Interreg North-West Europe
Co-funded by the European Union
ECHT

ECHT INTERIM REPORT #2
SCENARIO PROCESS PART 2

REV 20240606_1

1. Background

The Green Deal transition towards a climate-neutral, resource-preserving and non-toxic Circular Economy (CE) creates new challenges for businesses. The EU Textiles Strategy aims to tackle the high waste generation and the low recycling rates and negative environmental and social impacts throughout the whole life-cycle. Textile apparel will become one of the first product group subjected to Sustainable Product Policies (Ecodesign incl. Digital Product Passport). These policies imply value chain actors having access to detailed product information incl. material compositions: Trustworthy traceability of chemicals along supply chains is one central enabler for a non-toxic, resource-efficient and climate neutral Circular Economy. Knowledge of material composition allows (eco-)design, informed procurement and purchasing decisions, improved recycling processes, thus minimise risks for health and environment from chemicals during the use phase and after the end of life. Volatility, complexity and supply chain structures, however, make it difficult for companies to work together and trace the chemicals in their products.

ECHT aims to help the industry establish chemicals traceability for a circular economy by enabling the digital product passport.

ECHT develops and implements the first traceability strategy with 3 action plans for actors of textile (1) apparel and (2) flooring value chains as well as for (3) policymakers at different levels. The action plans will draw from the learnings of innovative training schemes (capacity building). Results from the trainings and the insights gained in developing, testing and disseminating practical solutions are upscaled into a Knowledge Platform to support SME´s of the textile and other sectors "beyond pure compliance" towards innovative business models.

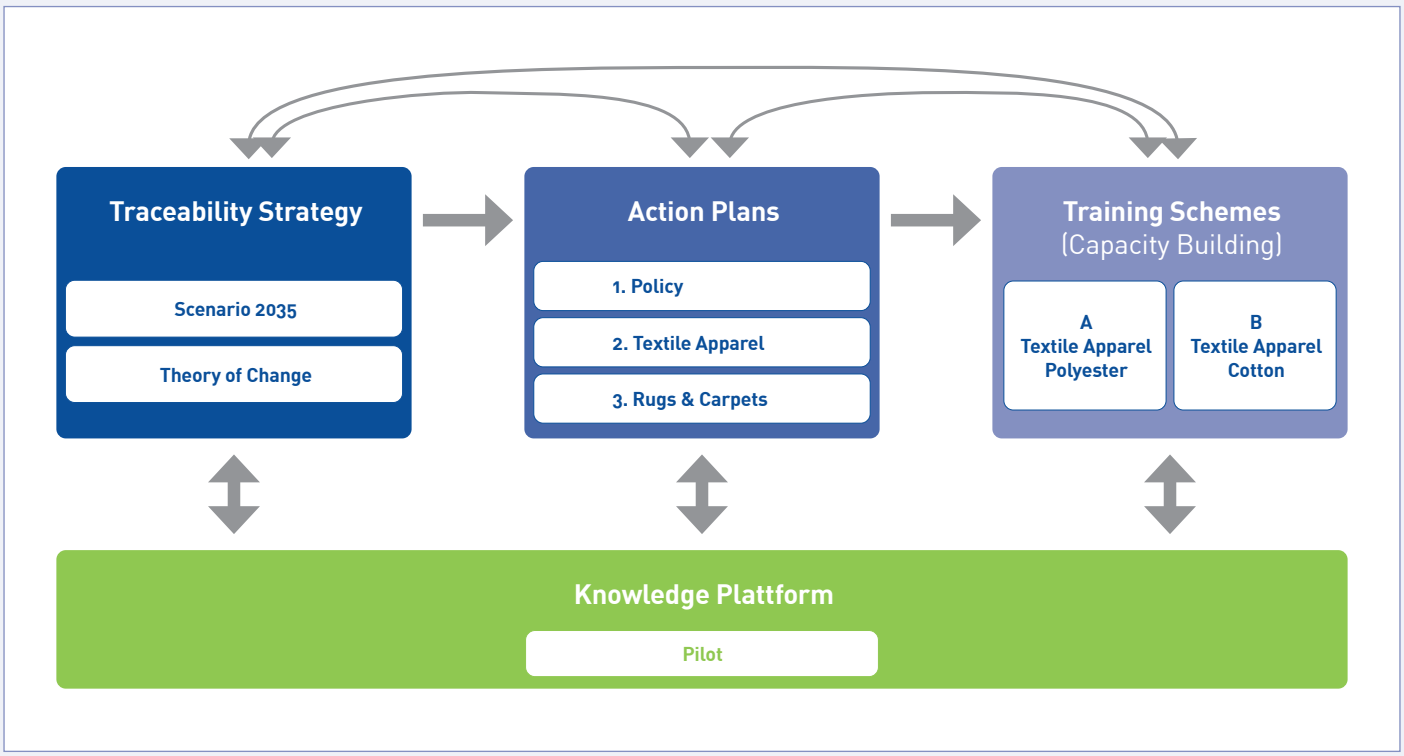

Fig. 1) Overall concept of the project ECHT

2. Scenario technique by Geschka as an instrument to develop the traceability strategy

To develop a traceability strategy, a clear vision on the ideal future state and the corresponding influencing factors as well as future projections are necessary. The apparel ecosystem shows a great variety of components, hampering a clear understanding what influencing factors create impact, form short-term to long-term, and which actors along the value chains need to provide which behavioural (change) contributions in this respect. However, a future picture of the influencing factors must be coherent and free of contradictions. For this reason, the ECHT project uses Geschka's "scenario technique" as a methodological basis. The aim of the scenario process is to find a common understanding of the challenges and to develop solution strategies and concrete action steps.

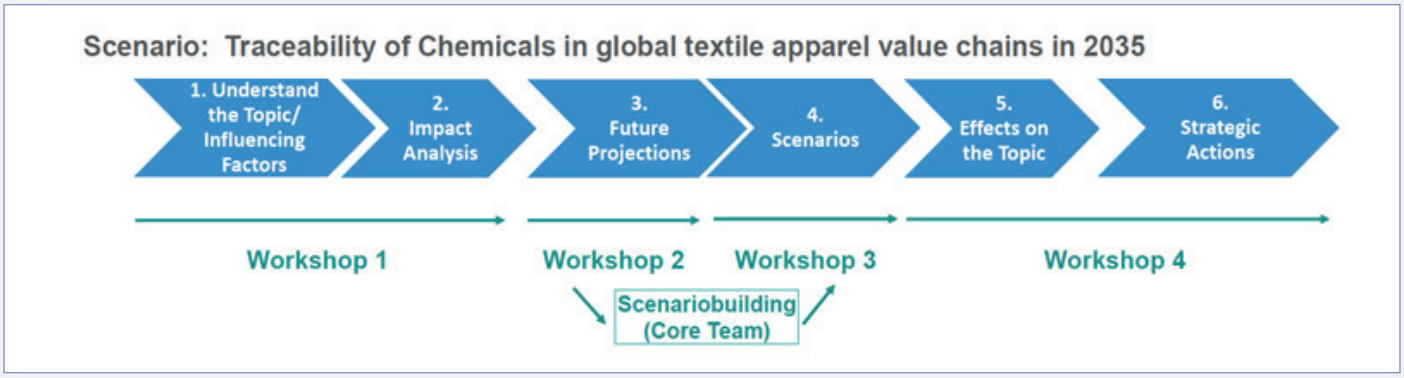

Fig. 2) Process for strategy development in the project ECHT

The starting point is the joint definition of a topic and the associated development of a common understanding of the problem. To this end, Darmstadt University of Applied Sciences organised a kick-off workshop in which interested participants from the apparel supply chain and related areas first defined the thematic and temporal boundaries of the system and analysed influencing factors with regard to the traceability of chemicals in apparel. In a second (online) workshop, the influencing factors were analysed and put in relation to see how they affect one another. These factors formed the basis to create future projections for 2035 on how the factors might develop. The insights gained from the projections are another building block in the scenario process to develop future scenarios.

THIS DOCUMENT DESCRIBES THE PROCEEDINGS AND RESULTS OF THE SECOND WORKSHOP AND THE SCENARIO PROCESS PART II

3. Proceedings and results of the second workshop

Workshop Specific

Date:	24.05.2024
Time:	10:00 – 15:00 h
Location:	Online
Organiser:	Darmstadt University of Applied Sciences

19 representatives of the textile value chains and related stakeholders from 16 organisations and 5 countries as well as 5 members of the university team took part in this online workshop. After a brief welcome by Jonas Rehn-Groenendijk in which participants had the chance to familiarise themselves with the other participants as well as the online tools (MS Teams, Miro), Martina Schwarz-Geschka started with presenting the project status including the results of the merged Impact Matrix with the final 16 influencing factors.

3.1. Influencing factors

After the last onsite workshop in May, participants were asked to fill out the rest of the Impact Matrix weighing the impact of the different factors on each other. After all individual matrices (14 matrices were submitted) of the project partners (one matrix per partner) were recieved, the university team together with Martina Schwarz-Geschka merged all individual results into a joint document. In this case, the median was used to agree on one value, as it is the middle value in a set of data (after organizing the values from smallest to largest). In comparison to the mean (average), the median is often favoured as it is more representative of the actual distribution and closer to an agreement that would have happened when discussing in person.

The analysis of the factors using the Impact Matrix helped to evaluate the influencing factors with regard to their effect on each other and therefore delivered a deeper understanding about the environmental system. The factors are categorised in driving (quotient >=1), driven (quotient <=1) and balanced factors; it should be noted however that a low influence does not equal a low importance and vice versa.

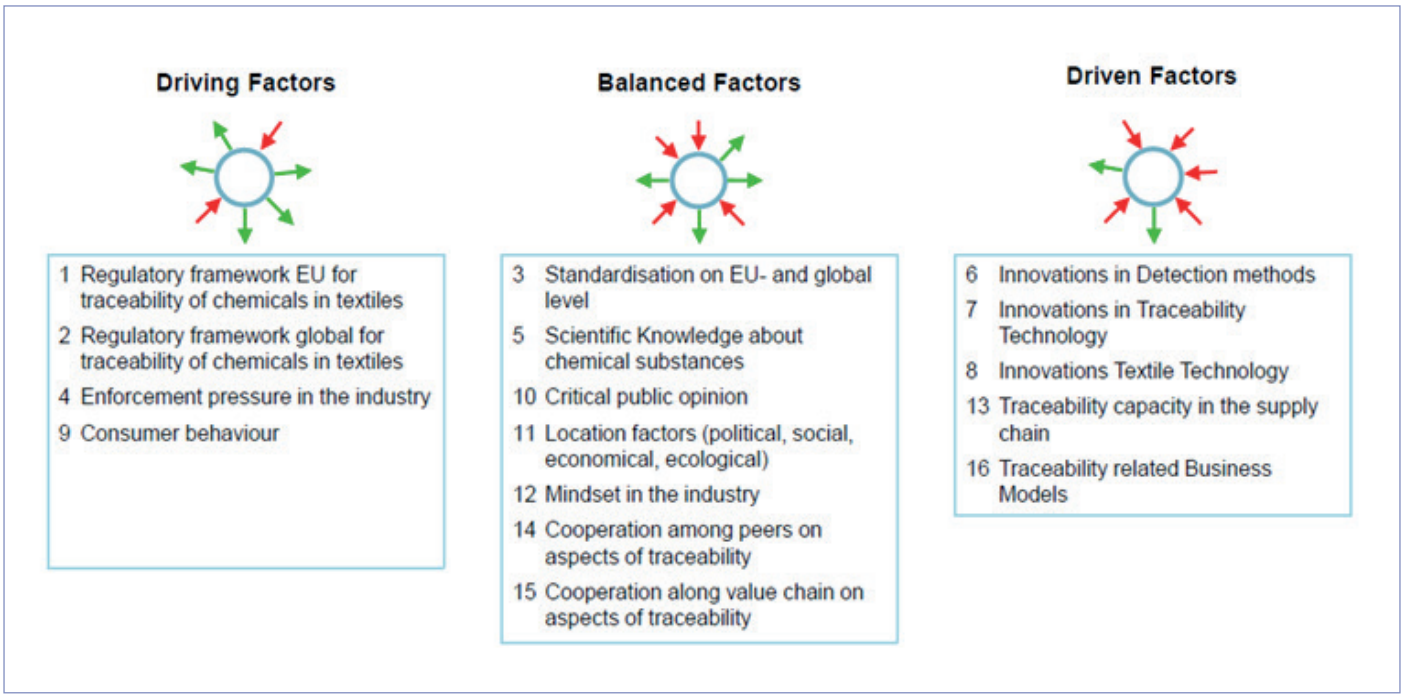

Fig. 3) Results of Impact Matrix

3.2. Future projections for 2035

Martina Schwarz-Geschka and Jonas Rehn-Groenendijk then continued to explain the underlying theory and the next steps for the development of the future projections, which are the foundation for the following scenario stories. The future projections aim to give an idea how the different influencing factors could develop in the future. However, the goal is not to prepare best and worst case scenarios, but rather different alternatives. For this purpose, the university team divided the participants into smaller groups and assigned them to four breakout rooms - accompanied by a facilitator to moderate the discussion and document the results. Furthermore, the groups were previously organised to make sure that all groups included the different perspectives present in the overall project team (e.g. industry, policymaking, etc.).

Over the coming hours, the groups then discussed and developed one or two (in some cases even three) alternating future projections for 2035 for each of the 16 influencing factors. After each break, the teams were shuffled and a different creative technique was used for the development process to stimulate their imagination (e.g. Newspaper headline, brain writing, Lotus method, etc.).

The results were captured on a shared Miro board in a pre-defined format including aspects like the status quo, a description of the projection (up to three alternatives were possible) and a justification for each of the projections.

Finally, the groups classified each projection with a likelihood (in percentage). The teams spent around 30 to 40 minutes on the development of the different projections.

In the next step and as a preparation for the upcoming workshop, the university team together with Martina Schwarz-Geschka will enter all projections in the "INKA 4.0" software and check for consistency in order to describe what environment scenarios are conceivable for the future.

▶ List of all projections see Appendix 1 (p. 5)

4. Timeline and future steps

To complete the scenario process, the university team will conduct a final workshop on site in June, which will be followed by a fourth workshop (September) that aims to develop a specific strategy (Theory of Change) that shall guide the way towards the scenario. In parallel, a number of other processes will take place in line with the overall project plan.

20.06.2024
9:30 - 16:30 h

FRANKFURT

- Scenario Workshop #3

03.09.2024
9:30 - 16:30 h

FRANKFURT

- Strategy Development (Theory of Change)

5. Tasks & assignments

We kindly ask the entire consortium of ECHT, including those, who were not able to attend the workshop, to support this project by attending to the following tasks **until June 14th**:

a.) Review and comment this short report

Have a careful look at this short report and comment on aspects you consider worth noting or addressing (e.g. if you have another opinion or want to add something). We will then publish this report on our project website.

b.) Review future projections

Please carefully review all 16 future projections and their justifications as well as their likeliness and comment on aspects you consider worth noting or addressing (e.g. if you have another opinion or want to add something). We will then use the future projections as a basis for the next step filling out the Consistency Matrix.

c.) Rank the 16 influencing factors

Use the separate template, to rank the 16 influencing factors based on the level of importance – from your point of view. Please give every factor a number from 1 to 16. Feel free to discuss your ratings internally with your team.

For questions and remarks contact
▶ Jonas Rehn-Groenendijk | jonas.rehn@h-da.de
▶ Rebecca Niebler | rebecca.niebler@h-da.de

Interreg Co-funded by the European Union
North-West Europe
ECHT

Appendix 1

Projections of all 16 influencing factors (consolidated version of the results of workshop #2)

1 Regulatory framework EU for traceability of chemicals in textile apparel

(Relevance: **HIGH** | Impact: **DRIVING**)

Definition

Describes the legal framework in the EU for the traceability of chemicals in textiles and includes laws, regulations and directives issued by government authorities. The regulations can affect the entire value chain.

Status Quo	Projection A 2035		Justification
Currently, a number of legislations regarding traceability and transparency are in place on EU level (e.g. REACH,). While they do have an effect on all (global) value chains, they show very low requirements regarding reporting duties – *for article producers and other downstream users*. Furthermore, potential sanctions for non- complaint behaviour is very low. Further regulations are planned (e.g. EU ESPR) From a regulatory point of view, there is a large difference between *article producers* (e.g. shirts) and *chemical producers*. While chemical producers are very strictly controlled, importing articles from outside EU is less controlled according to the REACH regulation. Typically, textile articles are produced outside the EU and are imported as products and thus are less strongly regulated. Furthermore, the two regulations REACH and ESPR differ conceptually. REACH refers to a specific list of chemicals *in a product (defined as "article" under REACH)* that need to be reported (SVHC). ESPR also covers chemicals in a given production process that have to be reported - even if the right detection method is not available yet - and even if the substance is not noticeable in the final product anymore. This means harmful chemicals could still be used in the process and not be reported.	**Significantly stricter EU regulations** EU regulations on traceability and transparency become much stricter. More industry specific duties regarding reporting of substances both in product and process chemicals are defined and specific sanctions for non-compliance are in place.	Likelihood: 80%	No willingness on the part of the industry (textile and chemical) to achieve greater traceability on its own. Stricter regulations are needed to force companies in the value chain to provide detailed and consistent reporting. Increased pressure from the critical public opinion
	Projection B 2035		**Justification**
	Continuously delay in planned changes in EU regulations Planned changes in EU regulations are strongly delayed and thus de facto there is not much change compared to 2024.	Likelihood: 20%	EU commission is not able to agree on a common goal / approach. Lobbying from different sides makes things more difficult.

2 Regulatory framework global for traceability of chemicals in textiles

(Relevance: **HIGH** | Impact: **DRIVING**)

Definition

Describes the global legal framework for the traceability of chemicals in textiles including laws, regulations and directives issued by government authorities and the degree of alignment with EU legislation. The regulations can affect the entire value chain.

<table>
<tr><th colspan="3">Status Quo</th></tr>
<tr><td rowspan="4">EU legislation is used here as a reference point. On a global level there is no harmonised system in place. Every market is different with different local requirements, which makes the regulatory landscape rather fragmented.

Furthermore new requirements are coming up all the time due to different policies in different countries, like the US “Extended Producer Responsibility”, the “Ecodesign for Sustainable Products Regulation (ESPR)” in Europe or the new version of “Technical Regulations for Textile Products” in Saudi Arabia (and India). Therefore, it is hard to grasp all details and specifications of the requirements and get a comprehensive understanding of the (global) situation.

A major concern is the lack of adequate requirements in many producing/developing countries, which are particularly relevant in the context of imports (to the EU).</td><td>Global Agreement
A global agreement is being sought in a joint effort (like the “Automotive Industry Guiding Principles to Enhance Sustainability Performance in the Supply Chain”).</td><td>In developing countries wealth is growing and therefore interest in topics and aspects of health and sustainability are growing too.
The “Digital Product Passport (DPP)” is mandatory (including parties that import into the EU) and combined with efficient enforcement, is creating a level playing field worldwide and making further steps towards a common global agreement possible.</td></tr>
<tr><td>10%</td></tr>
<tr><td>Projection B 2035</td><td>Justification</td></tr>
<tr><td>Higher level of deharmonisation
Further deharmonisation concerning legislation is taking place as nationalism and deglobalisation continue to grow. Efforts for an agreement within the EU are losing support, and there is no interest for a global agreement.

Likelihood: 30%</td><td>The global political landscape shows further decrease in cooperation that is already weakening international organisations (and also potentially the EU), whereas the US or China profit from this scenario.
China and other major players/consortia (like Africa, India, and the US) are not interested in adding further/stricter requirements in production and strive first and foremost for competitiveness.</td></tr>
<tr><td>Projection C 2035</td><td>Justification</td></tr>
<tr><td>Slight harmonisation
The current developments and efforts of slight harmonisation on a global level are continued.

Likelihood: 60%</td><td>Although, there are few developments/plans on the horizon on a global level (e.g. initiated by UNEP), the continuation of current projects/ initiatives such as ZDHC and others will lead to a slight increase of harmonisation – primarily in the EU.</td></tr>
</table>

3 Standardisation on EU- and global level

(Relevance: **HIGH** | Impact: **BALANCED**)

Definition

Describes the degree of standardisation of chemical traceability (on EU and global level), including information requirements and information formats.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="5">Currently, there are various standards on global, EU and national level (e.g. EU Standards developed by CEN and CENELEC, ZDHC, UNECE) leading to standards for labelling.

There is a wide range of labels (e.g. eco labels) and standards but hardly any long lasting and globally shared and implemented standards in terms of traceability (especially regarding data, format, privacy and other traceability issues).</td><td colspan="2">Global standards established
Driven by industry actors for enabling traceability, sector-wide global standards are established and implemented regarding data, provision of information, formats, privacy and such.</td><td rowspan="2">Due to changes in the regulatory framework and needs in the industry to streamline processes global standards are established.</td></tr>
<tr><td>Likelihood:</td><td>70%</td></tr>
<tr><th colspan="2">Projection B 2035</th><th>Justification</th></tr>
<tr><td colspan="2">No significant improvements
Current standards are on the way but are inconsistent and local and thus no significant improvements in terms of standardisation are made.</td><td rowspan="2">Efforts are done only in niches, regionally/nationally or by single actors. Therefore innovations and approaches do not reach enough momentum.</td></tr>
<tr><td>Likelihood:</td><td>30%</td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td></td></tr>
</table>

4 Enforcement pressure in the industry

(Relevance: **HIGH** | Impact: **DRIVING**)

Definition

Describes the enforcement/realisation pressure by authorities onto the industry.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="5">The enforcement pressure differs with every sector and member state. Penalties and financial sanctions are often not imposed. Therefore, there is no real pressure to comply with regulations.

There are considerable differences between the EU and other countries. Every country has different institutions for control and no harmonised system is in place. The EU is mainly the driver in this, as well as NGOs.

There is already some level of cooperation (among peers and partners (NGOs)) in place and therefore a certain amount of interest is evident.</td><td colspan="2">Strong enforcement pressure, mainly exerted by authorities
The “Green Deal” and all associated strategies are largely enforced by national administrations. Authorities cooperate effectively and thus have more influence concerning compliance.</td><td rowspan="2">The “Green Deal” and its associated strategies are already in place. Due to full transparency in an open system and rigorous product identification, higher enforcement pressure becomes effective.</td></tr>
<tr><td>Likelihood:</td><td>70%</td></tr>
<tr><th></th><th colspan="2">Projection B 2035</th><th>Justification</th></tr>
<tr><td colspan="2">Slightly more enforcement pressure, exerted mainly by peers
Enforcement pressure is exerted more by peers and less by authorities.</td><td rowspan="2">Increased cooperation (among peers and partners (NGOs))
Increased cooperation among industry actors (“peer pressure”). The level of standardisation, mutual communication and understanding are increasing.</td></tr>
<tr><td>Likelihood:</td><td>30%</td></tr>
<tr><th></th><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
</table>

5 Scientific knowledge about chemical substances

(Relevance: **MEDIUM** | Impact: **BALANCED**)

Definition

Describes the degree of scientific knowledge on chemical substances and the share of substances that can be assessed ("new" substances of concerns) and for which a toxicity profile is available.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="4">Each party involved must contribute their own knowledge, particularly regarding REACH legislation. However, data integration remains an issue, as some companies must request information separately due to confidentiality concerns. Although knowledge exists, sharing it poses challenges, compounded by controversial methodologies.
Furthermore, toxicity knowledge regarding the hazard of substances is limited and a need for hazard studies is evident.
Moreover, when substances are up for restriction, companies with greater resources can invest in generating additional knowledge to argue against limitations, potentially skewing outcomes. The principle of scientific independence is occasionally compromised in this process, as for instance in some cases, results that are inconvenient are concealed or research designs are biased towards more attractable outcomes.</td><td colspan="2">Only generic knowledge is generated, uneven distribution
The status quo persists. Although, knowledge and awareness on chemical substances grows, it is only on a generic level, without detailed information (e.g. toxicity profiles). Industry (textile & chemical) acts only where necessary.</td><td rowspan="2">Industry actors – especially chemical suppliers - do not benefit from sharing information. There is a lack of educational background to understand the information.</td></tr>
<tr><td>Likelihood:</td><td>70%</td></tr>
<tr><th colspan="2">Projection B 2035</th><th>Justification</th></tr>
<tr><td colspan="2">Higher knowledge on a detailed level, greater dissemination
New structures – supported by the industry - are in place to help distribute information (e.g. industry-wide European fashion help-desk and a platform). Knowledge output from academia and industry grows significantly.</td><td rowspan="2">Many companies – including SMEs - face the same challenges with regulatory requirements. Industry actors recognise benefits from generating and distributing knowledge and form cooperation (meso-level).</td></tr>
<tr><td>Likelihood:</td><td>30%</td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td></td></tr>
</table>

6 Innovations in detection methods

(Relevance: **LOW** | Impact: **DRIVEN**)

Definition

Describes the development of new approaches to identifying specific chemical substances in a given material.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">There are thousands of chemicals relevant for testing and reporting. For many of these substances no test method is developed (even if regulated). The existing detection methods urgently need updates.

Detection methods can be quite pricy considering the high number of chemicals to be tested according to regulatory obligations.

Despite efforts by OECD, there is currently no standardisation for detection methods (e.g. country specific differences exist). This diversity leads to less robust and less reproducible test results.</td><td colspan="2">Variety of elaborated methods, increased standardisation and automation
On the one hand, methods become more elaborated and diversified but therefore also more expensive. Testing can be lowered in the value chains and if used focus primarily on testing the final product.

On the other hand, some of the methods have become more automated and standardised (potentially supported by artificial intelligence) and thus become more effective and cheaper. Testing methods are designed in a more complex manner and include tests during production phase as well.</td><td rowspan="2">Due to regulatory pressure chemicals have to be reported in lower percentages making it necessary to develop more refined detection methods.
At the same time, new certification processes and cooperations lead to more certified chemicals that are used and tracked throughout the value chain. For these substances, tests become less important.
For all other substances, new technologies and insights in basic research lead to more readily available solutions and scaling up of experimental solutions. For instance, detection methods that are integrated into the production process reduce time and other necessary resources.</td></tr>
<tr><td>Likelihood:</td><td>100%</td></tr>
<tr><th colspan="2">Projection B 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
</table>

7 Innovations in traceability technology

(Relevance: **MEDIUM** | Impact: **DRIVEN**)

Definition

Describes the development and successful dissemination of physical (e.g. scanners) and non-physical (software) elements of the technical infrastructure for sharing information along the entire value chains.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">At the moment, there are no optimised tools and protocols to manage complex value chains and using respective tools is costly.

There are technologies like Block Chain, AI, RFID, and NFC (Near Field Communication) on the market and used in other sectors and innovations. However, investments in this area are rather low.

Current advancements in traceability technology do not acknowledge the complexity of global textile value chains. There are hardly any new protocols and applications that make use of the currently available technologies.

There are currently no industry-wide specific working groups concerning traceability technology.</td><td colspan="2">Progress in high quality standardised solutions
Innovations in traceability technology are made - based on a joint effort - referring specifically to the clarity of data and processes.</td><td rowspan="2">ECHT project and others lead the way towards more standardisation regarding data and technology in this field (see construction industry: “Material Passport”). Industry actors form specific working groups concerning traceability technology.</td></tr>
<tr><td>Likelihood:</td><td>60%</td></tr>
<tr><th>Projection B 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2">Many and less effective isolated solutions
A number of individual players push their innovations on the market. Several smaller and often isolated innovations are appearing, not necessarily delivering a high quality or effective solutions.</td><td rowspan="2">Industry is interested in potential solutions and therefore offers monetarisation. This leads to stronger competition between technology providers. There is no overall agreement on standards concerning data or technology (cf. Apple/Microsoft).</td></tr>
<tr><td>Likelihood:</td><td>40%</td></tr>
<tr><th>Projection C 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
</table>

8 Innovations textile technology

(Relevance: **LOW** | Impact: **DRIVEN**)

Definition

Describes the development and successful dissemination of new approaches to the production of raw material, manufacturing and recycling processes (e.g. automated chemical detection) as well as product design (e.g. 3D printing).

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">At the moment there is a boom in new technologies regarding recycling, which is to some extent driven by legal requirements, profit and consumer expectations. However, producers are not willing to create a market for recycled fibres and second-hand clothes, because virgin material is cheaper, consumers perceive a high recycling rate in clothes as negative and there is a growing, yetlimited demand for second-hand clothing. As extended producer responsibility (ERP) is not widespread yet, there are also no business models for manufacturers to this point.

Other textile innovations (e.g. 3D printing) are currently rather niche developments.</td><td colspan="2">Recycling technologies have evolved, slow emergence of innovations in all other technologies
Recycling technologies have evolved and there is a demand for recycled textile materials. Channels and technologies for sorting and reuse are established.</td><td rowspan="2">There is a shortage of virgin materials and recyclability is already considered in the design phase of clothing.
New technologies make recycling and reuse competitive, while the use of recycled materials in garments and reused clothing becomes normal to the consumer.
Tracking technologies have evolved and legislation pushes for innovation, fostering an environment where innovations get promoted. As opposed to other technologies, recycling represents the strongest business model.</td></tr>
<tr><td>Likelihood:</td><td>60%</td></tr>
<tr><th colspan="2">Projection B 2035</th><th>Justification</th></tr>
<tr><td colspan="2">Slow emergence of innovations
This applies to all technologies, including recycling technologies</td><td rowspan="2">It is difficult for the industry to develop and choose the most promising new technologies. The complexity of the regulatory landscape creates a hostile environment towards innovations. Research and development (R&D) activities in companies require considerable investments.
Recycling and sorting technologies are not competitive and consumers do not accept high recycling rates in clothes.</td></tr>
<tr><td>Likelihood:</td><td>40%</td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
</table>

9 Consumer behaviour

(Relevance: **MEDIUM** | Impact: **DRIVING**)

Definition

Describes consumers' understanding of chemical traceability and informed decision making according to circular economy standards (purchase, use and disposal).

Status Quo	Projection A 2035		Justification
Price and fashion determine consumer behaviour. Furthermore, specific properties aimed at particular applications are another factor that consumer consider (e.g. water-repellent properties).There is a lack of understanding about harmful chemicals in clothes, a lack of knowledge about the rights consumers have in terms of chemical traceability and a lack of awareness that legislation is sometimes not complied with (e.g. shein). The younger generation is fighting for nature but is also attracted by cheap ultra-fast fashion offers.	**Sustainability is the main purchasing criterion; new business models for reused and recycled apparel evolved** Consumers have the necessary knowledge of chemicals in clothing and buy accordingly more sustainable clothes. They use, reuse and dispose of apparel in a more sustainable manner.		Consumers have easy to use information about chemicals in clothes at hand. The media and public opinion regularly report on chemicals in clothing putting the issue into focus. Law against fast-fashion come into force in different member states of the EU (e.g. taxation for fast-fashion products- see France). The price of non-toxic and durable clothing is decreasing, making it more affordable compared to other clothing. New business models (e.g. for reused and recycled apparel) become more common.
	Likelihood:	40%	
	Projection B 2035		**Justification**
	Price is the main purchasing criterion; second-hand is more attractive Consumers have more knowledge of chemicals, but price is still decisive for purchase. Second-hand options become more attractive.		Consumers have more information of chemicals in clothes at hand. The media and public opinion regularly report on chemicals in clothing putting the issue in focus. There are still higher prices for more sustainable (i.a. toxic-free and durable) clothes leading to a higher demand of cheaper but toxic-free used apparel.
	Likelihood:	60%	
	Projection C 2035		**Justification**
	Likelihood:		

10 Critical public opinion

(Relevance: **LOW** | Impact: **BALANCED**)

Definition

Describes the extent to which public perception is critical regarding the management of chemical substances in the apparel industry. Critical public opinion is represented by the press, social media, NGOs, and consumers.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">Critical public opinion plays a significant role in the management of chemical substances in the apparel industry. It exerts pressure both on industry and policy makers.
The general public is not in a position to make an informed decision: There is a lack of sufficient access to and knowledge of the data regarding the complex processes in the industry. Furthermore, public opinion can be heavily influenced by different interest groups (e.g. industry, policy makers).</td><td colspan="2">Increased knowledge, understanding and trust as well as collaboration
Increased transparency leads to greater knowledge, understanding and trust by the critical public opinion allowing a more differentiated point of view.
Critical public opinion and value chain actors collaborate more actively and follow a shared goal represented by regulatory requirements.</td><td rowspan="2">Based on a significant increase in transparency and traceability by value chain actors, the critical public opinion has more profound access to crucial information necessary to make informed judgements.
Value chain actors provide data in a suitable way for each target group. Basic knowledge is provided to the public to help them understand the process, and citizens are included in the development of projects. Technologies for clear labelling on textiles are employed to ensure transparency.</td></tr>
<tr><td>Likelihood:</td><td>50%</td></tr>
<tr><th>Projection B 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2">Still fragmented, no access to information; heavily influenced by lobbyists
The critical public opinion is fragmented and parts of it (i.e. consumers) lack substantial information from value chain actors. Industry actors influence the critical public opinion with easy to comprehend stories regarding sustainable development including unsubstantiated green claims (“green washing”).</td><td rowspan="2">Modes of operation and business models of media outlets (esp. social media) focus on short and easy to understand narratives making it more difficult to convey complex and multifaceted knowledge. A continuing lack of transparency by value chain actors further decreases trust by the critical public opinion. A lack of communication and collaboration between value chain actors and public opinion increased barriers and misconceptions.</td></tr>
<tr><td>Likelihood:</td><td>50%</td></tr>
<tr><th>Projection C 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
</table>

11 Locations factors (political, social, economic, ecological)

(Relevance: **LOW** | Impact: **BALANCED**)

Definition

Describes the political, social, cultural and ecological conditions and developments throughout the value chains and the related level of risk for the apparel sector.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="8">Location factors across all global value chains differ greatly. The political situation in various parts of the value chain is complex and diverse. A significant gap between developed and developing countries is manifested in various work and safety standards, levels of democracy, etc.</td><td colspan="2">Globally more equalised location factors
The social, economic and political situation in developing countries of the world improve.</td><td rowspan="2">The markets (especially in the textile industry) become more globalised - i.e. due to DPP and new global business models.</td></tr>
<tr><td>Likelihood:</td><td>40%</td></tr>
<tr><th>Projection B 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2">Globally more unequalised location factors present
The current gap between most consumption and production countries (especially in South East Asia) becomes bigger while to some extent the standards are lifted for all.</td><td rowspan="2">Due to political uncertainties and destabilisation, countries - especially producing countries - become more protective and restrict market access. Climate change adds pressure to this as well (e.g. water shortage).</td></tr>
<tr><td>Likelihood:</td><td>60%</td></tr>
<tr><th>Projection C 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2"></td><td></td></tr>
<tr><td>Likelihood:</td><td></td><td></td></tr>
</table>

12 Mindset in the industry

(Relevance: **MEDIUM** | Impact: **BALANCED**)

Definition

Describes the motivation of the industry to become active in terms of traceability as a sign of taking responsibility and act accordingly.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">The current mindset in the industry is mainly driven by business interests. At the moment just mandatory information are reported by the industry (following the regulations of the EU) and hardly any actions regarding traceability and transparency are taken beyond the regulatory necessities due to costs, reputational or legal risks and disadvantages compared to competitors.</td><td colspan="2">More active and transparent mindset
Safe and clear playing field for all companies to communicate their list of used chemicals.
Reassured by respective regulations and standards, industry actors develop a more active and transparent mindset.</td><td rowspan="2">As sector-wide rules on traceability and transparency increase, disadvantages for proactive industry actors become less likely and an overall change in mindset becomes less risky.</td></tr>
<tr><td>Likelihood:</td><td>40%</td></tr>
<tr><th>Projection B 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2">No interest for change in the industry
(Information pull)</td><td rowspan="2">Currently legislation is “faster” than any actions led by intrinsic motivation. There seems to be no interest for change and the industry sees no way for profit in this scenario.</td></tr>
<tr><td>Likelihood:</td><td>50%</td></tr>
<tr><th>Projection C 2035</th><th colspan="2">Justification</th></tr>
<tr><td colspan="2">Proactive and transparent mindset
The industry develops a proactive and transparent mindset due to intrinsic motivation and a systemic understanding of the consequences of their individual actions regarding a sustainable development. The industry uses this high level of traceability for marketing/branding purposes (information push).</td><td rowspan="2">Critical public opinion and the individual increased awareness of decision makers in the industry changes the way, actors prioritise their activities. Change and proactive behaviour could help monetise traceability.</td></tr>
<tr><td>Likelihood:</td><td>10%</td></tr>
</table>

13 Traceability capacity in the value chain

(Relevance: **MEDIUM** | Impact: **DRIVEN**)

Definition

Describes the level of knowledge, and availability of resources and manpower in the value chain to collect, stock, manage, communicate, secure and complete the data about chemicals along the value chain.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">There is very limited or no traceability capacity along the value chain. It is difficult for companies to keep track of chemicals along value chains, e.g. because suppliers do not provide such information (e.g. due to confidential business information (CBI)) and most of the value chain is located outside of EU.
In addition, there are no optimised tools and protocols to manage a complex value chain and using respective tools is costly.
However, the awareness and pressure about the topic is increasing.</td><td colspan="2">Significantly increased capacities
Traceability capacity increases significantly along the entire value chain. The industry heavily invests in technology and experts with regard to chemicals' traceability.
The capacity of value chain actors in the EU and non-EU is growing to run traceability systems.</td><td rowspan="2">The “Ecodesign Regulation” (ESPR) with the DPP is fully implemented. The regulatory landscape requires traceability. In addition, the public demands traceability as well.
Product identification is possible through a standardised system, e.g. barcodes, Nano-technology.
It is easy to provide and access information and follow necessary steps in the process, since digital technologies are developed and an open source system with easy access is in place.
Harmonised industry standards are in place, which are based on regulations or voluntary initiatives.</td></tr>
<tr><td>Likelihood:</td><td>70%</td></tr>
<tr><th colspan="2">Projection B 2035</th><th>Justification</th></tr>
<tr><td colspan="2">Slightly improved capacities
There is a slightly improved traceability capacity along the entire value chain.</td><td rowspan="2">Although regulatory developments put pressure on industry actors to invest in traceability capacity, a lack of standards and effective approaches (e.g. know-how) makes it difficult for the industry to comprehensively implement traceability and less economically feasible to invest in capacity building.</td></tr>
<tr><td>Likelihood:</td><td>30%</td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
</table>

14 Cooperation among peers on aspects of traceability

(Relevance: **MEDIUM** | Impact: **BALANCED**)

Definition

Describes the intensity of cooperation between two or more (potential) competitors and if necessary a neutral party to reach a common ground to trace the chemicals in the apparel sector.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="4">At the moment there is no direct communication between brands (they do not share what chemicals are used in the value chain), but there is some kind of cooperation through third parties.
Regarding the restriction of chemicals there is cooperation, e.g. working groups to set up protocols and manufacturing restricted substances list (MRSLs) in the ZDHC.
However, there is no further cooperation regarding the traceability of chemicals. It is not discussed yet how to cooperate to get the information (and if so, how to manage the input), especially from the chemical industry, but also in the whole value chain. The question remains as to who should be responsible (to register and) transmit the information.
Brands are requesting information about the chemicals used in the processes (pushing for ingredient lists) over a joint platform (ZDHC gateway). However, the link from the inventory list to a specific product is still missing.</td><td colspan="2">Widespread cooperation
Competitors and other stakeholders fully cooperate in terms of chemical traceability.
They exchange more information. All stakeholders are aligned and “move in the same direction”.</td><td rowspan="2">New regulations are in place that push for closer cooperation: The pressure of authorities increases.
Problems and errors – with potential legal implications – occur if everyone is requesting different information.
There is a desire by the industry to be more sustainable.
There is closer cooperation between peers in general, as well as other organisations and NGOs. Multi-stakeholder associations appear.</td></tr>
<tr><td>Likelihood:</td><td>60%</td></tr>
<tr><th colspan="2">Projection B 2035</th><th>Justification</th></tr>
<tr><td colspan="2">Cooperation between bigger companies
The cooperation among peers focuses on bigger companies.</td><td rowspan="2">The resource-intensity of cooperating makes it not possible for smaller brands to participate and cooperate. Supportive multi-stakeholder initiatives and other third parties are missing to integrate e.g. SMEs.</td></tr>
<tr><td>Likelihood:</td><td>30%</td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2">Very limited cooperation
There is only limited cooperation due to restricted transparency.</td><td rowspan="2">Anti-trust laws hinder cooperation, and nobody wants to disclose their “secret” ingredients.
Authorities are protecting the privacy of the chemical industry for economic and political reasons.
The industry fears that their own business will suffer as a result of increased cooperation.</td></tr>
<tr><td>Likelihood:</td><td>10%</td></tr>
</table>

15 Cooperation along value chain on aspects of traceability

(Relevance: **HIGH** | Impact: **BALANCED**)

Definition

Describes the intensity of cooperation along the various value chain stakeholders (incl. the ability and willingness to be transparent and the perception of data protection aspects).

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">Currently, there is limited interaction and information flow within the apparel industry. This is partly due to a lack of willingness to share information and partly the confidentiality of business information. Environmental Product Declarations (EPDs) are partially utilised, providing some information on the value chain, but not all stakeholders are willing to share their data. Participants often use different models and individual solutions. In the fashion industry, there are some initiatives and collaborations, such as the retrace platform. Although there are many harmonised platforms available, they are not used properly, leading to a lack of collaboration along the value chains.</td><td colspan="2">Intensive cooperation
Intensive cooperation along global value chains based on global regulation.</td><td rowspan="2">Global regulations lead to one or few easy-to-access standards or systems (e.g. ISO), which are established worldwide for all value chain stakeholders. The automotive sector serves as a good example, with its well-integrated and universally accepted systems that ensure consistent information flow and collaboration across the entire value chain. Adopting a similar approach in the textile industry has enhanced data sharing, transparency, and overall efficiency.</td></tr>
<tr><td>Likelihood:</td><td>15%</td></tr>
<tr><th colspan="3">Projection B 2035</th></tr>
<tr><td colspan="2">Limited cooperation (like in 2024)
Hardly any advances are made regarding cooperation along value chains on aspects of traceability. Value chain actors remain to be protective of their individual sets of information.</td><td rowspan="2">Deglobalisation and competition prevent global harmonisation. While global harmonisation remains elusive, harmonisation within EU value chains is improved slightly, but there is not sufficient market pull to convince suppliers outside EU. National efforts are ongoing, and these initiatives are gradually being integrated - also outside of the EU.</td></tr>
<tr><td>Likelihood:</td><td>70%</td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2">Almost no cooperation (less than in 2024)
Both globally and in the EU, efforts regarding traceability and transparency become even less effective.</td><td rowspan="2">Due to shifts in the elections and stronger nationalism, the planned implementation of a regulatory framework in the EU is not achieved. A weaker EU has an overall effect on global business structures and eventually leads to deglobalised, more protective and less transparent markets.</td></tr>
<tr><td>Likelihood:</td><td>15%</td></tr>
</table>

16 Traceability related business models

(Relevance: **LOW** | Impact: **DRIVEN**)

Definition

Describes to what extent new business models and value chain actors related to traceability of chemical substances are successfully introduced to the global market.

<table>
<tr><th>Status Quo</th><th colspan="2">Projection A 2035</th><th>Justification</th></tr>
<tr><td rowspan="6">Traceability-related business models in the apparel industry are currently not the most popular or well known. First attempts in this field are often not fully developed.
Approaches – however not related to chemicals traceability - include GOTS for organic cotton and other certificates like OEKO-TEX and Bluesign. Additionally, there is the MRSL-tracking initiative/business model, which assists in tracing substances along the value chain.
Overall, there is a lack of effective business models that make use of traceability and information on chemical substances in products and processes.</td><td colspan="2">Viable business models entered the market
Traceability as a Service (like “Software as a Service” offered by IT-companies/consultants) is growing.
Industry actors have developed viable business models that make use of information on chemical substances in products and processes.</td><td rowspan="2">The implementation of new regulations is leading to a higher demand for effective management practices. Fortunately, there is already a base of knowledge and tracking technologies in place to support these efforts and new software is developed. Based on these prerequisites, industry actors become more innovative and courageous to invest and try new traceability related business models.</td></tr>
<tr><td>Likelihood:</td><td>30%</td></tr>
<tr><th colspan="3">Projection B 2035</th></tr>
<tr><td colspan="2">Only few and rather niche oriented viable business models
Viable business model are limited to niches partly profiting from the recycling push. However, overall traceability remains to be costly and economically unfeasible.</td><td rowspan="2">Limited access to technology, particularly at the start of the value chain, present challenges for effective chemical management.
Low effectiveness of software due to lack of accurate data and also inconsistent use. Moreover, the inherent complexity of the value chain further complicates efforts in this regard.</td></tr>
<tr><td>Likelihood:</td><td>70%</td></tr>
<tr><th colspan="2">Projection C 2035</th><th>Justification</th></tr>
<tr><td colspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Likelihood:</td><td></td></tr>
</table>