the market; these perform differently and interact with fabrics uniquely. However, finding the right DWR for each material takes time and effort. Haglöfs needed to balance the pace of transition with the availability of DWR and fabric combinations that met the performance criteria expected of high-quality products. Additionally, fluorocarbon-free DWRs are generally less durable and need regular reproofing, a trade-off they had to consider.[555]

Haglöfs converted over 95% of its range to fluorocarbon-free DWR or no DWR due to the challenges posed by fluorocarbons. They also established a timeline for phasing out fluorocarbons in their DWRs and aligned with Greenpeace in recognizing that lower-performing replacements create other issues and likely have a more significant environmental impact.[556]

2021 Houdini

In dedication to organic materials and sustainability, Houdini was one of the first companies in its sector to eliminate fluorocarbons totally. Since autumn 2018, none of their goods included fluorocarbons or water-repellency treatments. In their place, they use an organic DWR that is completely organic, water-based, and devoid of harmful ingredients.[557]

2021 Jack Wolfskin

According to Jack Wolfskin, the damage that PFCs contribute to the environment and human health outweighs their benefits, such as water-, dirt-, and grease-resistance and durability. In 2009, the company stopped utilizing the hazardous chemical PFOA (perfluorooctanoic acid) in their production process. Since 2012, the company has worked diligently to ensure that its waterproof jackets and pants are free of PFCs. Moreover, Jack Wolfskin asserted that its alternative water repellency is effective and non-toxic.[558]

Nanotechnology in textiles

Nanotechnology is a general term for under technologies under 100 nanometers used to create various functional properties. This section presents the results concerning these technologies.

2021 Jack Wolfskin

Jack Wolfskin did not use nanoparticles in its textiles. These minuscule particles

555 Haglöfs, 2021
556 Haglöfs, 2021
557 Houdini, 2021e
558 Jack Wolfskin, 2021d

have properties including water-repellency and antibacterial qualities. However, because there are no long-term studies on how human bodies react to the particles, Jack Wolfskin will not use them until studies show they pose no health risks.[559]

Anti-odor treatments

Outdoor gear is intended for moving, so anti-odor treatments are applicable. This section looks at results regarding the brands' perspectives on these treatments.

2021 Arc'teryx

Antimicrobial treatments, such as durable anti-odor (DAO), inhibit bacterial growth and odor formation in Arc'teryx products (Fig. 69.). The most commonly used antimicrobial treatment is DAO, which is composed of trace amounts of silver salts encapsulated in a non-toxic polymer that adheres to fabric surfaces. Arc'teryx asserted that the product delivers excellent odor control and a high level of durability while employing a small amount of silver. The silver is not nano silver but rather comprises silver salt compositions. Due to its greater particle size, organisms absorb it less quickly. Arc'teryx discovered that silver-based treatments, such as DAO, are the most effective choices available. Additionally, according to Arc'teryx, this approach surpasses safety and environmental performance standards because silver released from treated materials has negligible effects on human health and the environment.[560]

Figure 69. *Arc'teryx used silver salt compositions for antimicrobial treatments in its products. (Arc'teryx, 2021.)*

559 Jack Wolfskin, 2021d
560 Arc'teryx, 2021c

2021 Haglöfs

Haglöfs claimed that silver ions, which address odors, are a common feature of athletic clothing and outdoor gear. Manufacturers use silver antibacterial substances since they can kill the bacteria responsible for producing bad odors. However, these antibacterial agents rarely stay in the garment; the antibacterial substance can leak into the washing water and the water system after 10 or fewer washes. Furthermore, these anti-microbial substances do not discriminate between good and bad bacteria and can thus damage the bacteria needed to purify water. They may also affect the ability to reproduce, and antibacterial agents may increase antibiotic resistance.[561]

Haglöfs created a technology called LAVA™ to combat sweat and body odors. LAVA™ is made using zeolites, which are microporous minerals found in volcanic ash and water that purify the air. Zeolites are also used in air purification technologies and in washing powders instead of phosphates to soften hard water. The type of agent they use must be highly purified. The LAVA™ treatment, which is approved by bluesign®, resembles the pores of a sponge or a pumice stone, and sweat is captured on a large internal surface so that bacteria cannot accumulate bad odors. Every wash flushes out sweat particles from the microporous zeolites and restores the anti-odor function. In addition to environmental friendliness, zeolites keep clothes in perfect condition beyond washing 30–50 times.[562]

2021 Houdini

Houdini's pH Pure™ treatment is a natural alternative to traditional anti-odor treatments. According to Houdini, this treatment does not contain harmful chemicals but instead lowers the fabric's pH value, preventing the occurrence of odorous bacteria. The treatment is added at the yarn stage and does not wash out when a garment is washed. Since wool has inherent antimicrobial characteristics, Houdini does not treat their merino wool items with pH Pure™. Furthermore, they recognized that various individuals have distinct needs for foundation layers in terms of aesthetics, function, substance, and durability and thus provide a variety of clothing material options.[563]

Mosquito proof fabrics

Climate change has increased the threat of mosquito-spread diseases, and insecticidal garments have been utilized as one solution to this increased threat. Jack Wolfskin was the only one who mentioned the results concerning this solution.

561 Haglöfs, 2021
562 Haglöfs, 2021
563 Houdini, 2021e

2021 Jack Wolfskin

According to Jack Wolfskin, their 100% mosquito protection contains no chemicals. Rather, the mosquito-proof technology of their Lakeside clothing collection was produced by an innovative, incredibly dense fabric that is highly breathable. Therefore, it provides mosquito protection without the need for artificial insect repellents.[564]

UV protection fabrics

The amount of UV radiation has increased, as has people's awareness of it. In this section, the findings of the tests conducted on the brands' defenses against UV radiation are presented.

2021 Jack Wolfskin

Personal protective equipment (PPE) is apparel worn on the body for protection. Jack Wolfskin provides a UV protection garment range, and all PPE products are subject to strict European guidelines. The CE label and declaration of conformity guarantee that these products have been rigorously tested and meet all EU requirements.[565]

2021 Patagonia

Patagonia's ultraviolet (UV) protection enhances the fabric's ability to prevent the sun's potentially damaging ultraviolet rays from penetrating to a person's skin. Because a single article of clothing does not cover the entire body, Patagonia recommended that users apply additional forms of UV protection to avoid sunburn. UPF means ultraviolet protection factor.[566]

Patagonia employed numerous methods to enhance UV protection. Titanium dioxide (TiO2), the reef-safe active ingredient in many sunscreen lotions, can be added to yarn to offer UV protection that is extremely durable. Using unique structures and heavier textiles is another method for achieving sun protection with regular yarns. The most comfortable fabrics have an optimal blend of protection and weight. Therefore, before a Patagonia garment can achieve a UPF rating, it must adhere to stringent weight and coverage requirements. The company does not promote low-coverage clothing, such as a tank top, made from UPF-rated fabric and claim that the wearer is protected. Patagonia was continuing to study sun protection solutions.[567]

564 Jack Wolfskin, 2021d
565 Jack Wolfskin, 2021d
566 Patagonia, 2021j
567 Patagonia, 2021j

Testing

To ensure the quality and durability of garments, brands must test materials and garments. This section discusses the findings of different tests.

2021 Arc'teryx

Arc'teryx conducts extensive materials research and has developed many fabrics in-house, sourcing them directly from suppliers. They tested all of these fabrics in the lab and the field despite their origin.[568]

2009 Fjällräven

In 2009. Fjällräven utilized professional test groups and employees to test their products outdoors. Testing was necessary for determining durability and generating new ideas.[569]

2021 Millet

To ensure that fabrics met the performance requirements of their products, Millet tested textiles in a quality testing laboratory. Additionally, before approving them for use, the company performed mechanical strength tests on fabrics, including friction, tensile and tear strength tests; water repellency tests; and colorfastness tests.[570] The head of Millet's test laboratory, Déodat Bonneaux, stated, "*Our products are designed to support users for as long as possible, even in the most extreme conditions, while having a smaller impact on the environment.*" Thus, Millet's products are subjected to rigorous testing in the company's lab, and the results ensure that all materials used in production meet high standards of dependability and performance (Fig. 70.). As a result, Millet met the high requirements of its users, which range from amateur athletes to professionals working daily in the mountains.[571]

568 Arc'teryx, 2021c
569 Fjällräven, 2009; Seppälä, 2010, 93
570 Millet, 2021
571 Millet, 2021

Figure 70. *Material testing is an essential part of Millet's quality control. (Millet, 2021.)*

4.3.2 Animal welfare

Animal welfare comprises various aspects impacting animals, including habitats, water, food, and the avoidance of pain and stress. This section reveals findings concerning animal rights issues.

2021 Arc'teryx

Arc'teryx used animal-based materials in some of its products because they provide specific functions (Fig. 71.). To source these materials, the firm depended on internationally acknowledged standards and supplier declarations to guarantee that animal welfare was respected and the resources could be tracked.[572]

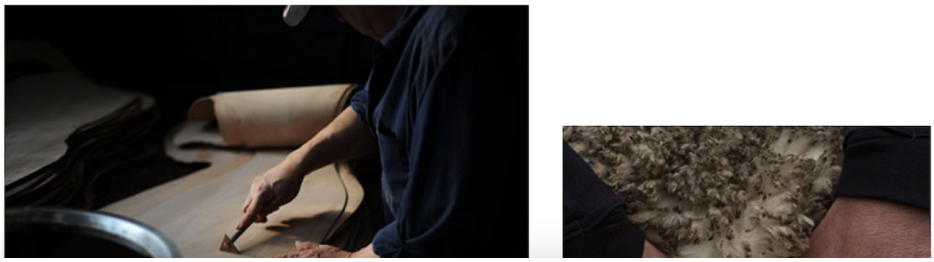


Figure 71. *Down and merino wool are primary animal fibers used by Arc'teryx. (Arc'teryx, 2021.)*

Down is a natural insulator with many benefits. Due to down's exceptional *"warmth-to-weight ratio, compressibility, and resilience,"* it was utilized in Arc'teryx's goods. The down used in these items was certified by the Responsible Down Standard

572 Arc'teryx, 2021c

(RDS), which ensures that animal welfare is managed correctly. This independent global standard provides certification from hatchlings to the final product at each supply chain step. Furthermore, RDS prohibits live-plucking and force-feeding.[573]

Arc'teryx sourced its down from responsible suppliers from Eastern Europe. All down processing occurred in the Allied Feather and Down facility in California. Allied Feather and Down has been a bluesign® system partner since 2008 and requires animal welfare verifications and third-party auditing.[574]

Arc'teryx utilized wool due to its unique moisture-wicking capabilities and unparalleled next-to-skin comfort. Most of their wool originated from ABMT in Australia and Designer Textiles in New Zealand, both of which adhere to the ZQ Merino standard or the National Wool Declaration Integrity Program. Both programs ensure the well-being of animals. All supplies consent to complying with their non-mulesing policy. Moreover, they are in the process of implementing the Responsible Wool Standard.[575]

2021 Columbia Sportswear Company

Because Columbia Sportswear was committed to animal welfare, they prohibited the use of actual fur in their goods. In addition, they anticipated that any farm-raised animal-derived material source will adhere to the Five Freedoms, the animal welfare criterion. They rejected live-plucking, forced-feeding, and any other cruel treatment of geese. Their animal welfare principles and standards were found in their stated Position Statement.[576]

2021 Fjällräven

Fjällräven goods contain materials of animal origin, including down, wool, and leather. They guaranteed that they made no compromises regarding animal welfare, including avoiding live plucking, and they knew exactly where their down, which is of the highest quality, came from. Additionally, since 2014, Fjallraven has ensured that their down is fully traceable.[577]

2021 Haglöfs

Haglöfs stated that down is nature's innovation at its best. Additionally, wool is excellent insulation material with unique properties. However, Haglöfs also claimed that the down business faces problems and the outdoor industry must stop using unethically produced down.[578]

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573 Arc'teryx, 2021c
574 Arc'teryx, 2021c
575 Arc'teryx, 2021c
576 Columbia Sportswear Company, 2021b
577 Fjällräven, 2021b
578 Haglöfs, 2021

Haglöfs used down certified according to the Responsible Down Standard. This down could be traced back to the farm, and Haglöfs was committed to ensuring that the animals were treated well. Haglöfs explained that the RDS is a voluntary standard operated by Textile Exchange, a non-profit organization that aims for integrity and sustainability in the outdoor industry.[579]

Haglöfs complied with the Responsible Down Standard, which guarantees that animals are not overly stressed, have food and water, and are not force-fed or live-plucked. Furthermore, Haglöfs used down from the food industry that would be wasted otherwise. The company conducts an annual audit to ensure that the Responsible Down Standard is followed, and a third party audits the entire supply chain process. Consumers were able to track their down products on Haglöfs' webpage.[580]

Haglöfs avoided the practice of mulesing in sheep farming, stating that the technique leaves an ugly mark on the clothing industry. The outdoor clothing industry relies on these animals, and Haglöfs argued that wool is an excellent material for outdoor wear. Wool's insulating properties are well-known, and it works effectively as an insulating layer. Modern wool garments are light and versatile with excellent next-to-skin comfort. They are also efficient at managing moisture and suppressing nasty odors when cared for properly.[581]

In the mulesing process, part of the skin on a merino sheep's hindquarters is removed to avoid infestation of insects and maintain the wool's quality. This was something Haglöfs did not want their suppliers' sheep to endure. Other methods for achieving the desired effects are available, and Haglöfs requested that their suppliers provide certification from IWTO, the International Wool Textile Organization, showing they adhered to sustainable, ethical practices. To increase the sustainability of wool, they also used recycled wool when possible. Recycled wool is typically a mix of a newly spun soft wool fiber containing 30–50% wool collected from recycled products. Using recycled wool saves a substantial amount of water, chemicals, and energy. However, traceability becomes a challenge with this raw material because determining where the original wool came from is difficult.[582]

2021 Houdini

Houdini claimed that merino wool has nearly magical qualities, making it ideal for performance clothing (Fig 72.). In addition to being naturally antibacterial, it keeps its wearer warm even when wet. It also has excellent insulating properties, making it suitable for cold-weather wear. Since the time of the eighteenth-century explorers, merino wool has been an essential component of all natural performance clothing

579 Haglöfs, 2021
580 Haglöfs, 2021
581 Haglöfs, 2021
582 Haglöfs, 2021

due to these characteristics. Houdini assured that all wool used in their products was traceable and free of mulesing.[583]

Figure 72. *Houdini appreciated properties of merino wool and prohibited mulesing. (Houdini, 2021.)*

2021 Jack Wolfskin

Because Jack Wolfskin was unable to verify that the extraction of wool from angora rabbits was performed without causing suffering or violating the ethics of the rabbits' living conditions, they decided never to use angora wool. The down used in Jack Wolfskin clothing came from sources certified by independent bodies. Since 2013, the company has allowed the Responsible Down Standard (RDS) of the US organization Textile Exchange to check their strict animal welfare demands, and they especially forbid live-plucking and force-feeding. The RDS has a seal that can be attached to products, and it ensures that the down supply chain is free from unnecessary harm.[584]

Furthermore, Jack Wolfskin items do not include real fur. The company opposed raising animals for their fur and the use of fur in fashion, both of which contradict the company's commitment to animal preservation. Therefore, every "fur" used in their items is of high-quality synthetic construction. Additionally, they participated in the global Fur Free Retailer Program; all firms participating in this effort have renounced the use of actual fur. Customers have access to a list of participants, and the program is managed by Four Paws.[585] To ensure their wool was ethically sourced, Jack Wolfskin maintained an ethical wool policy to provide ethical living conditions for sheep. In addition, they prohibited mulesing and only used RWS (Responsible

583 Houdini, 2021e
584 Jack Wolfskin, 2021d
585 Jack Wolfskin, 2021b

Wool Standard)-certified wool in their products. Their goal was to obtain 100% RWS-certified wool by 2025.[586]

2021 Millet

According to Millet, *"The outdoor industry is among the chief recipients of criticism from NGOs such as PETA and FOUR PAWS regarding animal protection and welfare."* The use of materials such as down, leather, fur, and wool is potentially problematic since these materials involve the exploitation of animals. Although down is useful for constructing jackets that are warm, lightweight, and functional, in certain cases, down is extracted from living birds that have been forcibly fed or reared under inhumane conditions. Millet collaborated with Textile Exchange, the non-profit organization responsible for developing the Responsible Down Standard, to reduce the likelihood of abuse (Fig. 73.).[587]

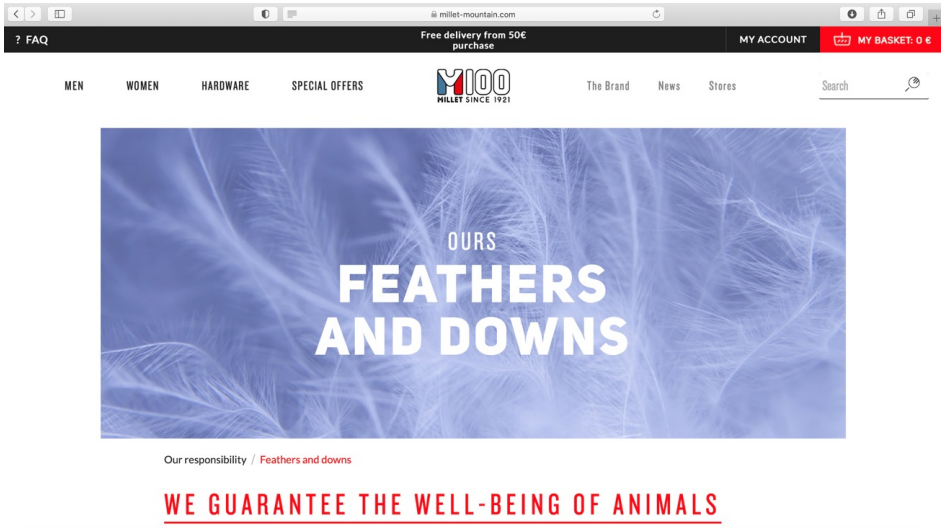

Figure 73. *Millet openly explained criticism of NGOs from organizations like PETA and FOUR paws and explained their collaboration with the Responsible Down Standard (Millet, 2021)*

2021 The North Face

The North Face collaborated with Textile Exchange to create and launch the Responsible Down Standard (RDS) in 2014 based on their research. The non-profit Textile Exchange aims for sustainability in the textile industry through third-party certification. The RDS prohibits unnecessary harm to animals, force-feeding, and

586 Jack Wolfskin, 2021d
587 Millet, 2021

live-plucking and ensures traceability of the supply chain. Every stage of the supply chain is audited and documented. The North Face has used RDS-certified down in their products since fall 2015, and since 2016, they have only purchased RDS-certified down. As indicated above, the RSD has been adopted by many other brands.[588]

2021 Patagonia

Patagonia sourced down from geese and ducks that had not been force-fed or live-plucked. Furthermore, Patagonia used the Advanced Global TDS standard to ensure that force-feeding and live-plucking were prohibited, and the NSF International certified the down. Patagonia certified that 100% of the down used in its products was sourced from farms certified by NSF International. An essential part of the certification process is onsite auditing at parent farms, where birds are raised to produce eggs. Because live-plucking often happens on these farms, Patagonia wanted to ensure that its entire down supply chain was ethical.[589]

Patagonia has also adopted the Responsible Wool Standard (RWS), promoting animal welfare and land management standards. In 2014, Patagonia worked with the Textile Exchange, as well as other brands, suppliers, and NGOs, to create the RWS. They then adopted this standard as their baseline requirement for farmers. The RWS includes farm-level practices for handling animals, nutrition, shearing, medical treatments, and sustainable grazing methods. The RWS also ensures chain-of-custody practices that ensure that wool comes from farms that are certified. In addition, Patagonia has developed its own Patagonia Wool Standard (PWS), which is stricter than RWS.[590]

2021 Peak Performance

Peak Performance expressed dedication to animal welfare, stating their stringent policy on the use of materials obtained from animals. They verified that only skins from sheep, cows, goats, rabbits, and pigs were utilized and that they did not accept feathers or down from living birds. Furthermore, only RDS-certified and traceable down was purchased.[591]

Outdoor clothing uses a wide variety of different types of materials. Both natural and man-made fibers have their challenges. Growing natural fibers requires the use of pesticides. Therefore, the amount of organic fibers is increasing. Animal fibers are challenging to animal welfare, and synthetic fibers cause microplastic pollution. The brands revealed these challenges and also proposed solutions. There has been apparent change after 2009. Comparison of the fibers is complicated.

588 The North Face, 2021b
589 Patagonia, 2021e
590 Patagonia, 2021g
591 Peak Performance, 2021

4.3.3 Use

Users have significant responsibility for the longevity of their clothes. This section examines how the brands advised their consumers to care for products.

Care and repair

Care and repair can extend the product lifespan and impact environmental responsibility. This section presents the brands' communication and actions toward clothing maintenance.

2021 Arc'teryx

Arc'teryx viewed its products as systems that require appropriate care and attention to maintain top performance over time. They stated that proper care is one of the simplest ways to extend the life cycle of any product. For example, technical fabrics, waterproof membranes, and adhesives maintain their function better with regular washing and occasional retreatment. As a result, not only does a well-maintained product function better, but it also lasts longer.[592]

Arc'teryx's Product Care FAQ provides information on proper care for technical products. Arc'teryx repairs some tears and damage to its products, most of which can be fixed. In 2017, it repaired 13,110 items at its Vancouver manufacturing facility alone, returning the items to their owners for further use. Arc'teryx worked with its long-term donation partners to find new homes for products that could no longer be repaired to their quality standards. The company also donated many programs, such as outdoor gear libraries, to support outdoor youth initiatives.[593]

2021 Fjällräven

Fjällräven strived to create clothing and hardware that lasts for years; however, catch tears, loose buttons, and jammed zippers are still common. Therefore, the company offers a limited repair service but prefers to provide people the know-how to fix their gear themselves.[594] They used robust materials and reliable components to produce timeless pieces that can be repaired, not replaced (Fig. 74.). Furthermore, they took great care in designing each piece to meet the needs of their users, spending hours in the field testing their products and listening to customers. Fjällräven stated that their excellent jacket also collects memories. Their design process is not short, but they do not like to compromise quality and utility. Instead, they ensure their products are the best available by using sustainable materials and components with minimal environmental footprints. As a result, their products offer useful functions without sacrificing style.[595]

592 Arc'teryx, 2021c
593 Arc'teryx, 2021c
594 Fjällräven, 2021a
595 Fjällräven, 2021b

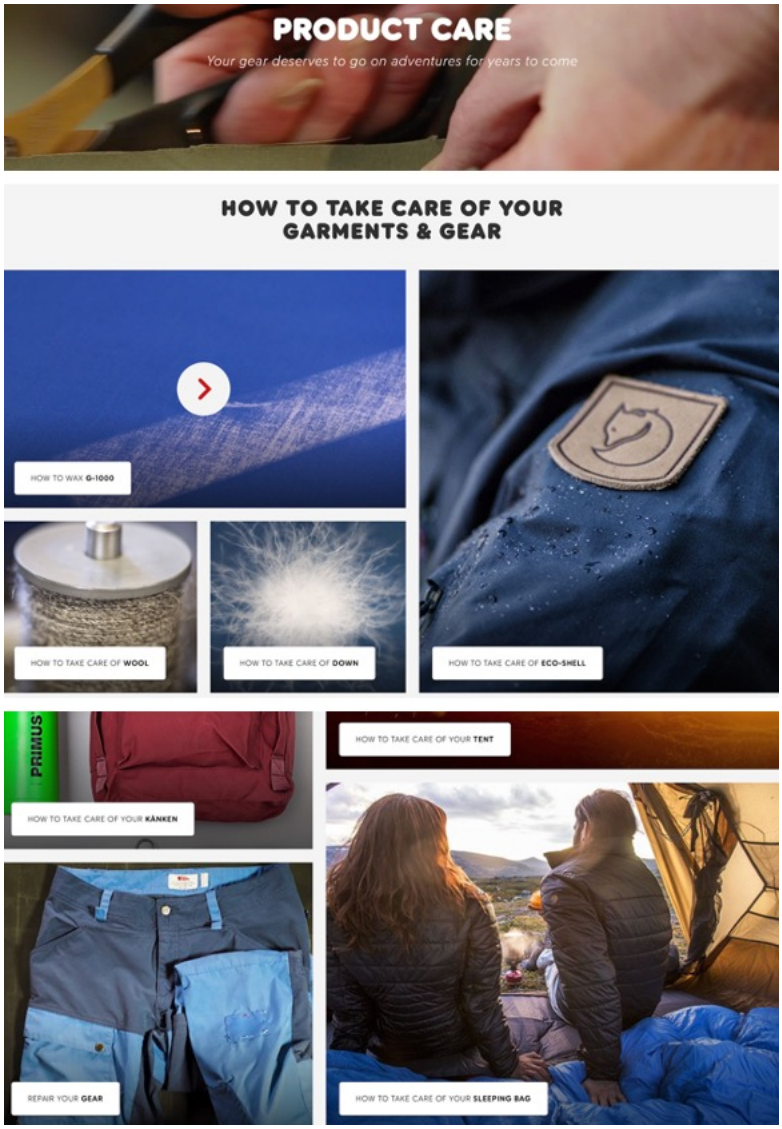

Figure 74. *Fjallraven provided detailed care recommendations for specific product types. (Fjällräven, 2021.)*

2021 Haglöfs

Haglöfs stated that the most effective way to reduce a product's overall environmental footprint is to keep it in use for as long as possible (Fig. 75.). Users can extend a product's lifecycle by taking care of the gear and mending it when needed, such as, for example, patching a tear in their pants or reproofing their jacket. Haglöfs wanted to ensure that their products were easy to take care of so that users would stay warm and dry. However, as some parts, such as zippers, wear out more quickly than others, they

were working hard to improve the design by reinforcing where needed and making it easier for users to replace and fix the garments themselves. Moreover, when things broke, they were happy to help with new parts, advice, and handy tips.[596]

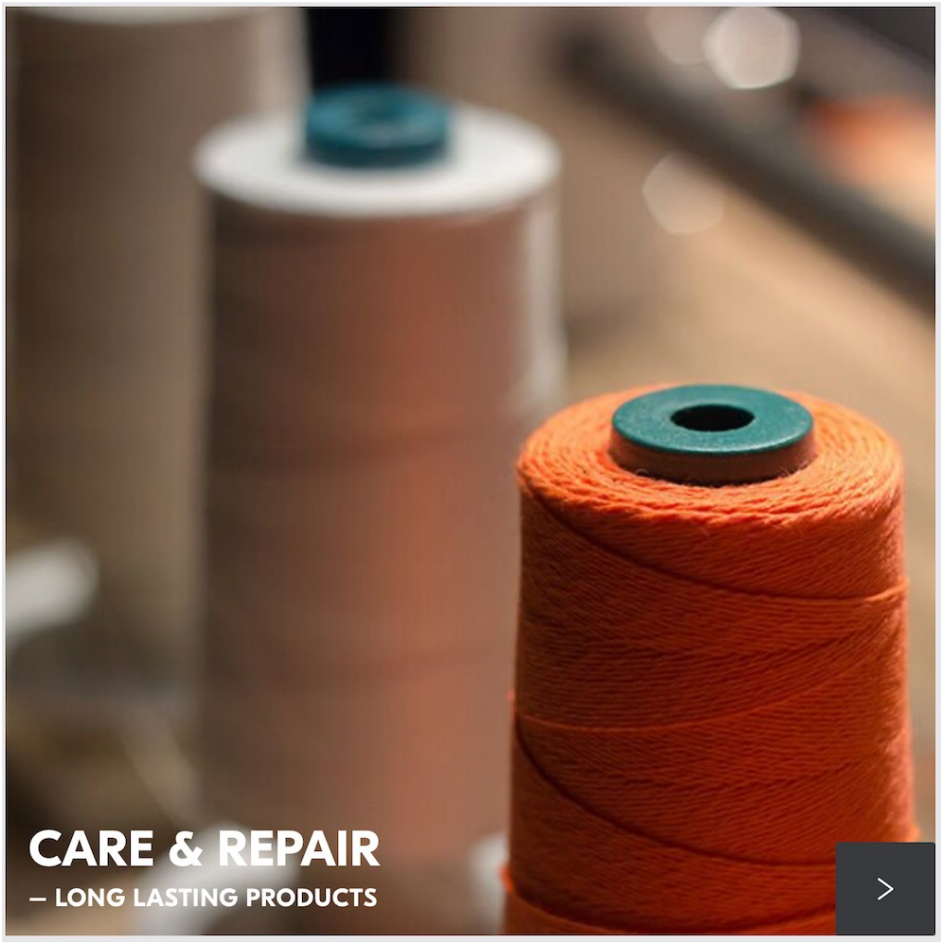

Figure 75. *Haglöfs provides care and repair instructions for durability. (Haglöfs, 2021.)*

When designing environmentally friendly products, Haglöfs considered how the product would be used and what was best for each product. For example, Haglöfs recommended washing garments less frequently and airing them instead. Tiny fibers often break loose from fabric during the laundry process and end up in lakes and streams. Before purchasing a new product, users should consider what they need. Haglöfs recommended products for multiple purposes; the more uses a product has,

596 Haglöfs, 2021

the longer it lasts and the less material is used in production. Furthermore, they stated that users should buy something they like, which increases the likelihood that users will desire a longer lifespan and care for their garments. Haglöfs desired that people understand how to care for their items in the best way possible before, during, and after their next adventure.[597]

Haglöfs' care instructions provided users helpful advice. If users were tired of a product or had outgrown it, they could pass it along to someone who might use it. Another option given was recycling; most large chains and brands accept old textiles for recycling. Regarding manufacturing mistakes, such as a misplaced button or incorrect color, Haglöfs did not consider these items ready for the landfill. Instead, Haglöfs fixed them and sold them at a lower price under their Second Chance initiative, located in their Brand Store in Stockholm.[598]

2021 Houdini

Houdini's design philosophy was built on long-lasting products. If any part of a garment broke before the garment was worn out, they repaired it for the customer free of charge. Likewise, if the customer damaged a Houdini product, they were able to buy the same repair service at a reasonable price. Houdini identified three environmental impact aspects of clothing: how long the product will last before it is worn out, how it has been cared for, and what can be done after it can no longer be used for its intended function.[599]

According to Houdini, consumers should consider buying durable, timeless clothing made of recycled and recyclable fibers to reduce their environmental impact. They should also use environmentally certified detergents and cleansers to maintain the appearance of their clothes. In addition, users should fill their machines with as little water and detergent as possible since both consume energy and water, rather than washing clothes separately as many instructions suggest.[600]

Houdini offered recommendations on how to care for clothing so that it lasts as long as possible (Fig. 76.). Additionally, Houdini stores offered information, sold washing bags and care products, and recycled old gear. They recommended that users avoid using fabric softener because it harms the garments' performance and the environment. Second, Houdini reminded users to close zippers and Velcro closures that can harm the garment. Third, washing bags were recommended to protect garments from stretching and leaking microplastics into rivers and oceans.[601]

597 Haglöfs, 2021
598 Haglöfs, 2021
599 Houdini, 2021e
600 Houdini, 2021e
601 Houdini, 2021e

Figure 76. *Houdini provides thorough care instructions for its clothes. (Houdini, 2021.)*

Houdini also provided users with information on caring for different types of clothing. They explained the differences between layered fabrics. For example, the DWR on a garment can wear off, which requires reapplication to extend its lifespan. Houdini also mentioned that wool does not need frequent washing because of its natural bacterial and dirt resistance.[602]

2021 Jack Wolfskin

Jack Wolfskin believed that durable, high-quality items are beneficial to the environment. According to the company, developing products that retain their functionality and can be worn for an extended period of time is a significant component of the company's sustainability philosophy. This perspective renders their products more environmentally friendly, as they consume less energy and fewer raw materials over time. Additionally, Jack Wolfskin offered a repair service in Germany and Austria that could correct minor damage. This included patching holes and re-waterproofing clothing, ensuring that the products remained completely functional for a longer period. Each store in the Jack Wolfskin network sent broken items to their repair team.[603] Furthermore, the longevity of the apparel and its functional properties could be extended by following Jack Wolfskin's care instructions. Users were able to find comprehensive information about the proper handling of their products on the company website. The company also offered "*optimal, environmentally friendly care and waterproofing products, all bluesign® certified, PFC-free, and free from harmful pollutants". A waterproofing service* and *repair service* completed their range of after-sales services.[604]

602 Houdini, 2021e
603 Jack Wolfskin, 2021d
604 Jack Wolfskin, 2021d

2021 Millet

To extend the life of their products, Millet established a repair service in Annecy-le-Vieux where all products returned to their after-sales service were processed and repaired (Fig. 77.). This service strived to restore the product's condition and extend its life by resolving any quality issues under warranty or mishaps during use, such as tearing not covered by the warranty. Lastly, they invited users to follow their simple care recommendations to increase their products' performance and life and thus prolong users' enjoyment of their favorite activities.[605]

Figure 77. *Millet offered repairing service and care instructions. (Millet, 2021.)*

2021 Peak Performance

Peak Performance has partnered with Clevercare, which advises customers on how to wash and care for their garments in a way that is good for the garment and the environment.[606]

Use-oriented product-service systems

Service business models have created a new approach to linear consuming models. This section discusses innovations in this field.

605 Millet, 2021
606 Peak Performance, 2021

2021 Houdini

Houdini utilized new methods for offering its products to reduce their customers' environmental impact (Fig 78.). By designing with a minor impact, they created clothing with a minimal footprint. However, they also sought innovative alternatives that allow users to consume less. For example, they provided users the opportunity to share garments and use products for longer by providing access to these products without users' buying them outright. In this method, the user does not need to own, store, or care for the clothing.[607]

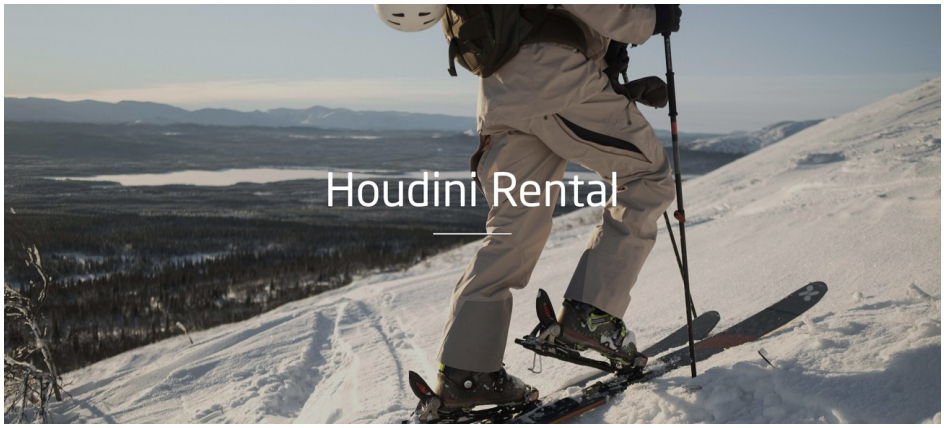

Figure 78. *Houdini had a rental service allowing clients to rent clothing and other products rather than purchase them. (Houdini, 2021.)*

Houdini anticipated that sharing would play a greater role in future consumption. The traditional method of selling items has generated unsustainable business models and practices, which are frequently undesirable for all stakeholders. The Houdini service has existed for five years and enables consumers to rent items as an alternative to purchasing them. This is often more convenient for users and reduces resource consumption. The company planned to make their rentals available online and through select partners, and to develop additional product-as-a-service offerings for introduction within the next few years.[608]

Houdini has had a subscription service since 2018 that allows subscribers to use their garments without owning them. The subscription program provides an alternative to renting, for which users pay a fee each time they use the garment. With a subscription, they instead pay a monthly fee that provides them access to a garment library with options to switch when they want. (Fig. 79.). Houdini expressed the

607 Houdini, 2021a
608 Houdini, 2021a

desire to launch a public version of the subscription program soon. They wanted to test an intelligent alternative to owning products to create a sustainable way for their customers to access everyday items and adventures while allowing someone else to take care of, repair, and store the items safely.[609]

Figure 79. *Houdini has developed alternatives to ownership-based business models. (Houdini, 2021.)*

Houdini also created a way to grow financially without using more of the earth's resources as the responsibility to take care of, extend the lifetime of, and eventually recycle the garment feel entirely to the company. However, customers could choose between different packages that provided access to different product libraries. The customers paid a monthly fee, had four garments at home, and could switch garments when they wanted. Houdini's goal was to estimate their service's total environmental impact, including all use of resources, transportation, and warehouses.[610]

Warranty

The quality of the products and brands can be supported through a warranty system. This section presents the findings of warranty procedures.

2021 Houdini

Houdini's design philosophy aimed to create long-lasting products by ensuring quality, style, and functionality. Therefore, Houdini instituted a lifetime warranty for their products. They aimed to make every part of the product last a lifetime, repairing or replacing parts when necessary. Houdini's repair service also addressed

609 Houdini, 2021a
610 Houdini, 2021a

user-damaged Houdini products for a reasonable price. Thus, they aimed to extend the lifetime of Houdini products by repairing them or recycling them into new products. They also accepted damaged products to be recycled. Houdini's repair service aimed to have long-term positive impacts on the planet (Fig. 80.).[611]

Figure 80. *Houdini's guarantee covered any repairs or replacements necessitated by defects in quality it has created. (Houdini, 2021.)*

2021 The North Face

The product stewardship philosophy of The North Face was built on client happiness and creating items that last a lifetime. Thus, they provided a lifetime warranty on their gear and equipment to prevent waste and lessen the need to purchase replacement items. Members of their warranty team have an average of 25 years of experience with The North Face.[612] Their department of warranty and repair was responsible for all returned products and those damaged during shipment or stocking. The primary objective was to repair and repurpose goods. When this was not practicable, The North Face ensured that products were ethically recycled or downcycled. Additionally, they attempted to find the best use for their surplus materials.[613]

2021 Patagonia

Patagonia is fully committed to offering the highest quality gear. To that end, they offer a lifetime warranty on all their products. If users are unsatisfied with the product, they can return it to the store where they bought it or directly to Patagonia

611 Houdini, 2021a
612 The North Face, 2021a
613 The North Face, 2021a

for a repair, replacement, or refund. If the user damages the product, Patagonia will repair it at a reasonable price.[614]

4.3.4 End of use

How companies and users handle the stage at which the garment is no longer usable is critical for environmental friendliness. This section examines how the outdoor clothing industry can move toward a circular system.

Reuse

The easiest solution to extend garments' lifespan is giving them to somebody else to reuse, as this solution does not require any external resources. This section presents the findings on reuse.

2021 Houdini

Houdini created a marketplace for used clothing on their web shop and on Instagram. This marketplace allowed users to locate unique, high-quality clothing on Houdini platforms or given their old Houdini garments new life by forwarding them to a new owner. Thus, Houdini considered how to extend longevity of their apparel in many ways. They concentrated on quality and style, and they considered other services to extend the garment's lifespan. For example, their secondhand service allowed users to sell their Houdini products and find unique pieces. In 2021, Houdini's reused garments could only be purchased online in Sweden, as was the case with their regular collection. However, Houdini hoped to open this service to more countries.[615]

According to Houdini, users sometimes forget when buying new clothes that their responsibility does not end there. Besides not washing garments too often or buying cheaper garments, consumers should ensure that garments end in a closed loop that prevents microplastics from entering the ocean. Houdini recycled, reused, and sold second-hand to maximize their products' lifespan and minimize their environmental impact. Furthermore, the company provided recycling boxes in their stores and in places where people use garments to make recycling easier.[616]

Recycled materials

One element of the circular system is to use of recycled materials in textile production. This section opens the results on that.

614 Patagonia, 2021i
615 Houdini, 2021c
616 Houdini, 2021d

2021 Jack Wolfskin

Jack Wolfskin used the Global Recycled Standard (GRS). They made a jacket out of recycled polyester, including the shell fabric, lining, and membrane. Their next step was to produce accessories from recycled materials and have these materials approved by bluesign®. Furthermore, the company used recycled PET bottles for shell fabric, as well as membrane remnants leftover from the membrane manufacturing process that would otherwise go to waste. Jack Wolfskin called it the zero-waste concept.[617]

2021 The North Face

The North Face aimed to improve the environmental performance of its products continuously (Fig. 81.). For this reason, the company sought to reduce its reliance on fossil fuels by repurposing existing materials, such as soda bottles and using innovative materials and manufacturing processes. Recycled polyester has a smaller environmental impact than virgin polyester on air and water resources.[618]

Figure 81. *The North Face had a closed-loop recycling program. (The North Face, 2021.)*

2021 Houdini

To achieve a circular economy, Houdini avoided mixing natural and synthetic fibers. Because they combined wool with other biodegradable fibers, such as silk and lyocell Tencel, their goods are biodegradable and recyclable. They mixed synthetic

617 Jack Wolfskin, 2021d
618 The North Face, 2021b

polymers only when required for performance. Technological developments and current recycling technologies provided the basis for this methodology. Therefore, Houdini will change their policies when a technological breakthrough allows them to do so.[619]

2009 Sierra Designs

Sierra Designs developed an internal "Green Team" in 2009 to investigate ways to make the company's actions more ecologically friendly. In addition, the brand incorporated eco-friendly materials into its sustainable goods, including CoconaTM, recycled Polyester, Bemis® PVC-free tape, and solvent-free membranes, as well as its 70% green trade show booth. In their thermal layer clothes, they employed Polartec recycled fleece manufactured from recycled soda and water bottles. Furthermore, they used recycled polyester in their down jacket.[620]

Leftovers

One waste challenge is the leftover fabric from production. This section presents findings on the companies' approach to these leftovers.

2021 Haglöfs

Haglöfs did not consider the remnants of material from their production process to be waste. Instead, they regarded them as leftovers. This perspective allowed them to conceptualize possibilities for these discarded parts more easily. They also recognized that leftovers could be utilized, valued, and relished, as even leftovers can be used to make something unique. They questioned how the leftovers could be turned into something genuinely great rather than discarded, given the excellent quality and high-performance features of the materials used to manufacture their gear. As a result, they used the remnants to create the Leftovers collection.[621]

Clothing compost

The concept of clothing compost requires that the garment be degradable and safe to compost. This section discusses the topic of composting clothing.

2021 Houdini

Houdini opened the world's first compost for worn-out sportswear in Stockholm's Rosendals Garden in the fall 2018. Houdini intended to use this compost as a testing ground for its degradable natural clothesline. Additionally, Houdini wanted

619 Houdini, 2021a
620 Seppälä, 2010; Sierra Designs, 2009, 126
621 Haglöfs, 2021

to witness the transformation of its garments into soil for flowers, fruits, and vegetables.[622]

Recycling

Garment recycling has various fiber and chemical requirements. Traditionally, complex outdoor clothing has been challenging to recycle. This section presents the brands' recycling approaches.

2021 Houdini

Houdini's first recycled and recyclable clothing was launched in 2007. In 2021, the majority of their products were entirely circular (Fig. 82.). Furthermore, the company implemented a take-back system for all their products. They aimed to change the linear consumption model to a circular one, which they defined as products made of recycled, organic, renewable, or biodegradable materials that are designed to be recycled after use. Houdini claimed they were the first European brand to adopt Teijin's Eco Circle system for closed-loop recycling in 2006.[623]

Figure 82. *Houdini had high regards for recycling and closed-loop systems. (Houdini, 2021.)*

Houdini's recycling ensured that nothing was wasted and that their raw materials could be repurposed. For instance, if a person has a non-recyclable Houdini garment, they can still return it. They are researching recycling solutions and do not wish to destroy potential resources.[624]

622 Houdini, 2021a
623 Houdini, 2021a
624 Houdini, 2021a

2021 Columbia Sportswear Company

Columbia created a recycling program in the US called the ReTreads program. The program, which was based on I:CO's textile recycling system that sorts garments for reuse and recycling, accepted clean and dry used clothing in Columbia's stores. For example, unusable garments can be recycled into new fabrics or downcycled into insulation, carpet padding, or toy stuffing.

2009 Millet

Millet had already established a recycling program in 2009 for climbing ropes. According to their website, they had recycled 150,000 meters of rope between 2005 and 2008.[625]

The use stage of the garment life cycle significantly impacts apparel's life span. The user can extend the life span by taking care of the clothing. Some brands offer extensive care and repair directions. There are also several alternative solutions to reuse and recycle garments after the initial use. However, thinking and providing of these solutions has expanded after 2009. The next section looks at social responsibility.

4.4 Social responsibility

Social responsibility includes ethical consideration and practices toward fellow human beings. The purpose of social responsibility is to ensure a safe work environment for all people. This section presents what the companies published about their social responsibility actions.

2021 Arc'teryx

Arc'teryx claimed that engaged workers bring products to life. Thus, taking care of employees and supporting their well-being has long been a priority for the company's operations (Fig. 83.). They argued that workers' engagement and passion create better products. Arc'teryx also emphasized responsible manufacturing.

Figure 83. *Arc'teryx paid attention to responsible manufacturing. (Arc'teryx, 2021.)*

625 Millet, 2009; Seppälä, 2010, 110

Arc'teryc stated that COVID-19 revealed the concerns of all the people who work on their products, especially those beyond their immediate influence. As a result, they were aggressively investigating all areas and were seeking problem solvers who desire to accelerate significant global system shifts. One early solution was to adopt the Fair Trade Certification, one of the most widely used strategies for improving workers' livelihoods. They hoped the new industry-wide minimum would represent a bottom-line commitment to employee well-being.[626]

2021 Columbia Sportswear Company

The HERproject, in which Columbia Sportswear Company participated, is a multidimensional program aimed at empowering women working in global supply networks (Fig. 84.). Because women represent 75% of Columbia's worldwide supply chain workers, the company was particularly interested in programs that improve women's lives. More than 50,000 workers in their supply chain have benefited from HERproject programs since its launch in 2008.

Chhavi Ghuliani, associate director of HERproject, defined the organization's purpose and origins as follows: *"The mission of HERproject is to unlock the full potential of women working in global supply chains. We achieve our mission by implementing programs in factories and farms around the world to promote women's health, financial inclusion, and gender equality."*[627]

Figure 84. *HERproject empowered women in the supply chain and advances gender equality. (Columbia Sportswear Company, 2021.)*

626 Arc'teryx, 2021a
627 Columbia Sportswear Company, 2021a

The HERproject was designed to aid women employed in supply chains. Numerous women who work outside the home for the first time have made sacrifices. These women may not take care of their health, may have given men in their households control over their salaries, and may face gender-based discrimination from male coworkers and bosses.[628]

The project's objective was to provide workplace information, skills, and resources. HERproject programs were free for employees, occurred during work hours, and were suitable for both genders. The curriculum focused on three topics: health, finances, and courtesy. HERhealth focused on health-related topics, including diet, personal hygiene, menstrual hygiene, and maternal health. HERfinance improved women's understanding of their financial rights so they could to participate in household financial decisions and control their salaries. HERrespect combatted gender-based violence by addressing gender and societal norms. For Columbia Sportswear Company, empowering women, whether they worked in factories or on farms, was an important indicator of the program's success. Women's empowerment was a top priority, which was not the case 10 years before.[629]

2021 Haglöfs

Environmental and social sustainability were equally important to Haglöfs, which is why they joined Fair Wear in 2012. Fair Wear, a non-profit organization based in the Netherlands, engages with companies, manufacturers, trade unions, non-governmental organizations (NGOs), and governments to improve working conditions to exceed the legal minimum. Poor working conditions continue to be an issue for outdoor brands, and this was a crucial sustainability issue that Haglöfs could not ignore but also could not solve alone. Rather, the solution requires extensive cooperation.[630]

Haglöfs believed that they could change the industry with other brands, suppliers, non-governmental organizations, and labor unions. Because of this, they chose Fair Wear. In addition, Haglöfs' employees visited their production mills annually to ensure a high-quality standard, examine the working conditions in which their products were manufactured, and maintain positive relationships with their suppliers. Haglöfs' commitment to Fair Wear necessitated routine, comprehensive third-party audits of their manufacturing facilities, transparent grievance procedures, and official performance reporting. Due to these stipulations, Fair Wear is regarded as the most rigorous independent standard for supply chain monitoring available on the market.[631]

Haglöfs adopted Fair Wear's eight strategic pillars, which are based on International Labor Organization (ILO) standards and encompass forced labor, child labor, excessive

628 Columbia Sportswear Company, 2021a
629 Columbia Sportswear Company, 2021a
630 Haglöfs, 2021
631 Haglöfs, 2021

working hours, gender-based violence, and occupational health and safety. In addition, the pillars advocate for freedom of association and fair wages for workers. Fair Wear monitors the progress of its members, shares knowledge, and fosters dialogue.[632]

Audits were conducted in conjunction with other Fair Wear member brands so that both parties could benefit from collaborative audits. The member brands have greater transparency and can share costs for the audit, while the manufacturer has only to stop their typical production once, as opposed to once for each brand. Through this collaboration, Haglöfs had more influence to improve working conditions at production sites, resulting in better places of employment. They accomplished this by aiming for living wages, restricting working hours, and enhancing employees' democratic rights.[633]

In addition to cooperative follow-up on audits, which results in more transparency among member brands, workers dissatisfied with their working circumstances can file an anonymous complaint through the Fair Wear system. The member brands produced at the affected factory are then responsible for resolving these complaints. The audit results, sourcing strategy, and complaints are included in an online social report. Additionally, Fair Wear publishes an annual report on the Brand Performance Check detailing their efforts to improve their supply chain incrementally.[634]

Fair Wear also provides support and resources to work toward safe factories in which workers are paid a living wage and are provided with fair working conditions. However, effecting lasting change takes time. Therefore, Fair Wear and its brands adhere to a methodical strategy. Fair Wear collaborates with industry partners to reform the garment industry, and together, they devise a realistic and novel solution to labor rights violations.[635]

2021 Jack Wolfskin

According to Jack Wolfskin, their employees' health and work-life balance were important to them (Fig. 85.). Therefore, Jack Wolfskin aimed to develop the professional competency of its personnel by improving their health. They utilized numerous methods to achieve this goal. For example, they organized health days once a year to provide their staff with thorough, individual physical examinations, training (e.g., eye care education), personal preventative consultations, and educational lectures. In addition, frequent informational events and workshops were held on various health themes. Moreover, as part of their health management program, they placed especially high importance on athletic activities.[636]

632 Haglöfs, 2021
633 Haglöfs, 2021
634 Haglöfs, 2021
635 Haglöfs, 2021
636 Jack Wolfskin, 2021c

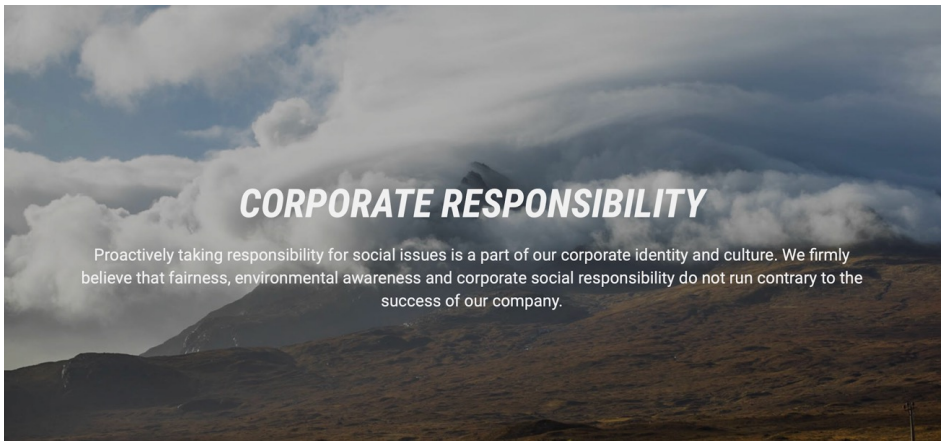

Figure 85. *Jack Wolfskin incorporated its social responsibility into its corporate responsibility program. (Jack Wolfskin, 2021.)*

According to Jack Wolfskin, everyone with a rigorous and fast-paced work life must maintain physical balance, physical strength, and mental and physical peace. Therefore, Jack Wolfskin offered a variety of sporting activities to their employees. Furthermore, they catered to certain health areas that met every need and training objective, and they provided after-work activities like mountain biking and corporate runs, as well as team sports in the business's sports hall, fitness and back training programs, dancing workshops, and relaxing activities, such as yoga and wellbeing classes. Participating in sports and being outdoors helped strengthen their team spirit. The company highlighted specific activities, including climbing, hiking, and skiing, among others.[637]

2021 Peak Performance

Peak Performance celebrated diversity by uniting vivacious, athletic, urban, and dynamic individuals. Because they believed that everyone's input contributed to their success, they valued individual personalities and skills. In addition, each employee contributed to the development of the most effective solutions for their products and the environment. Indeed, Peak Performance encouraged its employees to collaborate. They asserted that the company's performance was influenced by their values of togetherness, enthusiasm, and a winning spirit.[638]

For Peak Performance to reach their business objectives, high-performing staff were required. Therefore, the company established a People Strategy centered on *"strong leadership, stretch goals, a culture of feedback, and cross-functional collaboration."* The objective of the approach was to generate long-term business success and

637 Jack Wolfskin, 2021c
638 Peak Performance, 2021

recruit skilled, motivated individuals with a growth-oriented mindset into a high-performing work culture. Furthermore, the company always aimed for improvement. By integrating their capability for development with internal and external acquisition and development of talent, they constructed a future-fit organization.[639]

2021 Sierra Designs

Sierra Designs believed that social responsibility is demonstrated through the manner in which their gear was created and their active support of environmental causes (Fig 86.). Their CSR policy, the Exxel Outdoors Code of Conduct, has directed the company since 1995 to ensure ethical procedures, improvement of working conditions, and preservation of people's rights in factories where products are manufactured. Whether engaging with suppliers or offering peace of mind to stakeholders, such as employees, consumers, and the general public, social responsibility has been a top focus of the company.[640]

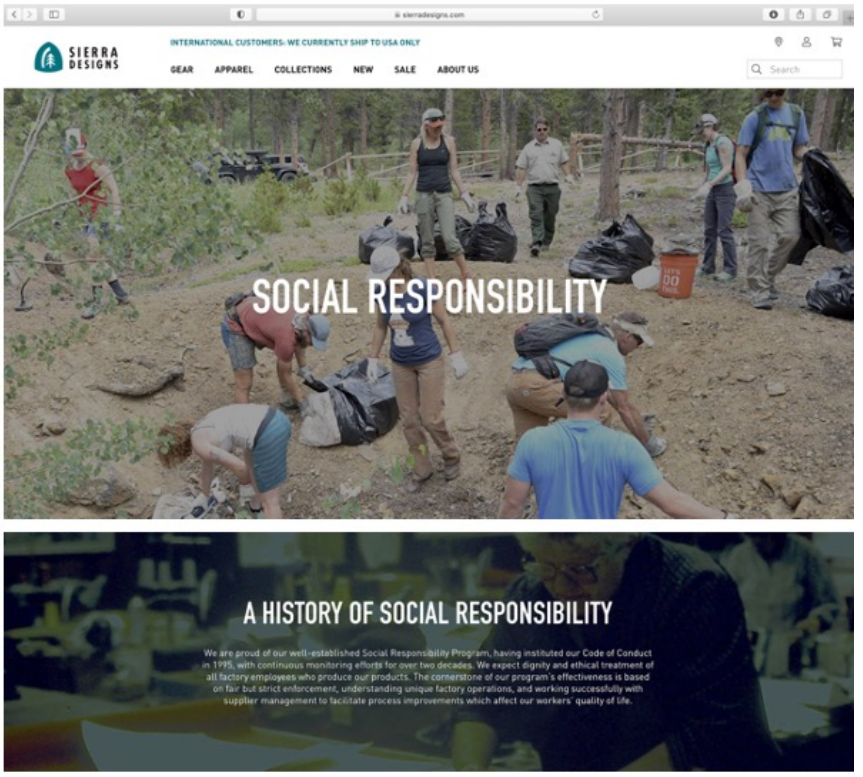

Figure 86. *Sierra Design's history of social responsibility dates back to the mid-1990s. (Sierra Designs, 2021.)*

639 Peak Performance, 2021
640 Sierra Designs, 2021

The brands looked at social responsibility from two different aspects. First, some companies have concentrated on how their suppliers' workers are treated. Few companies also discussed how they care for their own employees in the office. Since 2009 gender equality, a living wage, and work place safety has become more critical. The next section looks at stakeholders in the outdoor industry.

4.5 Stakeholders in the outdoor industry

Companies acknowledge that the progress is not made in isolation. These outdoor companies recognize the need to collaborate in order to make significant progress. This section looks at what the brands have mentioned about collaboration.

2021 Arc'teryx

Arc'teryx used the Higg Index of the Sustainable Apparel Coalition. As part of their commitment to supply-chain transparency, their monitoring strategy evolved constantly. They attempted to enhance practices and guarantee that their raw material suppliers adhered to best practices in the next tier of their supply chain. As a member of the Sustainable Apparel Coalition (SAC), in 2021, they advocated for *"audit convergence"* to empower the industry to move away from duplicate audits from multiple companies and instead focus on practical changes. In 2021, they began using the Higg Index Facility Social and Labor Module (FSLM) self-assessment with over 40 of their most important fabric suppliers.[641]

The Higg Facility Environment Module (FEM) is a management and data-tracking solution that enables providers to understand their operations better. As a result, 100% of Arc'teryx final product production partners and 75% of their crucial material suppliers reported using the Higg Facility Environment Modules.[642]

2021 Fjällräven

Fjällräven acknowledged that they did not operate in isolation. Instead, Fjällräven asserted that its objectives aligned with those of other outdoor brands. According to the company, many brands desire to enhance working conditions and lessen environmental impacts. Furthermore, they intended to combat malpractice and corruption. Fjällräven belonged to the Sustainable Apparel Coalition (SAC), in which over 80 participants shared information, including the most effective methods for reducing environmental and social impacts through membership.[643]

641 Arc'teryx, 2021a
642 Arc'teryx, 2021a
643 Fjällräven, 2021b

2021 Haglöfs

According to Haglöfs, numerous initiatives in the textile business served as benchmarks for their success. The company also created, developed, and launched programs to create benchmarks. Furthermore, collaboration was vital to Haglöfs (Fig. 87).

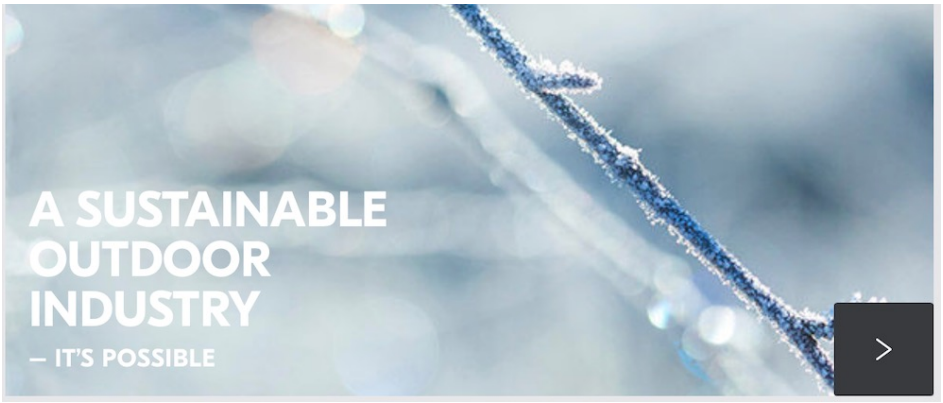

Figure 87. *Haglöfs believes in collaboration and a sustainable outdoor industry. (Haglöfs, 2021.)*

In addition to the obvious stakeholders, such as staff and owners, Haglöfs had numerous external stakeholders, the most significant of whom were consumers and merchants. Their stakeholders significantly impacted their activities, influencing all parts of the company, from assortment planning to sales. Beyond the supply chain, Haglöfs communicated with government agencies and authorities, municipalities, interest groups (NGOs), and the media, as well as their outdoor and fashion industry competitors.[644] Haglöfs communicated daily with many of their stakeholders on various concerns, an absolute requirement for resolving many of the world's most complicated sustainability issues. They believed that a truly sustainable future could only be achieved through frequent inter-disciplinary partnerships. Additionally, Haglöfs participated in several sustainability-related research and development projects. Examples of noteworthy partnerships and alliances include the following:

644 Haglöfs, 2021

- *"bluesign®*
- *Fair Wear Foundation (FWF)*
- *The Swedish Chemical Group (Kemikaliegruppen/Swerea)*
- *European Outdoor Group (EOG)*
- *Substitution in the practice of prioritized fluorinated compounds to eliminate diffuse sources (SUPFES)*
- *Scandinavian Outdoor Group (SOG)*
- *BioInnovation research project*
- *Sustainable Apparel Coalition/Higg Index (SAC)*
- *The Chemicals Agency textiles dialogues*
- *Microplastics research projects (several, with separate stakeholders)*
- *The Swedish Textile Water Initiative (STWI)*
- *The Sustainable Fashion Academy (SFA)*
- *The European Outdoor Conservation Association (EOCA)2021"*

645

2021 Jack Wolfskin

Jack Wolfskin believed that solving industry issues jointly is the way forward. By partnering with significant, like-minded partners in the apparel industry, the company aimed to obtain higher sustainability advantages with global suppliers than they could if they operated alone. Therefore, they joined numerous groups and organizations. For example, they became a member of the European Outdoor Group (EOG), a European organization of outdoor companies. This association, headquartered in Zug (Switzerland), drafted a sustainability charter for the outdoor industry, which outlined the association's objectives and commitment regarding ecology and environmental conservation. Jack Wolfskin was also a member of the Outdoor Industry Association's (OIA) Sustainability Working Group (SWG) in Washington, D.C., United States. The SWG comprised 150 outdoor industry businesses, suppliers, retailers, and other interest organizations whose shared objective was to implement enforceable criteria for ecologically sustainable and socially responsible supply chains.[646]

2021 Peak Performance

According to Peak Performance, no one is an island, even if they enjoy remote excursions. Thus, cooperation was vital to the company, and they believed in long-lasting relationships. They believed their personnel were essential for merging and developing the most effective solutions for their products and the environment.

645 Haglöfs, 2021
646 Jack Wolfskin, 2021d

Therefore, Peak Performance was committed to staff capacity development and collaboration in sustainability-related tasks, and they collaborated with others to affect and influence their suppliers favorably. They also collaborated with other brands, seeking a transparent supply chain of which all partners could be proud.[647]

Furthermore, Peak Performance collaborated with the Business Social Compliance Initiative (BSCI) to verify that their suppliers conformed to their code of conduct. Over 1300 businesses adhered to the BSCI's standard code of conduct. Sustainable Fashion Academy (SFA) taught students the information and tools required to develop and drive sustainable fashion ideas. "*The Sustainable Apparel Coalition (SAC) is a trade alliance of brands, retailers, manufacturers, government and non-governmental organizations, and academic experts representing nearly one-third of the global garment and footwear market.*" Peak Performance also participated in the Better Cotton Initiative, which it supported through the purchase of Better Cotton. By supporting BCI, the company helped make the cotton industry more accountable and sustainable.[648]

Several brands acknowledged that collaboration is essential. The brands belong to different organizations to gain and deliver information about the best practices. The next section looks at collaboration with other organizations.

4.6 Responsibility collaboration

The brands' responsibility activities significantly emphasized collaborating with various partners (Fig. 88.). In this section, I present a variety of important stakeholders and demonstrate how the brands communicated about those stakeholders.

647 Peak Performance, 2021
648 Peak Performance, 2021

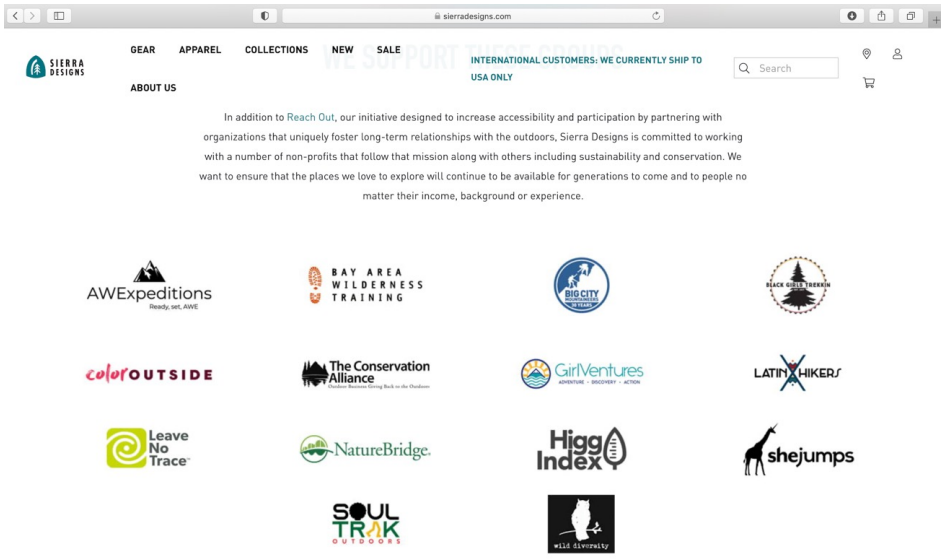

Figure 88. *Sierra Designs and many of the brands have published a list of their collaboration partners. (Sierra Designs, 2021.)*

Millet's responsibility team provides an example of internal and external communication. This team analyzed the entire product life cycle to minimize the environmental impact of the company's products at each stage. In addition, the team paid careful attention to the materials and their certifications. In 2004, they developed a label called Low Impact to improve communication on eco-design by utilizing resources with low environmental impacts, such as organic, recycled, and bio-sourced materials; water-free dyeing techniques; traceability of animal materials; humane treatment of farm animals; mulesing-free wool; and PFC-free water-repellent treatments. To develop responsible goods, they engaged closely with bluesign®, Oeko-Tex®, RDS, and GOTS to employ certified items.[649]

4.6.1 Bluesign®

2021 Arc'teryx

Arc'teryx was committed to sourcing the safest materials for people and the environment while ensuring ensuring its products' quality and performance. Technical outdoor textiles and components are often manufactured from synthetic materials and depend on active chemistry to accomplish their intended function, degree of performance, and durability. Using a rigorous materials compliance

649 Millet, 2009

program, Arc'teryx collaborated directly with the materials' providers to mitigate their harmful effects.[650]

The company also adopted the restricted substances list (RSL) of the bluesign® system, which identifies a variety of chemicals that necessitate cautious management due to their negative impacts on the environment, health, or workplace safety (Fig. 89.). Arc'teryx engaged their material suppliers directly to ensure that their entire supply chain adhered to these RSL standards.[651]

Figure 89. *Arc'teryx relies on RSL and services of bluesign. (Arc,teryx, 2021.)*

As a bluesign® system partner, they also chose to establish a third-party global textiles management system that mandated the use of safer, more environmentally responsible materials throughout their entire supply chain. Instead of attempting to restrict their products' outputs, the bluesign® system enables companies to choose safer inputs. The system comprises five primary focal areas: "*resource productivity, consumer safety, water emissions, air emissions, occupational health, and safety*".[652]

2021 Columbia Sportswear Company

The Columbia Sportswear Company was an official bluesign® system partner. Using a comprehensive approach to input stream management, bluesign® technology avoided environmental impacts across the supply chain by eliminating hazardous substances at the outset of the manufacturing process and regulating ecologically responsible and safe production needs. They aimed to manufacture safe and compliant goods

650 Arc'teryx, 2021a
651 Arc'teryx, 2021a
652 Arc'teryx, 2021a

from product conception to consumer delivery. To accomplish this, their Global Product Compliance team works directly with product development teams and manufacturing partners to ensure adherence to product requirements.[653]

Furthermore, they created a restricted substances list (RSL) based on international laws and industry standards and devised a testing methodology to ensure compliance with these rules. Additionally, the company provided significant training on their RSL and testing standards to their global partners, including their sourcing and manufacturing teams, to develop a thorough understanding of their RSL needs.[654]

The bluesign® system provided an independent, standardized solution for sustainable production and established standards via an input stream management system as well as certification of material production facilities. Moreover, Columbia Sportswear Company's restricted substance list was based on the bluesign® restricted substance list. The bluesign® system also ensured that textile production facilities and products adhered to demanding chemical specifications, thereby instilling consumer confidence in more sustainable products. In 2018, 50% of strategic material suppliers were bluesign® certified, and each year they continued to include more bluesign® components in their products.[655]

2021 Haglöfs

Since 2008, Haglöfs has also been a bluesign® system partner. According to Haglöfs, it is a stringent, voluntary initiative for textile manufacturers. Bluesign® restricted approximately 900 harmful chemicals to ensure a clean manufacturing process. In addition, the bluesign® system contributed to the responsible use of natural resources, minimized water and air pollutants, improved wastewater treatment, and reduced the product's overall ecological impact. Haglöfs planned to mark all of their new items with their Sustainable Choice accreditation and to eliminate all fluorocarbon DWR treatments from their materials.[656]

If fabrics are not certified as clean, determining which chemicals were utilized in their manufacturing and may still be present is impossible. Therefore, Haglöfs emphasized the quality and performance of its products. Additionally, Haglöfs aimed to minimize the negative environmental impact of each product as much as possible; this is the driving force behind all their actions.[657]

Certified materials are ones for which the creation is as follows:

- *"Natural resources have been used soundly and responsibly.*
- *Raw material has been limited.*

653 Columbia Sportswear Company, 2021b
654 Columbia Sportswear Company, 2021b
655 Columbia Sportswear Company, 2021b
656 Haglöfs, 2021
657 Haglöfs, 2021

- *Water and air emissions have been reduced.*
- *Wastewater treatment has been handled correctly and improved.*
- *The ecological footprint has been managed."*[658]

When Haglöfs converted these materials consisting of at least 90% bluesign®-approved fabric and at least 30% bluesign®-approved accessories into their products, those products could be classified as bluesign® products. Indeed, the majority of Haglöfs' textile products were bluesign® certified, placing the company at the forefront of their industry. In 2008, Haglöfs became a bluesign® system partner. Since then, they have endeavored to ensure that their material suppliers adhere to the system's specifications.[659]

2021 Houdini

Houdini was also a member of bluesign®, and they demanded that all new manufacturers comply with the bluesign's® chemical specifications. Bluesign® is a standard that simultaneously considers human rights, human health, chemical usage, and the safety of consumers. The bluesign® standard provides assurance that approved goods and manufacturing processes did not include any components that might be harmful to either humans or the environment.[660]

2021 Jack Wolfskin

To achieve safe and environmentally responsible production methods, Jack Wolfskin was also a bluesign® system partner. The independent bluesign® system for sustainable textile production incorporates worker safety, consumer protection, resource conservation, and the prevention of water and air pollution. As mentioned above, the concept behind bluesign® is its input stream management, which prohibits the use of dangerous chemicals prior to production and independently monitors the manufacturing process. It ensures the health and safety of workers throughout the entire production process, as well as environmental preservation and resource conservation.[661]

2021 Millet

Millet argued that bluesign® Approved Fabrics ensured the stringent traceability and safety of the chemical compounds utilized in the production of their products (Fig. 90.).

658 Haglöfs, 2021
659 Haglöfs, 2021
660 Houdini, 2021b
661 Jack Wolfskin, 2021a

Figure 90. *Millet was bluesign® partner and has concentrated on PFC free DWR. (Millet, 2021.)*

bluesign® required a safe manufacturing method, as well as a safe workplace, and customers who are safe. The bluesign® standard has been met by more than sixty percent of Millet's offerings.[662]

2021 Patagonia

Since 2000, Patagonia has partnered with bluesign® technology, and in 2007 it became the first brand to join the bluesign® system partner network (Fig. 91.). bluesign® assisted Patagonia in assessing and decreasing resource consumption. In addition, bluesign® facilitated the management of chemicals, dyes, and finishes by improving environmental performance. Consequently, for the spring 2021 season, nine of their top ten material suppliers were bluesign® system partners and used bluesign®-approved chemicals. Their success and enthusiasm encouraged additional suppliers and brands to join the network. The example set by Patagonia has inspired nearly one thousand businesses, manufacturers, and chemical suppliers to join the bluesign® system.[663]

662 Millet, 2021
663 Patagonia, 2021a

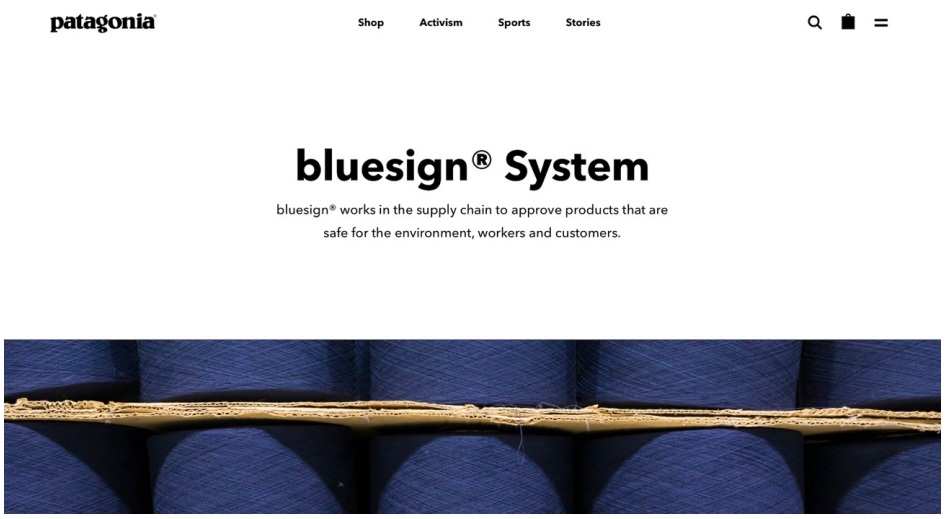

Figure 91. *Patagonia has been an industry leader in terms of their work in partnership with bluesign®. (Patagonia, 2021.)*

4.6.2 Fair Labor Association

2021 Arc'teryx

Arc'teryx asserted that their employees are the foundation of their business, enabling the creation of their products. Furthermore, Arc'teryx argued that human rights should be respected wherever its products are manufactured. Their parent company, Amer Sports, was accepted as an associate member of the Fair Labor Association (FLA) in June 2020, which offered their social compliance program third-party accreditation to ensure workers' access to education, training, and engagement opportunities. FLA standards require improved planning and communication, as well as the reduction of negative effects on manufacturing floor employees. Full accreditation takes several years and necessitates new ways of thinking, as well as reorganization of all systems to fulfill these stringent requirements. Beginning in 2021, Arc'teryx shared FLA-approved social compliance audits of their manufacturing plants as evidence of their learning experience.[664]

2021 Fjällräven

Fjällräven joined the Fair Labor Association (FLA) in 2013. The FLA is a multi-stakeholder organization that improves worldwide working conditions and supports workers' rights. It has allowed Fjällräven to enhance its global approach to

664 Arc'teryx, 2021a

ethical sourcing. The company also signed the UN Global Compact, a collaboration between corporations and the United Nations. Members pledge to align business operations and plans with 10 internationally acknowledged values of human rights, labor, anti-corruption, and the environment.[665]

2021 Patagonia

Patagonia began developing a social responsibility program with the assistance of their suppliers in the mid-1990s. In 2001, they were one of the Fair Labor Association's founding members. Patagonia is aware that the legal minimum wage may not be sufficient for supporting an appropriate level of living, which is a prerequisite for a living wage. Therefore, they have promoted overtime pay and statutory benefits.[666]

Patagonia argued for conducting an extensive study on living wages and discussing the issue with other brands, nongovernmental groups, and living-wage organizations (Fig. 92.). The United Nations and its International Labor Organization (ILO) have declared that a living wage is a fundamental human right. Therefore, Patagonia has agreed to endorse the Global Living Wage Coalition's (GLWC) concept of a living wage, as follows: *"The remuneration received for a standard workweek by a worker in a particular place is sufficient to afford a decent standard of living for the worker and her or his family."*[667]

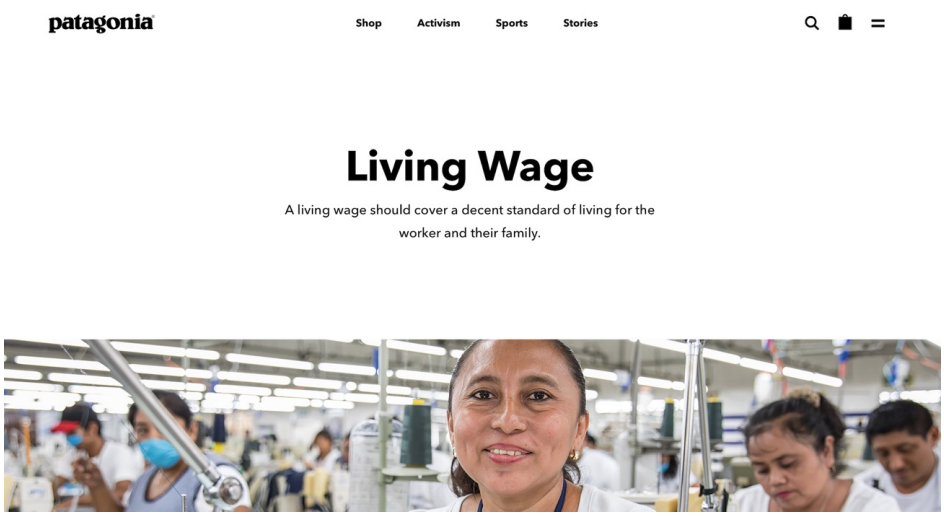

Figure 92. *Patagonia has been a strong supporter of the living wage movement. (Patagonia, 2021.)*

665 Fjällräven, 2021b
666 Patagonia, 2021b
667 Patagonia, 2021b

Patagonia argued that food, water, housing, education, health care, transportation, and clothing should be covered by a living wage as evaluated by region using the 2017 Anker methodology. Patagonia has benefited from using the Anker methodology. Furthermore, the company stated that they have been constructing a Fair Labor Association dashboard that enables them to assess living wages accurately. Patagonia has also incorporated the living wage requirement into its code of conduct. Finally, the company studied alternative methods of supporting their suppliers' employees in the event of an economic or climatic crisis, thereby creating safety nets for those employees.[668]

4.6.3 Fair Trade Certified

2021 Arc'teryx

Since 2020, Arc'teryx has supported its production facilities through the independent, third-party Fair Trade Certified program to empower people by giving them supplemental revenue that can be used to enhance their standard of living (Fig. 93.). Fair Trade Certified products safeguard workers' rights, health, and safety. In addition, Fair Trade premiums produce a worker-controlled fund that employees use collectively to obtain actual in their life. By purchasing Fair Trade Registered items from a certified manufacturing facility, Arc'teryx provides safe working conditions that protect their employees' health and pays additional premiums for each transaction. Employees can collectively select how that additional premium is spent.[669]

Figure 93. *Arc'teryx produces its garments globally and expects its suppliers to join the Fair Trade Certified program. (Arc'teryx, 2021.)*

By 2025, Arc'teryx expects that 80% of its products will be Fair Trade Certified. According to the company, this is one of the many necessary steps to restructure garment supply chains. Fair Trade Certified is a method for enhancing workers'

668 Patagonia, 2021b
669 Arc'teryx, 2021a

conditions. To prioritize the well-being of workers through fair salaries and social benefits, supply networks must be drastically redesigned. Arc'teryx argued that they are also accountable for the impact of their decisions on workers in the supply chain and thus aimed to foster better sustainability awareness among upstream decision-makers. They were aware that their last-minute design changes or adjustments to predictions affect people's working circumstances.[670]

Arc'teryx argued that the industry's minimal standard must be raised, and that this cannot be accomplished alone. They wished to encourage and engage their industry peers, governments, financial institutions, and others to participate in a collective conversation for the benefit of the people at the center of their business. They asserted that they did not have all the answers necessary to alleviate global inequalities in the apparel business rapidly. Systemic change does not come with a how-to guide and involves the best efforts of numerous actors, including consumers, brands, regulators, and policymakers, all of whom work toward a shared vision. As issue solvers and design thinkers, Arc'teryx pledged to participate in this work and continue to update this area as their knowledge and influence expand.[671]

2021 Patagonia

Patagonia did not own the factories that manufactured its garments and therefore had minimal influence over the wages of the factory employees. However, they provided these workers with genuine benefits that improved their lives through Fair Trade (Fig. 94.). Since 2014, Patagonia has manufactured Fair Trade apparel, and the company claimed to have more Fair Trade products than any other apparel brand. The Fair Trade program allows an employee committee to select how excess funds will be used.[672]

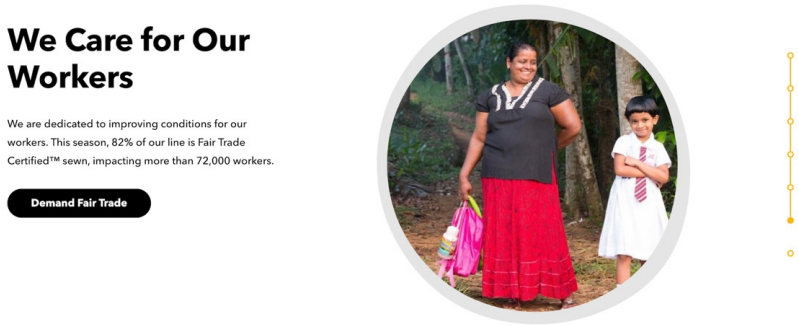

Figure 94. *Patagonia trusted in the Fair Trade Certified program to improve the working conditions of its suppliers' employees. (Patagonia, 2021.)*

670 Arc'teryx, 2021b
671 Arc'teryx, 2021a
672 Patagonia, 2021c

Patagonia offered examples of Fair Trade Certified benefits, such as healthcare programs, child care centers, access to products employees could not otherwise purchase, and monetary incentives. In addition, the Fair Trade Certified program improves worker health and safety, environmental compliance, and worker-management communication. Patagonia continued their efforts to find a lasting solution to ensure that all workers who create their garments receive a living wage. According to Patagonia, only a handful of outdoor enterprises are committed to Fair Trade, despite the fact that 75% of millennials desire such products.[673]

4.6.4 Fair Wear Foundation

2021 Haglöfs

Environmental and social sustainability were equally essential to Haglöfs, who was a member of Fair Wear for this reason. Haglöfs' commitment to Fair Wear necessitates routine, comprehensive third-party audits of their manufacturing facilities, transparent grievance procedures, and official performance reporting. Fair Wear is widely regarded as the most demanding independent supply chain monitoring standard available on the market, and the work of Fair Wear is based on eight guiding principles that Haglöfs adopted as their own "Code of Labor Practices."[674]

2021 Jack Wolfskin

Jack Wolfskin was also a member of the Fair Wear Foundation, a non-profit organization whose mission was to improve working conditions in the textile and apparel industries. The company traditionally relied on long-lasting and strong partnerships with their suppliers and thus could strive toward collaboration improvement methods. Annually, the Fair Wear Foundation publishes an online Brand Performance Check. Since 2015, Jack Wolfskin has achieved a Leader designation with the FWF because they monitor 100% of their supply chain, cooperate effectively with their suppliers, and meet certain criteria.[675]

Annually, Jack Wolfskin also produces a comprehensive social responsibility report outlining their efforts to create more humane, equitable, and secure working conditions. They describe their accomplishments and the obstacles they must overcome in their global supply chain, including specifics on how their manufacturers have implemented the required social standards and the potential for improvement.[676]

673 Patagonia, 2021c
674 Haglöfs, 2021
675 Jack Wolfskin, 2021d
676 Jack Wolfskin, 2021d

4.6.5 Forest Stewardship Council

2021 Patagonia

Patagonia catalogs are produced on FSC®-certified paper, and the company sources FSC®-certified raw materials for certain products. Patagonia noted that forests are crucial for carbon storage, water filtration, ecosystem preservation, and food security. Despite the significance of forests, however, they have been rapidly depleted and inadequately managed. Therefore, Patagonia has backed numerous forest protection and restoration initiatives, using Forest Stewardship Council (FSC)-certified paper, natural rubber, and other raw materials since they employ wood-derived components. Since 2014, Patagonia's catalogs have been printed using 100% post-consumer recycled paper that is FSC-certified. Patagonia also sourced FSC-certified raw materials for some of its apparel and equipment. Since 2016, when they began incorporating natural rubber into their Yulex® wetsuits, they have verified that the rubber is Rainforest Alliance FSC-certified.[677]

This section looked at collaboration with several organizations. The brands acknowledged openly that they need these organizations' expertise. This findings chapter examined the brands' responsibility and sustainability practices holistically and provided a detailed analysis of the state of affairs in 2021 as well as the evolution since 2009. A discussion and analysis of overarching themes and developments are presented in the next chapter.

677 Patagonia, 2021d

5 DISCUSSION AND CONCLUSIONS

This chapter begins with a discussion of the results and then continues with ethical considerations and the perceived impact of the research. Finally, this study ends with conclusions and suggestions for further research.

5.1 Summary of the key findings

The summary of the key findings follows the same order as previously presented. First, outdoor clothing design is discussed. Then, the key issues affecting the outdoor clothing industry are discussed. The third section discusses the results of environmental responsibility, followed by a discussion on social responsibility. Finally, a discussion about stakeholders in the outdoor industry and responsibility collaboration is presented.

5.1.1 Outdoor clothing design

The criteria for effective outdoor clothes are diverse. Users anticipate and require quality, durability, and performance, and decisions regarding sustainability are also considered during the design phase. Several of the brands had already revealed their design philosophies in 2009. For instance, Arc'teryx recognized that producing high-quality items was the most environmentally friendly practice. Additionally, Fjällräven declared that items that are durable, functional, and safe are the most environmentally beneficial. Almost all the brands also provided comparable information. Houdini appropriated the Bauhaus movement motto, *"form follows function,"* which signifies that design is based on activity. In 2009, therefore, all forms of usefulness and quality were assessed. In 2005, Ruckman conducted research on a three-layer system for outdoor clothing and found that a great deal of testing should be performed to determine the appropriate combination of textiles for the base, middle, and outer layers.[678] According to the findings of my research, technical clothing designed for the outdoors is distinct from everyday clothes in that its design is more complex and thorough.

In 2021, several firms had incorporated information regarding their design philosophies that focused on environmental friendliness. For example, Fjällräven built a model that exemplified numerous fundamental design ideas. The principles

678 Ruckman, 2005, 129

included user-centered design, utility, simple usability, simple design, durability and efficiency of materials, emotional design, the capacity to recycle garments, avoidance of unnecessary alterations to well-functioning items, and testing. Similarly, Abreu et al. created a framework for sustainable solutions that included the following key elements: a business model for sustainability, collaboration, business credibility, responsible business, traceability, transparency, accountability, and disclosure.[679] Previous studies as well as my research have revealed that the concept of responsibility is diverse, complex, and multi-dimensional.

Emotional design is based on the idea that the person who wears the garment will take better care of it, hence increasing the garment's longevity. Peak Performance wished that their clients would make a permanent place for Peak Performance garments in their closets. What inspires customers to remain loyal to a business over time are designs that are not only practical but also timeless. Michel et al. studied consumers' motivation to engage in sustainable acts regarding their Patagonia clothes and found a few distinct reasons why the user wants to take care of the clothing. These reasons included an emotional link to the outfit as well as recollections connected to earlier events involving the item.[680] According to my results, the brands performed several actions to increase user engagement, among which were ensuring quality and offering repair services and care tips.

5.1.2 Key issues affecting the outdoor clothing industry

Long supply chains are one of the most prominent factors affecting the outdoor clothing business. Technical outdoor clothing necessitates highly functional textiles, which are frequently produced by a separate manufacturer from the one who sews the garment. One of the brands with a local manufacturer was Arc'teryx. However, the majority of production occurs in the Far East, whereas brand headquarters are located in Western nations. Each phase of the supply chain includes transportation and packaging, as well as an auditioning process.

Supply chain management (SCM) is a well-established concept, but responsible and sustainable supply chain management (RSCM and SSCM) are new concepts. Environmental and social responsibility can be affected by supply chain management's impact on air and water pollution, chemical usage, waste, and ethical working conditions. The environmental, social, and economic responsibilities that should be considered across the supply chain are referred to as the triple bottom line according to Shen et al..[681]

For solutions to manage the supply chain properly, brands have joined the Sustainable Apparel Coalition and other standards. Fair Trade, Fair Wear, and

679 Abreu et al., 2021, 1622
680 Michel et al., 2019, 171
681 Shen et al., 2017, 1

bluesign® were among the partners that helped firms ethically manage their supply chains. One component of RSCM is a code of conduct. Since 2009, the brands have disclosed their suppliers and the origin of their fabrics. Houdini and Jack Wolfskin, for instance, provided an opportunity to research their production partners. Börjeson and Boström stated that bluesign® provides the ability to outsource time and knowledge.[682] This is the case with all responsibility organizations: brands can gain expertise that would otherwise take a long time to gain. Borjeson and Bostrom claimed that bluesign® is a method to outsource both time and expertise. [683]

Haglöfs also mentioned slavery in the apparel sector, stating that they do not allow it at any stage of manufacturing. Multiple brands indicated that they frequently audit their plants and employ third-party auditors, and transparency was mentioned repeatedly. In addition, the companies highlighted their longstanding ties with suppliers. There were several reasons for these long-term relationships. First, learning how to create well-functioning items takes a long time, and second, building a responsible production and supply chain also takes time. Various research studies have focused on many aspects of supply chains, including some from social and environmental perspectives. Because of the violations that have occurred, human rights and public safety have become major sources of concern.[684]

Raising awareness of environmental issues is one of the most significant trends of the past decade. According to Giannakis and Papadopoulos, a rising level of customer awareness is one of the primary motivating factors behind companies' embracing responsible business practices and collaborating with responsibility organizations.[685] My analysis indicated that only Haglöfs emphasized climate change in 2009. In 2021, however, numerous brands had addressed the issue and made subsequent adjustments. The brands had calculated their carbon footprint accounting for transit methods, and renewable resources and textile recycling were suggested by the brands as solutions to the climate challenge. A significant number of studies have been conducted on the topic of climate change, and the IPCC was established to analyze it. However, I was unable to locate significant research that had concentrated specifically on the relationship between climate change and outdoor apparel. The European Outdoor Group discussed their vision in their annual report and also established a working group specifically for it.[686]

682 Börjeson & Boström, 2018, 237
683 Börjeson & Boström, 2018, 237
684 Abbasi, 2017; Börjeson & Boström, 2018; Hohn & Durach, 2021; Shen et al., 2017; Xu et al., 2019
685 Giannakis & Papadopoulos, 2016, 455
686 European Outdoor Group Annual Report 2012, 2021; Intergovernmental Panel on Climate Change, 2022a, 2022b

5.1.3 Environmental responsibility

Environmental responsibility is divided into materials, animal welfare, use, and end of use. Because garments are made of materials, material production has an enormous influence on environmental responsibility. The choice of raw materials impacts chemical use during production, water use and contamination, and the end-of-life method. In their 2015 study, Laitala, Boks, and Klepp concluded that the selection of materials does, in fact, have a general effect on durability and environmental sustainability.[687]

The brands typically offered a vast amount of information on the materials they used. However, in 2021, as opposed to 2009, the brands also informed users about the environmental downsides of the materials. As a result, the amount of knowledge users could obtain from the brands' web pages was remarkable. The brands discussed differences, including the benefits and disadvantages, of natural and man-made fibers. For example, cotton is the most popular natural fiber, but its conventional production uses a significant amount of water and chemicals. Patagonia has concentrated on organic cotton, and the other brands also mentioned it. One way to assess environmental impact of the products is to use the Sustainable Apparel Coalition's Higg Index, which Khan and Islam used in their study in 2009.[688]

The new phenomenon apparent after 2009 is microplastic pollution. Micropieces of synthetic fibers leak into rivers and oceans, causing water life and human health hazards. The quality of fabric and washing practices can impact this leakage. Dalla Fontana, Mossotti, and Montarsolo conducted a study in 2021 to investigate the emissions of microplastics during washing and found that it is a growing problem that requires attention.[689] Numerous companies had become aware of the issue and have also provided their customers with an informative description of it. Additionally, they recommended laundry bags, which were sold at least by Houdini.

Many of the brands mentioned a restricted substance list (RSL) and bluesign® as the industry leader to help solve the complex problem. Chemicals are used in dyes and finishes. Haglöfs presented its interest in environmentally friendly dyes. Per- and polyfluorinated chemicals are also a significant problem for the outdoor clothing industry, and pressure from NGOs has forced the brands to look for alternatives. However, the change from long-chain PFC to short-chain PFCs has been gradual. Fjällräven, Houdini, and Jack Wolfskin had phased out fluorocarbons. However, they faced the problem of the alternatives' lesser functionality. Greenpeace has emphasized fluorocarbons and targeted the outdoor industry, and it may have impacted brands' actions and motivation to find alternatives.[690]

687 Laitala et al., 2015, 104
688 Khan & Islam, 2015, 11
689 Dalla Fontana et al., 2021
690 Greenpeace, 2017, 2018

Jack Wolfskin mentioned avoiding nanoparticles because their impacts are unknown. Arc'teryx and Haglöfs had innovated their own anti-odor treatments that they claimed to be healthier. Jack Wolfskin had created its own mosquito-proof fabric and UV protection fabric, which Patagonia had also created. According to Shah et al., the use of nanotechnology may provide additional benefits. Nevertheless, the technology carries potential risks to both human health and the natural environment.[691]

Another main difference between 2009 and 2021 was the brands' interest in animal welfare. The two most crucial animals were goose and sheep; down and merino wool have excellent properties, and outdoor clothing brands are keen to use these materials. The challenge with geese is live-plucking and force-feeding. The Responsible Down Standard is an adopted system that ensures the ethical treatment of geese. However, the down supply chain is complex, and the brands desired to increase transparency. Mulesing is the main issue for merino sheep, as this technique causes pain for the sheep. Therefore, the Responsible Wool Standard was created to ensure the humane treatment of sheep. Animal rights are sensitive topics in which users are interested. The work of animal rights NGOs has increased awareness. For instance, PETA has been active in the fight for animal rights and has helped raise awareness among consumers about animal abuse.[692]

The brands had also realized that the user has an enormous impact on environmental sustainability. As a result, many brands had published caring and repairing instructions. For example, Houdini had separate directions for different textile and garment types. A new phenomenon that was nonexistent in 2009 was garment libraries and rental programs. Houdini mentioned that these techniques increased its business without increasing production. Use-oriented product-service systems, or u-PSS, were the subject of research conducted by Borg, Mont, and Schoonover in 2020. They projected that u-PSS will emerge as a legitimate alternative to traditional ownership models for consumer goods.

To increase sustainability, the concept of a circular system has been well established, and in an ideal world, the garment would be made from recycled material and would be recyclable. The book *Cradle to Cradle: Remaking the Way We Make Things* by McDonough and Braungart, published in 2002, is considered a classic text on the topic of circular economic models. The authors of the book proposed that all products made by humans should be either recyclable or biodegradable.[693] Subsequently, new composting processes for used clothing have been developed over the course of the last 10 years. In addition, many companies provide their customers

691 Shah et al., 2016, 13
692 People for the Ethical Treatment of Animals, 2022
693 McDonough & Braungart, 2002

the opportunity to recycle, and they urge their customers to reuse items whenever possible. The results of the study concerning social responsibility are discussed in the following section.

5.1.4 Social responsibility

Over the last decade, concern regarding social responsibility has risen. One of the reasons being tragic happening in Bangladesh. The health and safety of the workforce is an essential component of social responsibility. Existing ideas of human rights serve as the foundation for discussions about social responsibility concerns, including a living wage, freedom of association, modern slavery, forced labor and child labor, and health and safety.[694]

The brands had taken two approaches to this problem on their websites. Some discussed the employees working in their headquarters, while others discussed the employees working for their suppliers. For instance, Jack Wolfskin and Peak Performance emphasized the importance of a healthy work-life balance and working together as a team with their employees. In contrast, Columbia and Haglöfs addressed difficulties in the supply chain.

Columbia raised issues related to gender, and they developed a program specifically for women. On their website, Columbia mentioned at least three types of obstacles that women face. A strong correlation exists between gender and challenges in the areas of health, finances, and respect. Because women make up the vast majority of garment workers, gender is an important factor to consider. Education of women, as well as the men who work alongside them, can empower women to negotiate their salaries and combat discrimination in the workplace. In the garment industry, gender-based inequality is a well-known problem that has also been the subject of research. For instance, Brown conducted a study on the topic in 2021 and concluded that the corporate social responsibility programs of companies are ineffective because these programs fail to acknowledge improper and oppressive working conditions.[695]

Haglöfs argued that it is impossible for one company to overcome the problems associated with social sustainability, which is why the company had joined Fair Wear. Fair Wear publishes audit results on an annual basis, so when businesses join, they do so with the knowledge that they are assuming a degree of risk. However, Fair Wear encourages brands to act and raises the level of transparency. Haglöfs also discussed modern slavery and the use of forced labor. Patagonia mentioned that they had performed extensive research about the living wage and supported the Anker methodology, which determines the real living wage according to location. According to the findings of my research, the topic of CSR was discussed in the

694 amfori BSCI, 2017
695 Brown 2021, 118

literature in relation to fast-fashion firms and much less in relation to outdoor clothing production.[696]

Both the North American brands, Arc'teryx and Patagonia, were members of the Fair Trade Certified system, and both considered it the most effective corporate social responsibility (CSR) mechanism currently available. Jack Wolfskin and Peak Performance both emphasized the need for staff who are enthusiastic and motivated. Jack Wolfskin emphasized, in particular, the significance of bringing body and mind into harmony. The principles of togetherness and competitive drive were emphasized by Peak Performance. A discussion on the results relating to stakeholders and responsible collaboration in the outdoor clothing industry is presented in the following section.

5.1.5 Stakeholders and responsibility collaboration in the outdoor industry

The brands all agreed that the problems facing the industry are so complicated that it would be difficult for any one company to fix them on its own. The brands cited several forms of collaboration, such as those with industry associations, other brands, standards, not-for-profit organizations, and non-governmental organizations (NGOs). Additionally, many brands publicized the names of their collaborative partners on their website. For instance, Haglöfs provided an alphabetical list of their collaborators.

The role of the industry associations as makers and forums for collaboration is an important one. Organizations such as the European Outdoor Group and the Outdoor Industry Association provide essential knowledge and offer assistance to brands dealing with essential problems. In addition, the brands were members of several working groups associated with industry associations, and they interacted on a voluntary basis with competitor brands. Another venue for collaboration is the Sustainable Apparel Coalition, and all the participating brands utilized the Higg Index to evaluate and improve their supply chains.

A significant amount of the responsibility work was based on non-profit organizations and voluntary labeling schemes. This was partly because the legislation in supplier countries is not as stringent as the legislation in Western countries. The growing awareness of customers, the persistent stream of negative attention from NGOs, and the business ethics of the brands were the primary factors driving the adoption of ethical practices. A variety of labels and standards presented the brands with opportunities for third-party auditing for a variety of responsibility concerns. For example, bluesign® seemed to be the system that was used the most frequently for chemical management in the supply chain. Over the past 10 years, awareness on the rights of animals has grown, and responsible behavior standards have been developed for animal welfare. Patagonia particularly was responsible for establishing standards

696 Pan & Holland, 2006; Rafi-Ul-Shan et al., 2018; Tucker, 2008

and then recommending them to other brands; my search of the available literature revealed that Patagonia was, by far, the outdoor clothing brand that received the greatest attention from academic authors.[697]

Furthermore, the past 10 years has witnessed a greater emphasis on social responsibility. In particular, Fair Trade Certified and the Fair Wear Foundation have been helpful in enabling brands to develop codes of conduct by providing feedback and recommendations for further development. The findings also demonstrated that an effective and close working relationship has the potential to alter circumstances and difficulties rapidly. Thus, many topics, including climate change, emissions of greenhouse gases, organic production, microplastics, PFCs, and social responsibility concerns, have undergone significant development over the last decade.

5.2 Ethical considerations

This research is a qualitative case study, and specific requirements must be fulfilled to assess qualitative research. One of the most cited papers on criteria for research evaluation is Guba's 1981 article. Guba suggested four aspects that impact trustworthiness: internal validity, external validity, reliability, and objectivity.[698] In 2016, Mårtensson et al. created an extensive and informative chart for research quality. They divided research quality into four aspects, stating that research should be credible, contributory, communicable, and conforming. First, credible implies research that is *rigorous, consistent, coherent, and transparent*. Second, contributory includes *original, relevant, and generalizable research*. Third, communicable comprises *consumable, accessible, and searchable research*. Finally, research must be *aligned with regulations, ethical, sustainable, and conforming.*[699]

Trustworthiness and credibility

According to Cope (1994) and Sin (2010), Guba and Lincoln introduced four-part criteria for trustworthiness: *credibility, dependability, confirmability, and transferability*. In 1994, Lincoln and Cuba added authenticity.[700] In 2010, Sin addressed and clarified the four-dimensional criteria of Lincoln and Cuba as follows: the concept of credibility encompasses the aspect of the findings' truthfulness and entails comparing the findings to the varied data sources. Fittingness refers to the applicability of the results to different settings. Auditability is concerned with the consistency of the findings if the study is repeated, while confirmability is

697 Michel et al., 2019; O'Rourke & Strand, 2017
698 Guba, 1981, 76
699 Mårtensson et al., 2019, 599
700 Cope, 2014, 89; Guba & Lincoln, 1994, 114; Sin, 2010, 307

concerned with the independence of the findings from the researcher's biases and aims.[701] Mårtensson et al. defined the term *credible* as follows: *"Research is coherent, consistent, rigorous and transparent."* According to them, rigorous means that *"research is contextual, internally valid and reliable."*[702]

Internal validity

Internal validity seeks to answer whether a conclusion can be supported by the evidence if it involves a causal relationship between two or more variables.[703] According to Guba (1981), the naturalistic term for internal validity is credibility.[704] Mårtensson and others have defined internally valid as *"a correct scientific method [that] is used in relation to the question at hand and context, and new knowledge [that] is provable."*[705] This research examined how outdoor brands communicated their sense of responsibility on their websites. The data sample was chosen because it covered all companies equally and was identical. Companies have released responsibility reports and social media marketing in recent years, but those were excluded for reasons stated previously. The technique used for data collection and analysis was appropriate for this subject matter, and thus the analysis was rigorous.

External validity

The basic concern of external validity is whether the findings of a study can be extended to settings other than the one in which the research was done. External validity may be applicable to qualitative research; however, the issue of the representativeness of study participants falls under the purview of quantitative research.[706] According to Guba, the naturalistic term for external validity is transferability.[707] This is a subject worthy of consideration. The present research was a case study of 12 outdoor clothing companies. Thus, the results cannot be extrapolated to the entire outdoor industry. Rather, they reflect recent trends and events over the past decade. .

Transferability

According to Cope (2014), a qualitative study fulfills transferability if the results are meaningful to participants who were not part of the study and readers can relate the results to their own experiences. Researchers should offer adequate information about the informants and study setting for the reader to evaluate the applicability or

701 Sin, 2010, 307
702 Mårtensson et al., 2019, 599
703 Bryman, 2012, 32
704 Guba, 1981, 80
705 Mårtensson et al., 2016
706 Bryman, 2012, 33
707 Guba, 1981

transferability of the results.[708] In this research, the companies that produce outdoor clothes served as the object of the study. These companies were comparable to other brands in the same industry.

Reliability and replication

Whether the findings of an experiment can be replicated is central to the concept of reliability. According to Bryman, it is mostly connected to quantitative research.[709] Mårtensson et al. defined the term *reliable* similarly: *"The chosen scientific method is appropriate for the present question at hand and context, and is documented in a described procedure that others could use to reach a similar result in the same context."*[710] In theory, this study could be replicated in a different timeline.

Next, I will discuss this research while focusing on several aspects of the research's quality. My study investigated responsibility and sustainability in 12 outdoor companies through their communication on their company web pages. The brands were initially selected in 2007 when I began the initial phase of the study. At the time, sustainability actions in companies were much rarer than at present. However, in 2007, these 12 brands had already mentioned sustainability. The brands varied from global industry leaders to smaller brands—a gap which has grown over the past decade. For example, howies and Sierra Designs have not added much information regarding their responsibility actions. In my view, the research is coherent, consistent, rigorous, and transparent. Both the research method and the results of the study are appropriate and capable of being replicated. I have ensured that the study is consumable, which means that it is well organized, clear, and easily readable.

This study concentrated only on public websites. Some companies also publish responsibility reports, but these were excluded for the sake of equal comparison. All the data that were used had already been posted online and were accessible to the general public. As a result, the point of view considered throughout this study was that of an informed customer. However, the accessed information was only that which the companies chose to communicate and obviously does not provide knowledge of ongoing initiatives not yet released. Companies are concerned about receiving unfavorable publicity, assaults from NGOs, and negative customer opinions, which drives them to reveal information only after they have successfully overcome obstacles. One illustration of this would be the efforts made by the working groups of various trade organizations. Therefore, the brands may have worked tirelessly for a cause over the course of many years, but this may not be highlighted by this research if the company did not promote it publicly. Similarly, true responsibility issues faced by the businesses are not considered in this research since the brands did not communicate

708 Cope, 2014
709 Bryman, 2012, 31
710 Mårtensson et al., 2016, 599

these issues openly on their websites. Rather, this study interpreted an original idea in a novel way. It was transparent, and it communicated how the data were collected.

In fairness, I cannot access information about social responsibility violations, such as forced labor or the environmental hazards the brands may have caused. The brands collaborated with several organizations to audit their supply chain, but this information was not often publicly available and was considered a trade secret. To guarantee that the data were comparable, I utilized the standard method for collecting information: taking screenshots of the various brands' websites on the same day. Using the NVivo coding program, the data were structured and coded after being organized. The data uncovered recurring trends and ideas, both of which I made use of while structuring my research. As a result, an inductive methodology was utilized for this study.

Interviewing the people who work for the outdoor companies was another strategy that might have been taken, but viewing the websites provided the same information about each business. However, the findings of this research do not indicate the objective reality of what the businesses have done in terms of responsibility and sustainability. This study is not on the sustainability accountability of these outdoor companies; rather, it is a study about communication and public issues.

One viewpoint on clothing sustainability is consumer attitudes, behavior, and concerns. These could be researched, for example, in social media. When I initially began my research in 2007, social media was not used as it is currently. For comparability, I decided to use the same data source. User behavior research on social media is one possibility for further research.

In conclusion, this study adhered to the standards, which means that it was ethical and transparent. It provided evidence of transparency in relation to the manner of data gathering and analysis. Because it investigated public websites for outdoor companies, ethical approval or consent was not required.

5.3 Impact of the research

The outdoor clothing industry is undeniably faced with difficult challenges in terms of responsibility and sustainability. Additionally, the level of customer awareness and the brands' values have changed over the past 10 years. Furthermore, both the information on the challenges that have been encountered as well as the expertise regarding the potential solutions have increased. For example, the topic of microplastics was completely absent from discussions 10 years ago. Additionally, fluorocarbons and animal rights are becoming increasingly important factors that users consider when they purchase clothing for outdoor activities.

The leading brands of outdoor clothing have been working on these responsibility concerns for at least the past decade, if not for much longer, and this research did not

provide any new information of which these brands are not aware. However, this work is of significant use to brands that are not that far along in their development. It is also of considerable use to individual designers who must comprehend the complexity of the process of designing outdoor clothing responsibly.

This research combines a substantial amount of data on responsibility issues and stakeholders. The developments presented herein represent a timeline that spans over a decade. The passage of time has shown that continuous progress is required from brands. On their websites, a number of industry pioneers have compiled extensive subject matter resources related to corporate responsibility for the benefit of their customers, the environment, and workers in the industry. These actions have inspired others to follow in their footsteps and replicate their progress.

The results of this study also impact the development of a more comprehensive understanding of the subject. The effects of climate change, the difficulties of environmental responsibility, and the protection of human rights are all aspects that must be considered by any thriving business. I did acknowledge this in 2009, although I anticipated the increased emphasis on these topics. The disparity between brands has become more predominant. More than 10 years ago, when the vast majority of brands first initiated their corporate responsibility programs, the differences between them were not nearly as prominent as they are today.

The challenges that currently face the industry of outdoor clothing have been presented in a comprehensive manner to the reader throughout research. This comprehensive information could be useful for communicating responsibly, managing supply chains, or designing responsible products. Additionally, students who are interested in clothing design might benefit greatly from the knowledge provided by this study about the sustainability of outdoor clothing. This research compiles a large quantity of information on the industry's pioneering businesses for the benefit of industry experts. In conclusion, this study provides academics with a variety of new research ideas and alternatives to further enhance their knowledge.

5.4 Final conclusions and suggestions for further research

The past decade has changed the discussion on responsibility and sustainability in the outdoor clothing industry. The complexity of these issues has increased, and new challenges have appeared. However, some of the core aspects have also remained the same. The triple bottom line of responsibility is environmental, social, and economic responsibility. This study concentrated on the former two. Although they are interlinked, proper environmental and social responsibility decisions impact economic responsibility.

One of the key results was that the outdoor brands discussed environmental responsibility more than social responsibility. This is also why the study was weighted toward that topic. When discussing clothing, one of the fundamental aspects is design because many environmental responsibility decisions are made in the design stage. The bottom line of outdoor clothing design is that it should function as intended. The desired design objective is that the user loves the garment and takes good care of it. One of the findings was that the brands concentrate on user-centered design. Successful emotional design makes the user care for and repair the garment, thereby extending the product's lifecycle. Companies want users to be loyal to them and thus offer repair services and, at times, lifetime warranties.

At the design stage, material choices are also made. The brands offered extensive information on materials and their benefits, as well as their disadvantages. The companies compared natural and synthetic fibers and justified why they had chosen particular fibers. The most important discussion related to natural fibers was organic alternatives and degradability. End-of-life issues also were addressed as related to the climate crisis and environmental challenges. Some topics included materials from renewable sources and avoiding the use of crude oil. Man-made fibers are ideal in functional outdoor clothing, but they cause various problems. For example, the issue of microplastics has become prominent over the past decade.

The ability to keep water out is one of the most important qualities of functional outdoor shell clothing. Fluorocarbons have proven to be the most efficient remedy for repelling water; nonetheless, they pose a threat to both human health and the environment. Consequently, a number of companies have eliminated their use of PFCs over the past decade. Functional clothing may also include additional features, such as the ability to prevent body odor, provide protection from ultraviolet rays, or repel mosquitoes. These technologies call for unqiue chemistry, sometimes even nanotechnology. However, how this technology affects people's health or the environment is still unknown. Those manufacturers whose products possessed these functions provided evidence that their product was risk-free.

End-of-life solutions are one of the most important problems to solve since single-fiber textiles are required for recycling. Therefore, the brands attempted to create apparel that was not only manufactured from recycled materials but could also be recycled after wear. Composting used clothing was another alternative to dumping it in landfills. Garment lending libraries, subscription services, and other forms of renting or reusing clothing were also becoming increasingly popular.

The production of outdoor wear frequently makes use of two key animal fibers: merino wool and down, both of which have desired properties. In the past 10 years, however, significant development has occurred in the field of animal rights, and new standards have been established. Mulesing-free wool and live-plucking- and force-feeding-free down are presumably the new industry standards. These cruel practices are now considered unethical.

Over the last decade, the focus on social responsibility has increased, and a number of the studied brands addressed this topic, providing their guiding principles. For instance, problems like forced labor and the lack of a livable wage are extremely difficult for companies to overcome on their own. Thus, the companies became members of various groups dedicated to protecting the rights of workers. The brands also conducted both independent and internal audits of the suppliers with whom they worked.

To summarize, responsibility and sustainability are enormous areas that frequently call for the engagement of a team representing the brand. The standards of ethical companies in the business are always being raised, and as a result, companies are becoming increasingly divided. Some companies strive to be at the forefront of every development, while others fall further behind. For example, in 2009, howies and Sierra Designs were forerunners, but a decade later, they have not updated their webpages regarding responsibility topics. In contrast, others have made their website like a library of sustainability.

Finally, I find the enormous collaboration that exists in the outdoor clothing sector to be both reassuring and motivating. The vast majority of the recent shifts in circumstance may be attributed to collaborative efforts.

Several avenues could be pursued in terms of further research. These issues could be looked from different stakeholders' perspectives, as follows:

- This topic could be explored in further depth through the use of qualitative interviewing of key responsibility managers in the companies.
- An understanding of the end users of these items could be developed through the use of netnographic research into the awareness, values, and consumption patterns of consumers.
- Netnographic research on consumer views and criticism on social media could be conducted.
- Auditing information pertaining to the brands, such as that obtained from the Sustainable Apparel Coalition's Higg Index, bluesign®, and several other environmental labels, as well as the Fair Wear Foundation and Fair Trade Certified, could be examined. I fully expect to see this kind of data collection implemented soon.

In conclusion, I have a positive outlook for the future despite the deep issues related to responsibility and sustainability. Through this research, I have concluded that the forerunner companies are making genuine efforts to enhance practices and operate in an ethical manner. The outdoor clothing industry is working collaboratively to find solutions to the serious problems that exist and will continue to appear in the future.

Post Scriptum

After writing this research, Patagonia published mid-September 2022 news that are exceptional in corporate world. On their web page is writing that is signed by Yvon Chouinard. The writing starts:

"Earth is now our only shareholder.
If we have any hope of a thriving planet – much less a business – it is going to take all of us doing what we can with the resources we have. This is what we can do:"

Chouinard tells that he never wanted a be a businessman and continues to tell how they sifted to environmental protection. In 2018, they change the company's purpose to: *"We are in business to save our home planet.".*

The news is that instead of selling or going public they created their own solution: "*Here's how it works: 100% of the company's voting stock transfers to the Patagonia Purpose Trust, created to protect the company's values; and 100% of the nonvoting stock had been given to the Holdfast Collective, a nonprofit dedicated to fighting the environmental crisis and defending nature. The funding will come from Patagonia: Each year, the money we make after reinvesting in the business will be distributed as a dividend to help fight the crisis."*

It is clear that this will change how we see business, and it has an effect on other outdoor brands in a long run. Chouinard finishes his text*: "Despite its immensity, the Earth's resources are not infinite, and it's clear we've exceeded its limits. But it's also resilient. We can save our planet if we commit to it."*[711] I think that I cannot find a better finish for my work. I hope that this research encourages to think of creative and innovative solutions for the planet and people. Environmental and social responsibility should be interlinked in everything we do.

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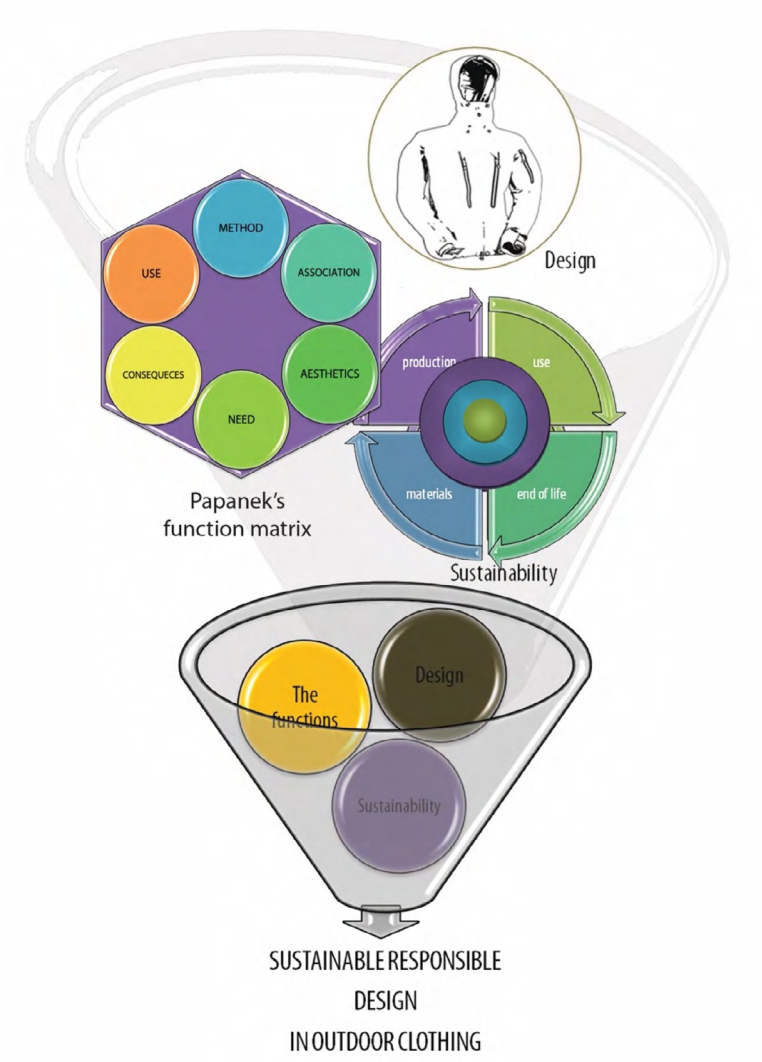
Appendix 1.

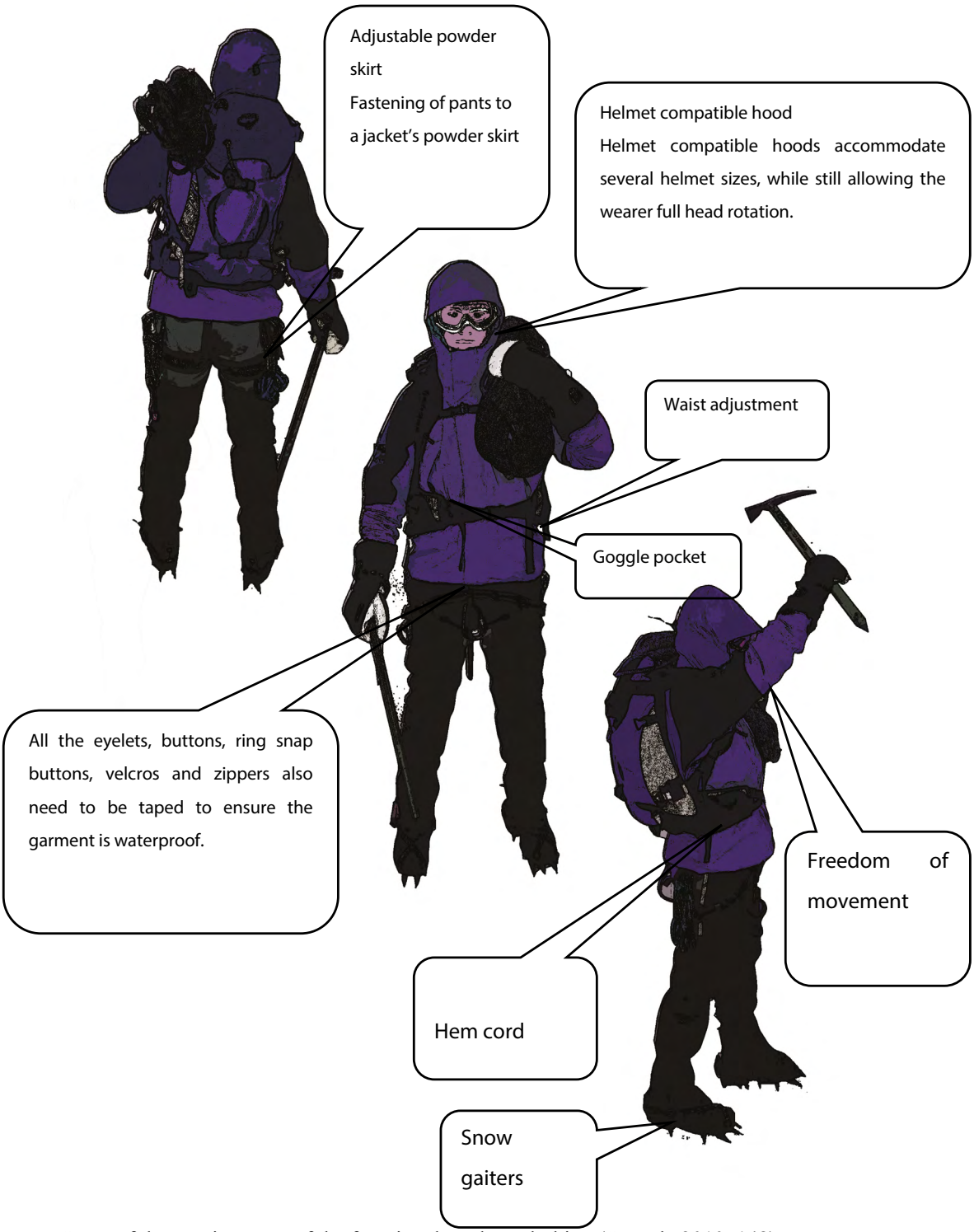
The model for sustainable responsible outdoor clothing design was published in 2010 after initial part of this research. The model was starting point and guided the latter part of this research.



The model combines design, functions and sustainability in outdoor clothing to tool for designer to be able to design sustainable responsible outdoor apparel (Seppälä 2010, 146).

DESIGN

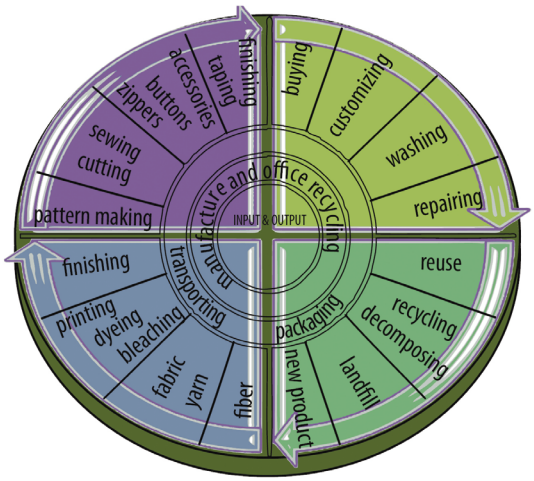
The modern functional outdoor clothing concept is based on a layering system. Each layer has a specific function and they are designed to work together to offer overall comfort and protection. Good design, quality materials and the possibility to repair outdoor clothing will increase the life cycle of outdoor apparel (Seppälä 2010, 147).



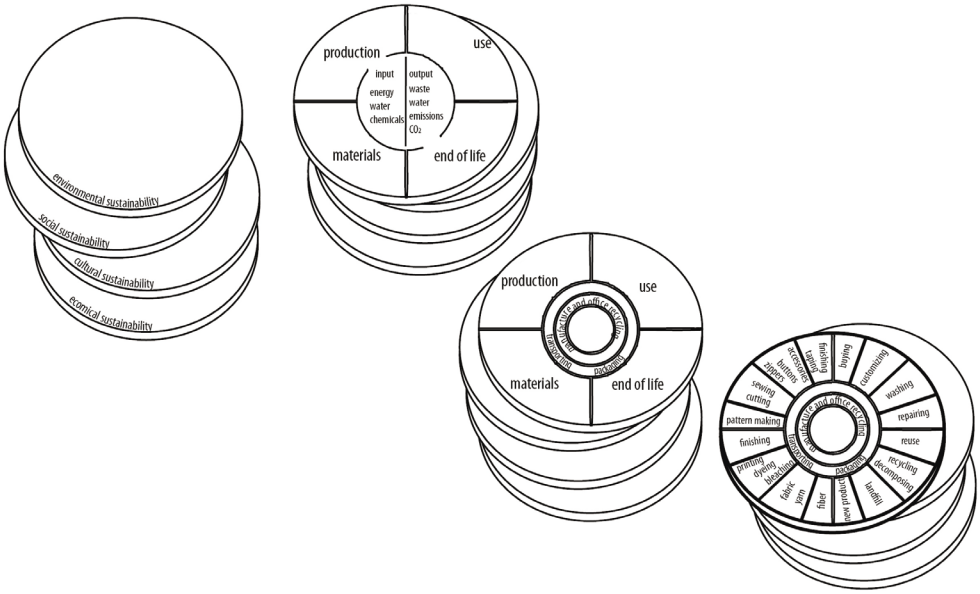
Some of the requirements of the functional outdoor clothing (Seppälä 2010, 148).

PAPANEK'S SIX-SIDED FUNCTION MATRIX

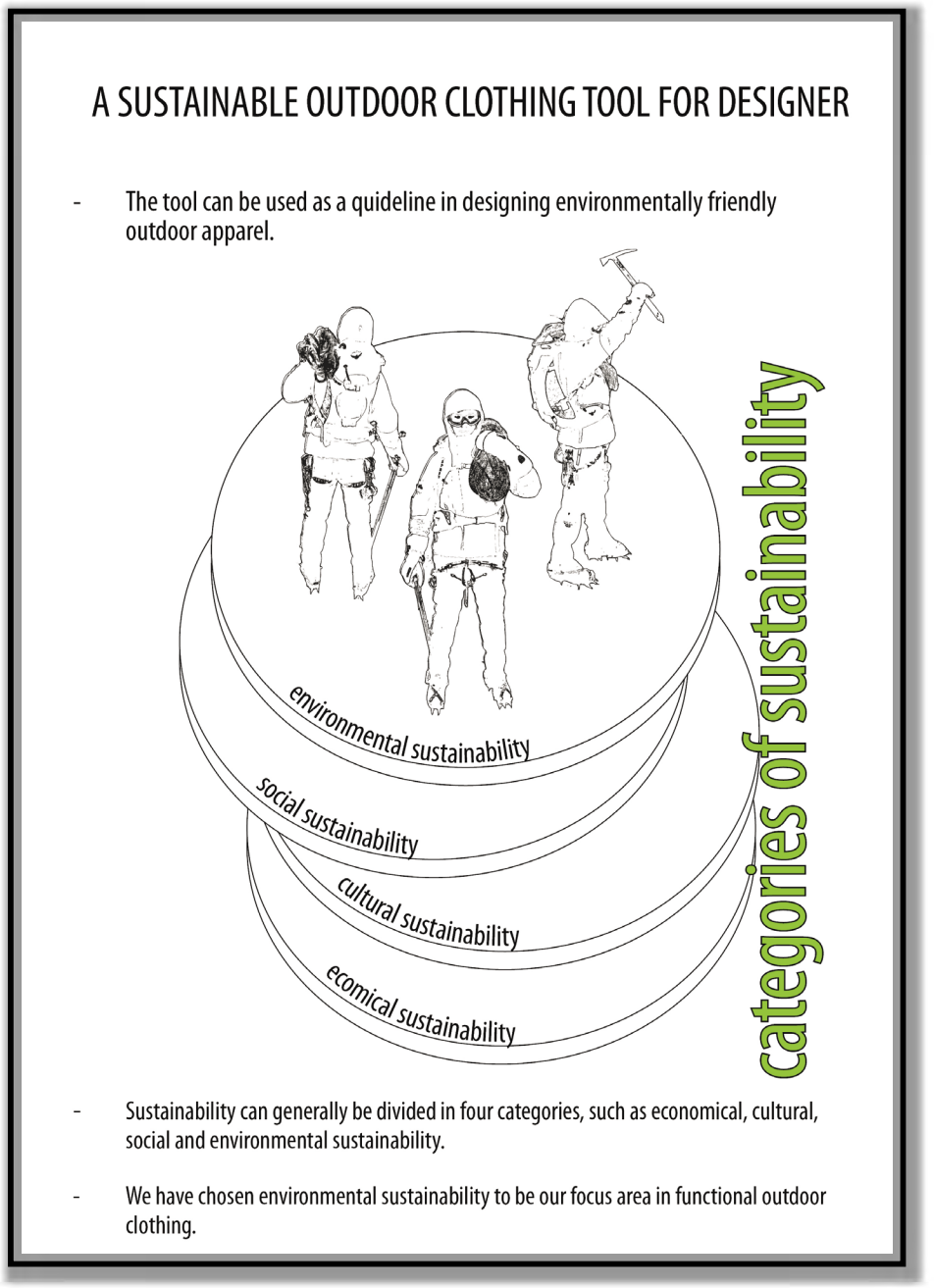
Papanek's six-sided function matrix was first introduced in 1970 (Seppälä 2010, 149).



SUSTAINABILITY IN CLOTHING LIFE CYCLE

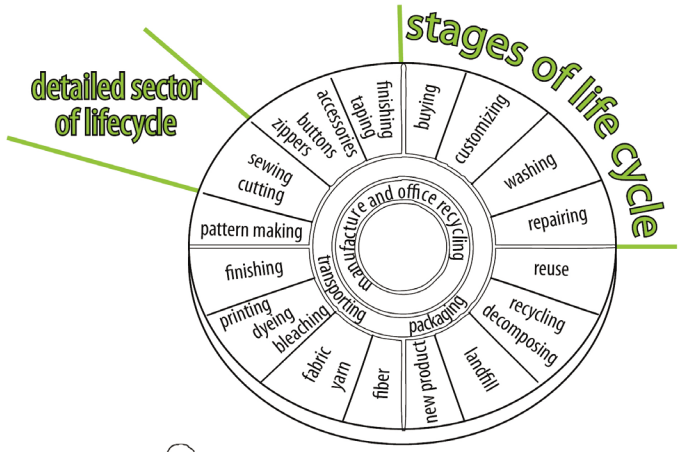


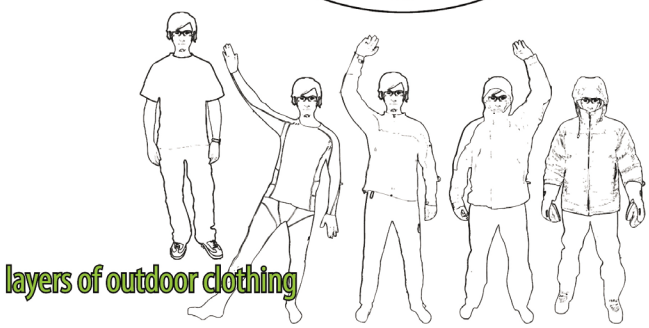
Materials and processes used for outdoor clothing have several potential environmental risks. When surveying environmental impacts of clothing, impacts can be divided into four main groups: manufacturing, delivery, consuming and end of life (Seppälä 2010, 150).



The four categories of sustainability are environmental, social, cultural and economical sustainability. The environmental sustainability is above others, because without it others cannot exist (Seppälä 2010, 151).

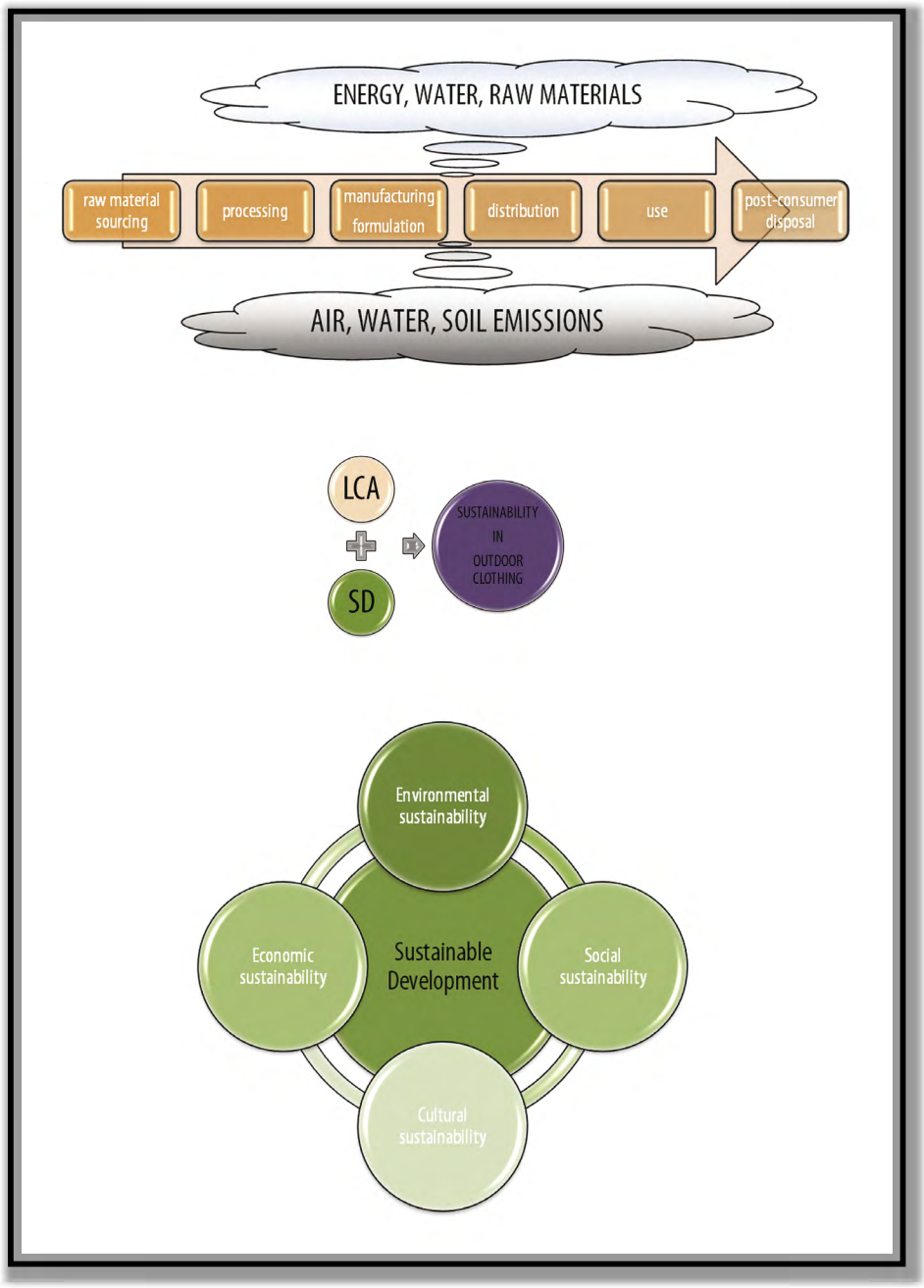
- The environmental sustainability is divided by us end of life stages, which have an effect on environmental friendliness of outdoor clothing.
- The four main stages are material, production, use and end of life. These stages are divided more detailed sectors. The footprint of all of these sectors should be taken in consideration when evaluating overall impact of outdoor clothing.
- In all of these stages happens packaging, transporting and manufacture and office waste management.
- These detailed sectors can be used also when evaluating other categories of sustainability.



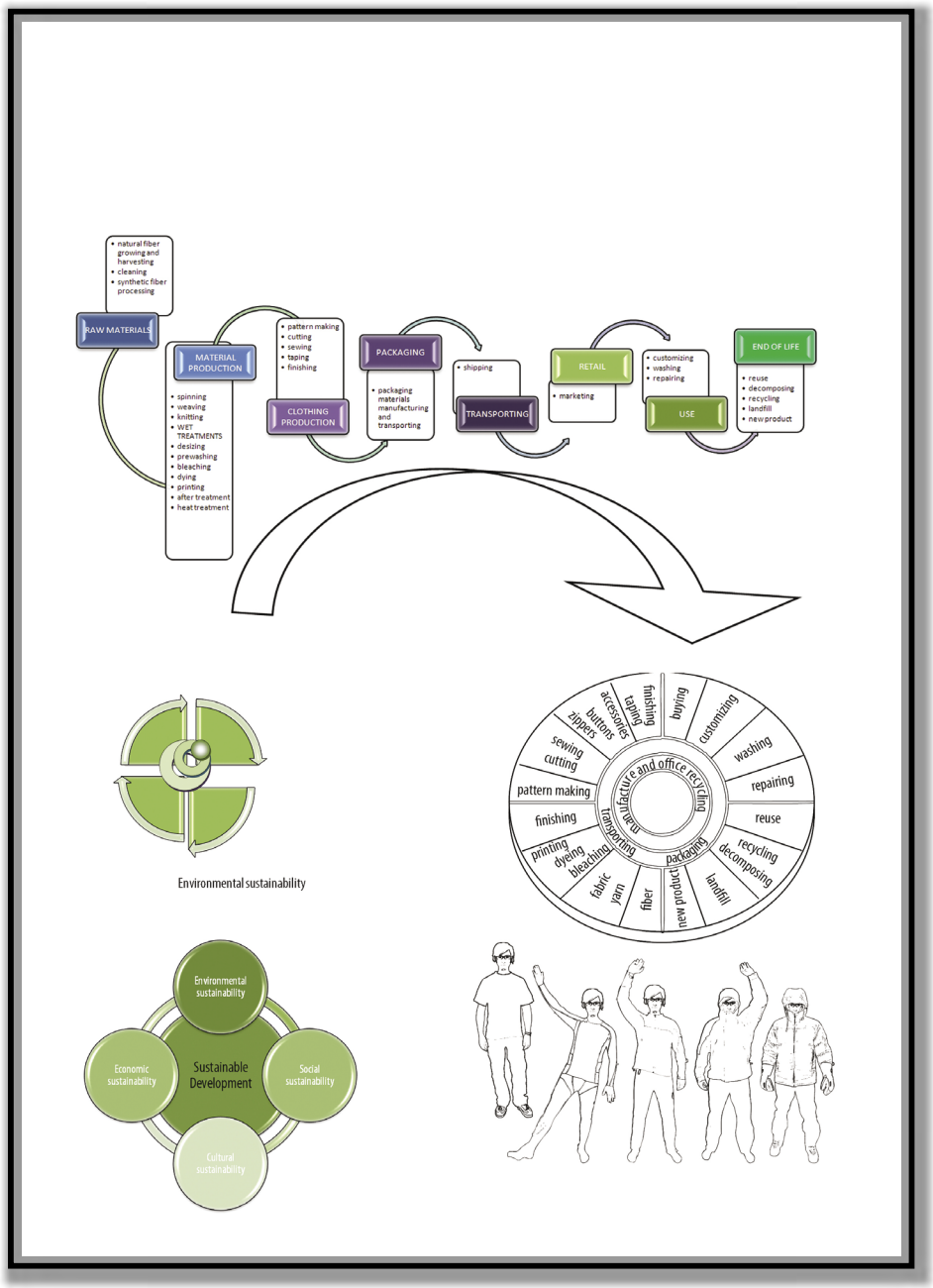


- All layers of functional outdoor clothing can be evaluated with this tool.

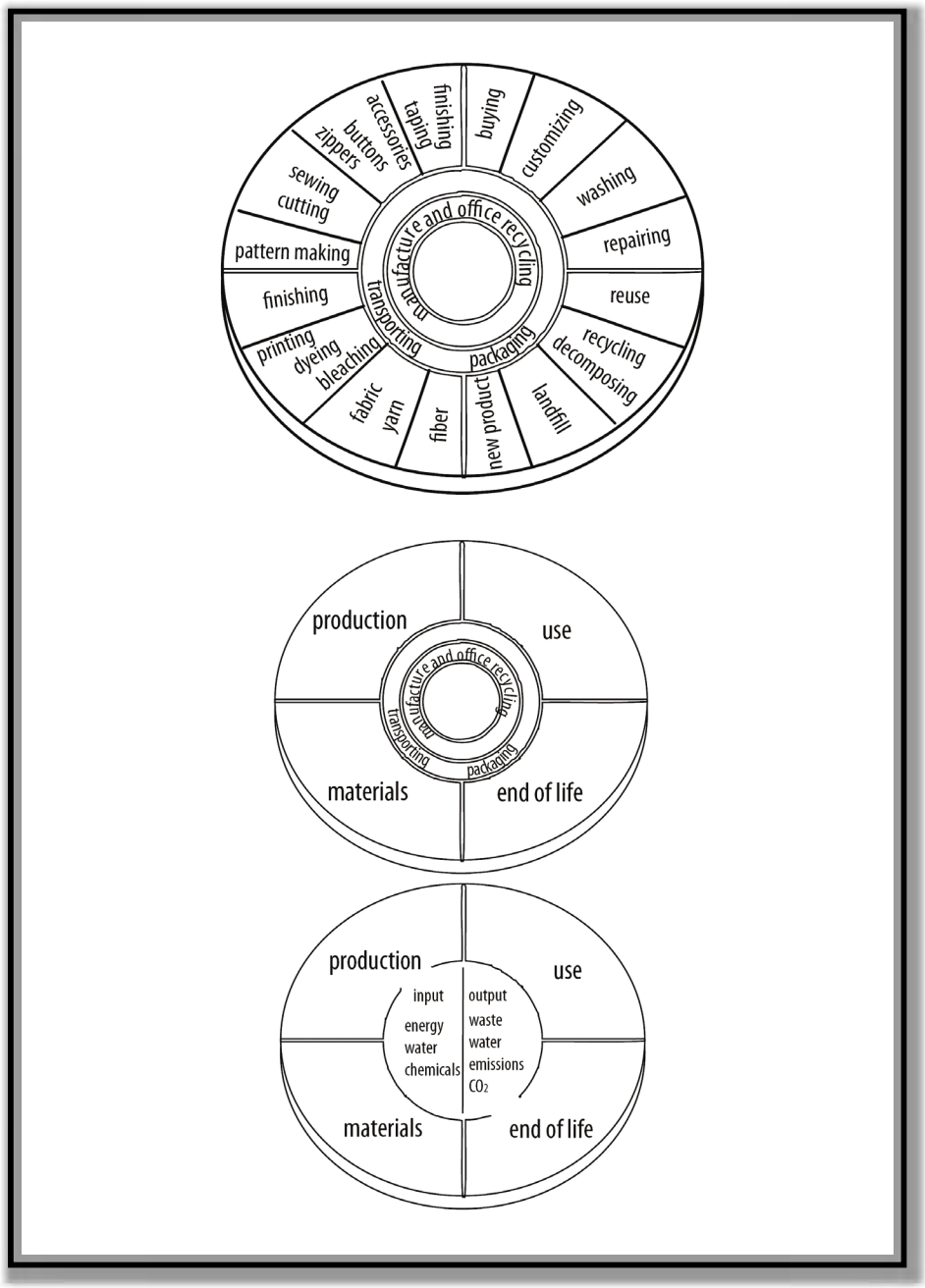
Seppälä & Söder model of sustainability in outdoor clothing (Seppälä 2010, 152).



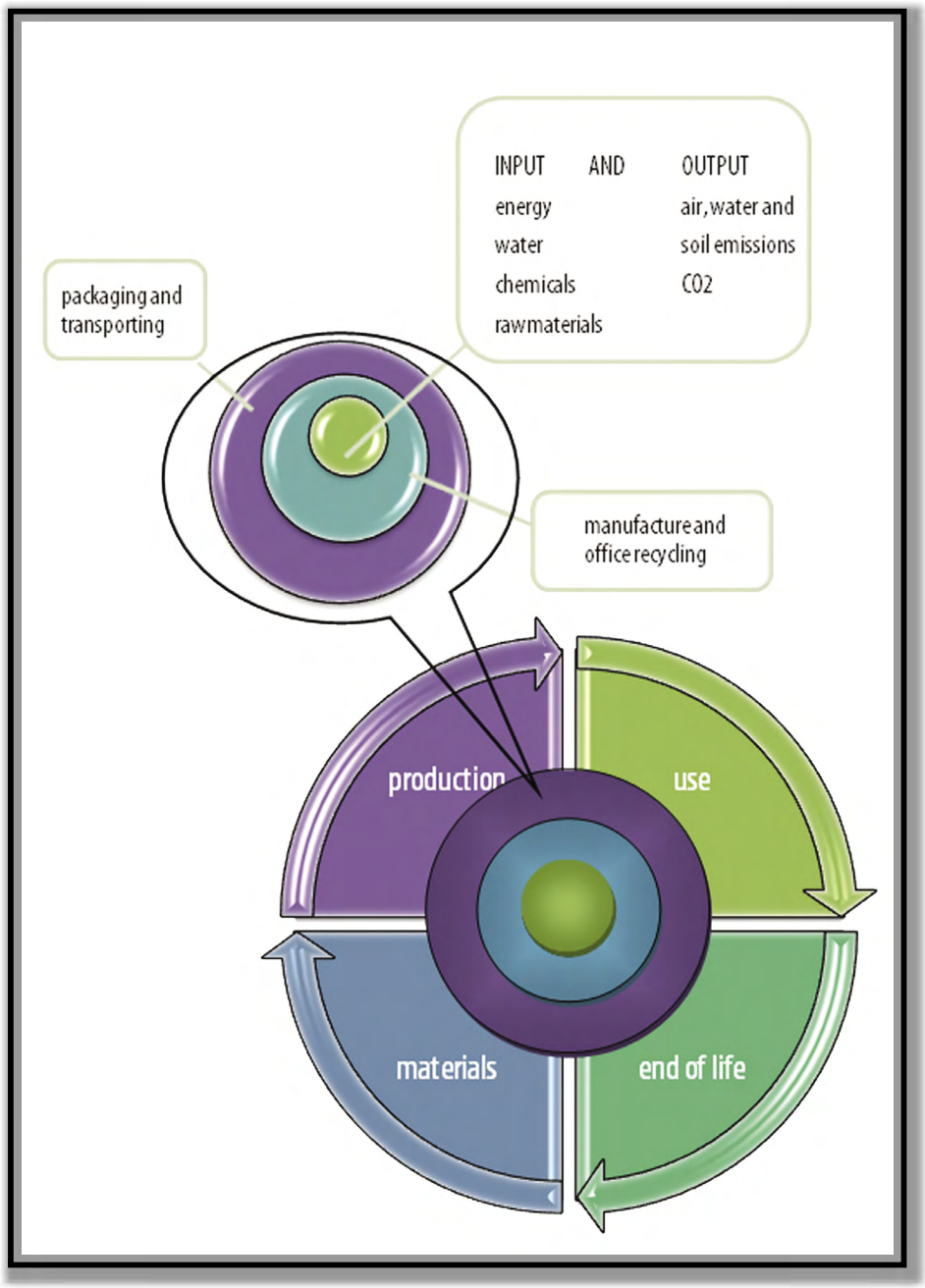
The tool for designing sustainable responsible outdoor clothing is combined from ideas of life cycle analyses and sustainable development (Seppälä 2010, 153).



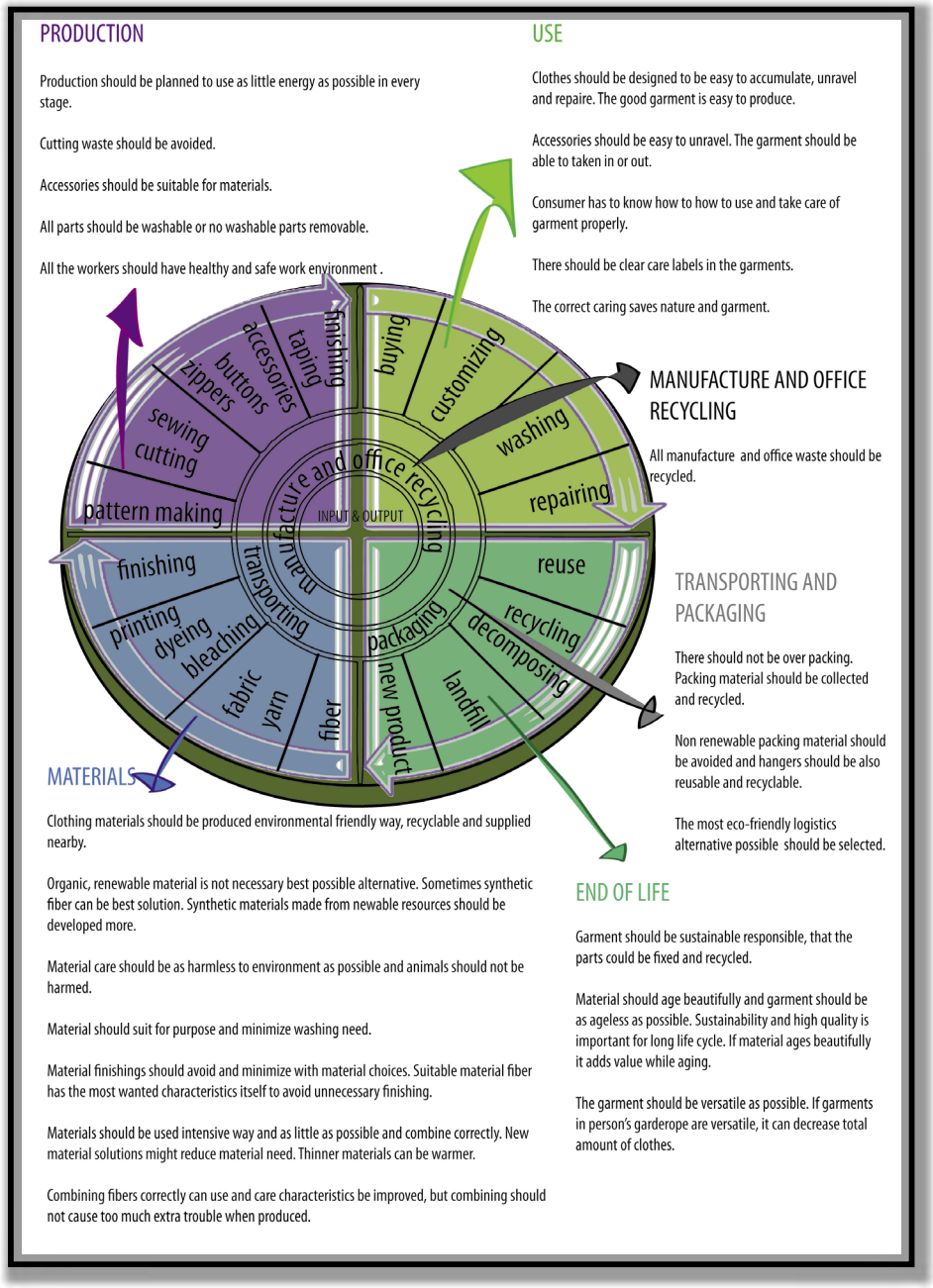
The model combines four aspects of sustainable development with the life cycle of all the layers of outdoor clothing. (Seppälä 2010, 154).



Designers should consider all sections of the model when designing sustainable responsible outdoor clothing. (Seppälä 2010, 155).



A detailed picture of environmental sustainability. Inputs and outputs of whole life cycle of outdoor clothing are in the middle. In our life cycle model packaging and transporting are in the circle, because they happen in all the stages of the life cycle (Seppälä 2010, 156).



Some of the things every outdoor clothing designer should consider (Seppälä 2010, 157).

Appendix 2.


ARC'TERYX
› MEN'S
› WOMEN'S
DESIGN
MATERIALS
CONSTRUCTION
ARC'TERYX
DESIGN
Environmental Statement
Arc'teryx strives to continually become more aware of the impact of our business practices.
Manufacturing Statement
Find out more about how we manufacture our products.
MATERIALS
Our Take On Environmental Stewardship
Our Design Philosophy and the
Choices

Appendix 3.


Columbia Sportswear Company
Industry Collaboration
CORPORATE RESPONSIBILITY
INSIDE OUT
OUR PASSIONS, PRODUCTS & PEOPLE
Monitoring and Training
At Columbia Sportswear, we are committed to building a company of which we can all be proud – not only of the innovative products we create and the financial results we achieve, but the manner in which we achieve them.
Standards of Manufacturing Practices (SMP)
HERPROJECT (HEALTH ENABLES
project HER
If you could triple your investment and help people at the same time, would you do it?
Social Responsibility
DID YOU ORDER THAT IN A REUSED BOX?
PRODUCT OF AN OVERLY PROTECTIVE MOTHER
Columbia Sportswear Company

Appendix 4.


FJÄLL RÄVEN
Find retailer
Catalogue
Contact
Choose language
Search
Products
Activities
Materials
Fjällräven Classic
Welcome.
To a world of functional equipment for more - and more comfortable - journeys in the outdoors.
Fjällräven
History
Quality Time
Quality Time home
Code of Conduct
Product policy
Environmental policy
Animal policy
Quality time is a long time!
NYHET
FJÄLL RÄVEN
1984/85
Environmental Policy
Nature is where Quality Time is found!
We believe that nature is fantastic and we hope to inspire more people to get out there. The reason is simple, this is where we like to spend our spare time and we are also among a small group of lucky people who also spend much of our working hours there. That is why we are doing our best to integrate environmental care in every aspect of our business. This includes developing durable materials, but also choosing materials that have less of an impact on the environment, such as eco-cotton or bamboo.
Materials & Function
Animal Policy
Quality time goes for Animals too

Appendix 5.


▪ Haglöfs environmental program has three focus areas: Materials, transports and packaging.
HAGLÖFS
OUTSTANDING
OUTDOOR EQUIPMENT
Haglöfs business is closely linked to the environment. Our commitment to protecting it is deep and genuine. Our environmental work is purposeful, with concrete and strong actions, both immediate and long-term.
"WE ARE RUNNING OUT OF PLANET"
HAGLÖFS' AND SUSTAINABILITY
Nobody today can ignore the threats to the environment. Nobody can turn a blind eye to the consequences of climate change and pollution that we are seeing around us, or those predicted by scientists and experts.
The examples are many and thought-provoking. The percentage of carbon dioxide in the air is the highest in 250,000 years. Over the past fifty years, biological diversity has decreased more than ever before. Borneo's orangutans are threatened with extinction and between 50 to 100% of the world's existing polar bears risk to become extinct in 100 years.
Glaciers are shrinking. One of the largest is in the Himalayas and it is estimated that two-thirds of it will have melted by the year 2050. Hence, 300 million Chinese will be unable to irrigate their fields.
Rivers in Africa are drying up. A billion people in the, world today live with a constant shortage of clean water. Ground acidification and nitrogen fallout lead to forest decline in Europe. Chemical pollutants are spreading worldwide.
No corner of our planet is unaffected. Among the Inuit in Greenland they have measured one of the highest contents of harmful substances from electronic waste in the world.
Haglöfs business is closely linked to the environment. Our commitment to protecting it is deep and genuine. Our environmental work is purposeful, with concrete and strong actions, both immediate and long-term.
▪ Haglöfs environmental program has three focus areas: Materials, transports and packaging.
suppliers who have their own environmental policy.
▪ We analyse all discharges generated by our operations, including transport of personnel and material. The aim is to reduce carbon dioxide emissions, and we are drafting a list of concrete actions with measurable goals.
▪ Haglöfs has begun a gradual transition to using only recycled materials in packaging and hang tags.
▪ The offices in Kalhäll and Avesta recycle all office waste. Similar processes are being introduced at the other Haglöfs offices around the world.
▪ Haglöfs long-term product development objective is to use material with naturally integrated
properties.
▪ We are increasing the use of recycled, environmentally- friendly materials in our products. Next year, several Haglöfs products will be made from 100% recycled material.
▪ Through Haglöfs membership in EOO (Association for Conservation), the
the world's natural resources via sponsorship of concrete, local projects.
Director of Sustainability at Haglöfs is:
Lennart Svensson
IT IS TIME FOR ACTION

Appendix 6.


HOUDINI
Svenska | English
Home
Products
Enivronmental commitment
We have committed ourselves to minimize environmental impact and evolve into a sustainable business.
Transitions to sustainable alternatives in materia
trans-ports are being made as soon as they are
Sections
Houdini magic
Products
Friends
Core Comfort
Environment
Read more about Core Comfort
Environment
Houdini - not just saving your butt - saving the world.

Appendix 7.


howies®
login
view basket
search
Every product we make has passed the 'rocking chair test'. This is something we use to guide us along the path we are taking. So when we are old and grey and sitting in out rocking chairs, we can look back on the company we created with a smile. That's why we go to the trouble of using the best quality materials to make sure our clothing lasts longer. The longer our products last the less impact they will have on the environment, and the bigger our smile will be.
To go find your cause to fight for, your company to go start, your invention to invent, your book to write, your mountain to climb.
DO
lectures
About Do.
Do something
Do blog
about Do
speakers
buy tickets
subscribe
Do-nate
We're on Twitter
The idea is a simple one.
us to go and Do things too.
They can be small Do's or big Do's or just plain amazing
just waiting, and waiting for you to follow your heart.
To go find your cause to fight for, your company to go start, your invention to invent, your book to write, your mountain to climb.
amazing things.
They are fire-starters.
David Hieatt - Co-founder of the Do lectures
The one thing the Doers of the world Do, apart from Do amazing things, is to inspire the rest of us to go and Do amazing things.
They are fire-starters.
Where will I stay?
forest is unlike any other campsite. The accommodation is

Appendix 8.


MILLET
RECYCLE & SAVE
MILLET
MOUNTAIN
ENVIRONMENTAL
CONTRIBUTION
① CLIMB
MILLET ENVIRONEMENTAL CONTRIBUTION
② COLLECT
③ CONVERT
④ RECYCLE INTO PRODUCTS USED BY MILLET
RECYCLE & SAVE

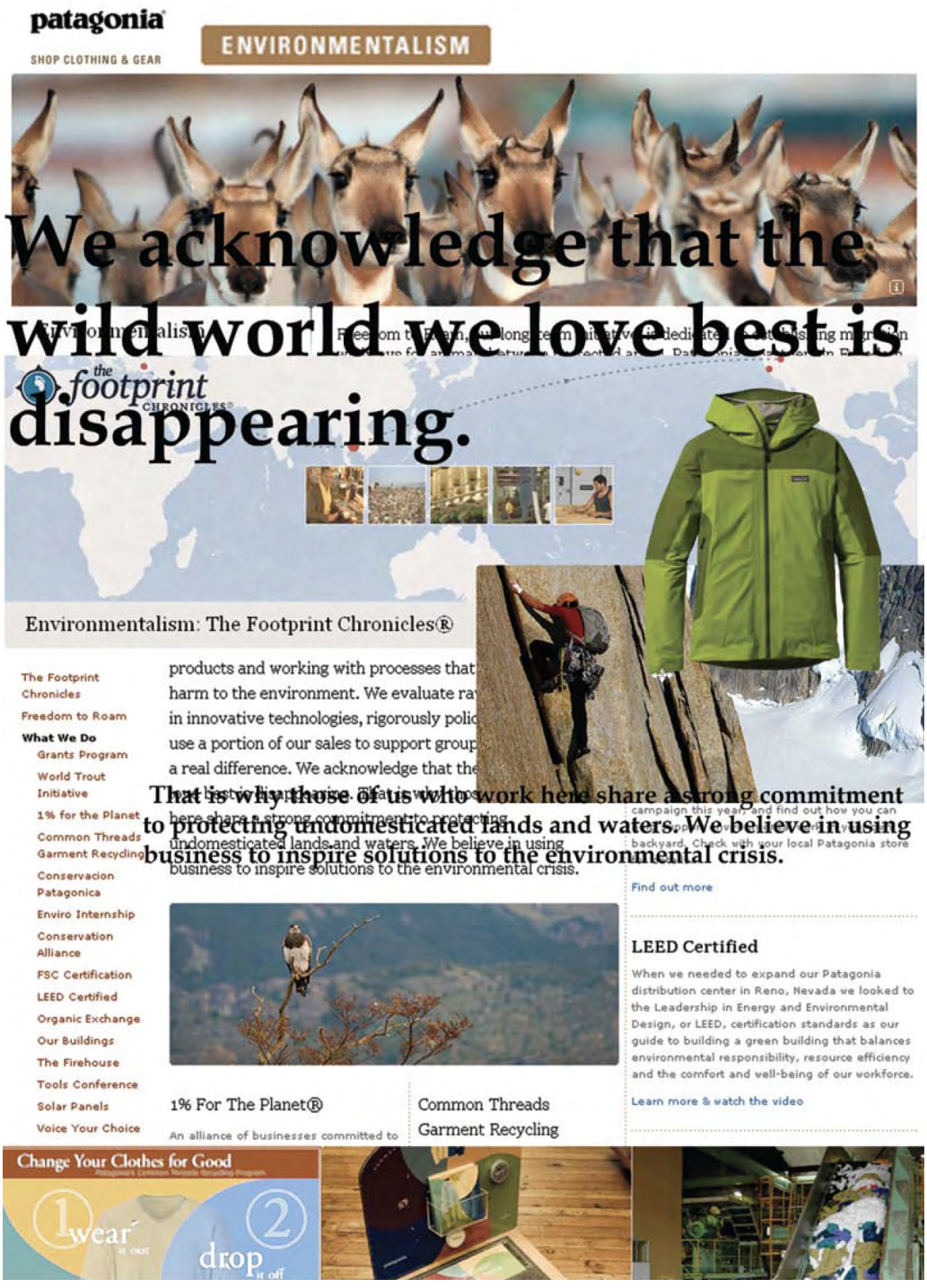
Appendix 9.


Jack Wolfskin
PROJECT REBOUND | DONATIONS
Whatever latitude I'm walking at and whatever I experience there, it
same conclusion in the end: the knowledge of the incredible variety
us that needs to be protected. Each day outdoors makes me realise t
out to preserve this nature. This affects all of us and happens every
Jack Wolfskin we will bend over backwards to ensure that our produ
pleasant and attractive as possible and to keep making the odd drea
WHAT'S THE PROJECT REBOUND?
PROJECT DEVELOPMENT
IMAGES & FILMS
PROJECT REBOUND
THE PROJECT
ONE YEAR "PROJECT REBOUND"
On 4 July 20[illegible], the third interna-
tional youth camp run by the
"Ice-Climate-Education"
project in Húsavík in Iceland
came to an end.
On the other hand, our re-
spect goes to the unbeliev-
able beauty and variety of
nature.Nationally and inter-
nationally valid environ-
mental regulations must be
observed and it is necessary
to minimise potentially neg-
ative influences. For this
reason, we contractually ob-
ligate our business associ-
ates to recognise and impl
ment the standards we have
set. Only in this way can
there be trust-based coop-
eration which not only satis-
fies our demands but also
the expectations of our cus-
tomers in purchasing a Jack
Wolfskin product.
ENGAGEMENTS
ECOLOGICAL
ENGAGEMENT
» MORE
SOCIAL
ENGAGEMENT
» MORE
trekking:

Appendix 10.


Find a Store
Sustainability
“Never stop dreaming and attempting what is considered Impossible...”
Our Sustainability Journey
Sustainability and conservation form the core of The North Face pledge to advance the well-being of the planet, its citizens, and those who enjoy exploring it.
May 2008
As we continue to develop authentic and technically innovative products for the outdoor athlete, The North Face will also aggressively and responsibly continue to integrate environmental, economic, philanthropic, and social initiatives into our business practices.
The North Face embraces this responsibility and opportunity to contribute as an industry leader to solutions and creation of best practic
Sustainability
Sustainability and conservation form the core of The North Face pledge to advance the well-being of the planet and its citizens - especially those who enjoy exploring our world.'

Appendix 11.


patagonia
SHOP CLOTHING & GEAR
ENVIRONMENTALISM
We acknowledge that the wild world we love best is disappearing.
the footprint CHRONICLES
Environmentalism: The Footprint Chronicles®
The Footprint Chronicles
Freedom to Roam
What We Do
Grants Program
World Trout Initiative
1% for the Planet
Common Threads Garment Recycling
Conservacion Patagonica
Enviro Internship
Conservation Alliance
FSC Certification
LEED Certified
Organic Exchange
Our Buildings
The Firehouse
Tools Conference
Solar Panels
Voice Your Choice
That is why those of us who work here share a strong commitment to protecting undomesticated lands and waters. We believe in using business to inspire solutions to the environmental crisis.
Find out more
LEED Certified
When we needed to expand our Patagonia distribution center in Reno, Nevada we looked to the Leadership in Energy and Environmental Design, or LEED, certification standards as our guide to building a green building that balances environmental responsibility, resource efficiency and the comfort and well-being of our workforce.
Learn more & watch the video
1% For The Planet®
An alliance of businesses committed to
Common Threads Garment Recycling
Change Your Clothes for Good
1 wear it out
2 drop it off

Appendix 12.


PeakPerformance
COLLECTION INSPIRATION FRIENDS MEDIA EVENTS JOURNAL CAMP NEWS STORES JOIN US
OUR VALUES, VISION AND MISSION
our Values
Every single activity – whether on a grand scale or as
* For real
* Long lasting
* We believe in and trust people
* Team Peak Performance
* Building for the future
* Renewal
ENVIRONMENT, ETHICS AND CSR
There is an old Peak Performance motto that reads, "Man and nature in perfect harmony". And although this may be an unachievable goal, it does say something about our ambitions and our relationship with our delicate environment.
In concrete terms, what we do here at Peak Performance to minimize our environmental impact as much as possible is documented in an extensive environmental program that covers everything from materials requirements and packaging to transport and proactively eco-friendly measures. Fundamentally, our vision is otherwise to work with long-term quality - products that last, both physically and
Harmony is another key word when it comes to the people in Peak Performance's world. And by that, we mean colleagues, customers, retailers, suppliers and everyone else with whom we deal. We want everyone who comes into contact with us - whether on a large scale or a small one - to feel that it is a meeting of equals, that we show them the respect we would like to receive in return. Our Corporate Social Responsibility program and our Code of Conduct are also carefully documented, in cooperation with our owners, IC Companys.
Read more at IC Companys
Our Vision
Our Mission
"To develop, manufacture and sell products that are world class in terms of quality, function and design under the Peak Performance brand name, based on
contradict

Appendix 13.


SIERRA DESIGNS
THE SCIENCE OF MEASURING AND REDUCING OUR ENVIRONMENTAL FOOTPRINT
SEEK ADVENTURE
SIERRA DESIGNS OFFSETS 100% OF OUR ENERGY USAGE. Click here to calculate your carbon footprint.
SIERRA DESIGNS
TO US, IT'S ABOUT LIVING AND WORKING IN WAYS THAT DON'T JEOPARDIZE THE FUTURE OF OUR SOCIAL, ECONOMIC AND NATURAL RESOURCES.
THE SCIENCE OF MEASURING AND REDUCING OUR ENVIRONMENTAL FOOTPRINT
THE SIERRA DESIGNS GREEN EFFECT MISSION IS TO PRACTICE AND PROMOTE A HARMONIOUS RELATIONSHIP BETWEEN OUR BUSINESS WORLD AND THE OUTDOOR WORLD.
MEN'S APPAREL // SEE ALL
WOMEN'S
SLEEPING
SIERRA DESIGNS
GREEN EFFECT