

Indicators for chemical information transfer in the textile value chain



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1. SUMMARY

The global textiles sector has doubled in production over the last 15 years, and it is expected to increase further¹. This industry has a profound environmental impact, both on aspects such as land and water use as well as greenhouse gas emissions but also from the extensive use of chemicals in the production. Less than 1 percent of all textiles used to produce clothing is recycled and used in new clothing², a considerable problem that must be tackled to enable a sustainable and resource efficient product life cycle and to contribute to reaching several of the UN Sustainable Development Goals. The occurrence of hazardous chemical substances in certain textiles and the lack of information on such content is one of the obstacles that must be overcome since these substances can impede recycling processes, make further use unlawful or pose risks to the consumers. Improved tracking and sharing of chemical information throughout the textile value chain is needed and could contribute to an increase of both chemical safety and sustainable material use.

At the upcoming fifth session of the International Conference on Chemicals Management (ICCM5) scheduled in 2023, discussions will revolve around a renewed global framework for the reduction of harm from chemicals and waste through sound management. For this new framework, objectives and targets will have to be agreed and in addition, a set of indicators to follow up on the progress are to be developed by the various stakeholders. This report aims to offer a background that can feed into discussions related to suitable indicators by providing a description of the current situation, input from stakeholders in the textile industry, identify information gaps for chemicals in textile value chains and give suggestions for possible indicators to be developed.

To do this, in addition to a short literature study, stakeholders involved in the textile industry, most from their positions as brand-owners, were identified and contacted to collect their views on the topic regarding chemical information flow and possible indicators for following its progress via interviews. After collating the received information, a gap analysis was performed and suggestions for possible indicators was drafted.

The results from the interviews performed in this study confirms the general perception that textile supply chains are complex and global. Varying and specialized production processes require large numbers of suppliers and sub-suppliers that are scattered globally which adds to the complexity of the value chain. Chemicals are used in all these processes and by the different suppliers and the often many actors between a brand owner and sub-supplier (tiers) makes the information transfer difficult. Some difficulties can be overcome by having local offices in the production countries, something that several of the interviewed companies have. Despite this, all companies mention the necessity to validate received information, a task that is both time and resource consuming. The most used method to communicate

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1. Ellen MacArthur Foundation, 2017- A New Textiles Economy: Redesigning Fashion's Future. <https://emf.thirdlight.com/link/2axvc7eob8zx-za4ule/@/preview/1?o>
 2. UNEP, 2019. Global Chemicals Outlook II. <https://wedocs.unep.org/bitstream/handle/20.500.11822/28113/GCOII.pdf?sequence=1&isAllowed=y>

chemical information in the textile supply chain is using restricted substance lists (RSLs) and manufacturing restricted substances list (MRSL). These lists specify which chemicals and which limit values that must not be exceeded for the finished products and during production respectively. To show compliance, the core type of chemical information through the supply chain is mainly based on communication of safety data sheets and test reports, both of which can vary significantly in quality. Currently, most information in the textile supply chain is therefore based on "negative information" i.e., information on absence of certain substances as opposed to "positive information" listing which chemicals that are used to produce a certain garment or product.

Although there is interest from companies to improve the situation and increase the information flow, there is a need for a common tool to track chemicals and score finished products and their impact in terms of chemicals. Some of the interviewed stakeholders believe that it could be possible to further develop already existing systems such as systems used for sustainability purposes. Many of these systems are however based on life cycle analysis that do not sufficiently take chemicals into account. It appears as if the textile industry has not experienced enough pressure from regulators, policymakers, clients or consumers to develop systems that can handle this task.

If the flow of chemical information were to improve, the recipients of that information would be the companies themselves, business clients and ideally, textile recyclers. A common opinion amongst the interviewed companies was that customers are generally neither interested nor capable of handling more information about chemicals content. Customer's interest in chemical content usually follows the societal debate and the type of substances that are being discussed, e.g., PFAS in recent years. Textile recyclers would however benefit from more knowledge about chemical content since this unknown content is problematic and may render some materials unfeasible to recycle. Currently, the availability of recycled textile material is low and for those materials that are available, there are sometimes uncertainties regarding its origin which may require third-party verification.

When asked about indicators for flow of chemical information, the interviewed stakeholders points towards an increasing trend for transparency of information and that this could be a potential indicator. To get there, companies believe that there may be a need for harmonised legal requirements. No existing indicators for chemical information flow was identified in this project. From the collected information, suggestions for two indicators were created.

Textile companies commonly make use of RSLs to collect chemical information. These RSLs vary in content between companies and are too different to be used as indicators themselves. Industry initiatives to harmonise the requirements in RSLs have been realised through e.g., the AFIRM RSL. Use of this RSL and other commonly agreed RSLs of a similar scope could be used to indicate increases in chemical information flow as they require a certain amount of information to be complied with. By measuring the development in the number of companies implementing these requirements (e.g., by surveys), an indicator for increased information flow could be accomplished.

A second indicator could be to measure transparency of chemical information, i.e., measuring the amount/share/percentage of a company's production for which there

is transparency or traceability when it comes to chemical content. This would offer several advantages, one being actual information on presence of used chemicals. This information would also, in contrast to "negative information", have the potential to provide textile recyclers with all the information they need to decide how to handle a certain garment or article.



Photo: Faramarz Gosheh/imagebank.sweden.se

2. BACKGROUND AND OBJECTIVE

Global chemical production and use has been increasing for several decades and the size of the global chemical industry was estimated to have exceeded 5 trillion US dollars in 2017 and expected to double by 2030³. The increased and innovative use of chemicals has led to many of the technological and societal developments that many global citizens encounter and expect in their everyday life. This increased use also brings exposure and leakage of a complex mix of chemical substances that are part of the materials and products that surround us and whose effects may be challenging to discover. To face this threat, the international community has acted and together agreed to phase out and lessen the effects from use of certain hazardous substances, example of this are e.g., the Montreal Protocol (substances that deplete the ozone Layer), the Stockholm Convention (on persistent organic pollutants (POPs)) and the Minamata Convention (on Mercury).

As a part of this international cooperation, the Strategic Approach to International Chemicals Management (SAICM) was adopted in 2006 by the first session of the International Conference on Chemicals Management (ICCM1) as a multi- and cross-sectoral and participatory strategic approach. The purpose of SAICM was to achieve a sound management of chemicals and ensure that chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health by 2020.

Under SAICM, the Chemicals in Products (CiP) Program⁴ was established with the overall objective to assist industry, governments, NGOs and consumers on how to best exchange information on chemicals in products. The program focuses on transparency of information regarding chemicals in global supply chains and special emphasis has been put on the building materials, electronics, toys and textiles sectors.

Similarly, to chemicals, the global textiles sector has doubled in production over the last 15 years, and it is expected to increase further⁵. The textile industry has a profound environmental impact, both on aspects such as land and water use as well as greenhouse gas emissions but also from the extensive use of chemicals in the production. Less than 1 percent of all textiles used to produce clothing is recycled and used in new clothing⁶. Re-use and recycling of textiles must increase to enable a sustainable and resource effective product life cycle and to contribute to reaching several of the UN Sustainable Development Goals (SDGs). In the EU, the European Commission has recently published a strategy for sustainable and circular textiles⁷ that lays down a vision and outlines a strategy to ensure that textiles placed on the EU market are "long-lived and recyclable, to a great extent made of recycled

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3. UNEP, 2019. Global Chemicals Outlook II. <https://wedocs.unep.org/bitstream/handle/20.500.11822/28113/GCOII.pdf?sequence=1&isAllowed=y>
 4. UNEP 2020. Sustainability and Circularity in the Textile Value Chain: Global Stocktaking (unep.org)
 5. Ellen MacArthur Foundation, 2017- A New Textiles Economy: Redesigning Fashion's Future. <https://emf.thirdlight.com/link/2axvc7eob8zx-za4ule/@/preview/1?o>
 6. UNEP, 2019. Global Chemicals Outlook II. <https://wedocs.unep.org/bitstream/handle/20.500.11822/28113/GCOII.pdf?sequence=1&isAllowed=y>
 7. European Commission, 2022. EU Strategy for Sustainable and Circular Textiles. COM(2022)141 https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

fibres, free of hazardous substances and produced in respect of social rights and the environment" by 2030.

Circular economy and circular business models are often mentioned as means to reduce the pressure on natural ecosystems by circulating materials, extending their lifetime and reducing the generation of waste. One of the obstacles to succeed in this ambition is the occurrence of hazardous chemical substances in certain textiles and the lack of information on such content for those handling textiles, e.g., retailers, brand owners or textile recycling facility operators. The content of hazardous substances can impede recycling processes, make further use unlawful or pose risks to the consumers. Improved tracking and sharing of chemical information throughout the textile value chain is needed and could contribute to an increase of both chemical safety and sustainable material use.

At the upcoming fifth session of the International Conference on Chemicals Management (ICCM5) scheduled in 2023, discussions will revolve around a renewed global framework for the reduction of harm from chemicals and waste through sound management. For this framework that will succeed SAICM, new objectives and targets will have to be agreed and in addition, a set of indicators to follow up on the progress are to be developed by the various stakeholders. The process up to ICCM5 has developed a draft wording for a target connected specifically to improve information on chemicals in articles within the renewed global framework⁸. This report aims to provide input from stakeholders, background information and identify information gaps for chemicals in textile value chains that can feed into discussions related to suitable indicators for the envisaged global target on improved flow of information on chemicals in the value chain of textiles.

The report was commissioned by the Swedish Chemicals Agency (KEMI) with funding from the Nordic Chemicals Group under the Nordic Council of Ministers. Responsibility for its content rest with the authors.

8. *"By 2030, stakeholders in the value chain ensure that reliable information on chemicals in [materials and] articles is available throughout their life cycle, [including at the waste stage], to enable informed decisions and safe management of chemicals in a clean circular economy."*

3. METHODOLOGY

This study has been performed in a stepwise approach. First a small literature assessment was performed to search for relevant publications highlighting the work that has been performed on a global scale to outline the different types of chemical information exchange systems that is currently being used in the textile supply chain. This assessment also included searching for already established indicators or ongoing processes with the purpose of following progress in improving the transfer of information on chemicals in the supply chain. The information retrieved from this first step was used to design relevant questions for stakeholders.

As a second step, companies involved in the textile industry from their positions as brand-owners, were identified and contacted to collect their views on the topic regarding flow of information on chemicals and possible indicators for following its progress. However, all contacted companies did not have the time to contribute to the study. The information was collected in interviews with representatives from the companies. In one case, a written answer to questions were sent instead of participation in an interview. Emphasis was put on European textile retailing companies in agreement with KEMI for two reasons. Firstly, many of the European manufacturers have been involved in the CiP programme and are expected to be in the forefront when it comes to requirements on information exchange regarding chemicals. Secondly, these companies' participation in previous collaborations and projects facilitated the search and identification of appropriate contact persons within the company which allowed interviews to be scheduled within the relatively short timeframe of the project. This report gives the perspective of the stakeholders which contributed to the consultation, more information on the contacted stakeholders can be found in section 5.

The last step encompasses a gap analysis to determine whether any indicators identified are suitable to measure progress in the value chain of textiles and if so, if such use could be global. This step also aimed to assess if there are indicators that could cover the whole supply chain, i.e. if the information is shared all the way from manufacturer to the waste stage. In absence of established indicators, the gap analysis aimed was to identify gaps or problems that may impact the development of indicators. Finally, recommendations on possible global indicators to measure progress of improved information exchange on chemicals in textiles in the supply chain was developed based on the collected information.

4. CHEMICALS IN THE TEXTILE SUPPLY CHAIN

Textiles are part of a complex global value chain with many stages and actors for the materials to pass before they become finished products⁹. The complexity in the value chain arises due to the high number of suppliers and sub-suppliers that are scattered globally, much because of the different and specialized production processes.

A typical textile garment production chain covers textile fibres which are grown or manufactured in one country and then shipped to another country for spinning before the yarn is shipped to a third country for knitting or weaving. The fabric is thereafter sent to another location or country for colouring, processing and finally the sewing of the final garment. When it comes to the chemical content of the final products, the complexity is increased due to products containing materials and chemicals from different suppliers with different legislative requirements¹⁰. As there are many steps between the brand owner and the chemical manufacturer, and the amount of information and the number of actors the information must pass is large, this increases the complexity.

Each year in textile production it is estimated that 43 million tonnes of chemicals are used, covering more than 8000 different chemicals¹¹. The textile production is chemical-intensive as between 1.5–6.9 kg chemicals are used to produce 1 kg new textile. Chemicals are used in all phases of the production process and the amount of chemicals depends on which textile fibre is produced. Some phases in the production are more chemically intense than other, examples of such are fibre production, wet processes such as printing, after-treatment and finishing (e.g., treatment with flame retardants)¹².

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9. UNEP 2011. The Chemicals in Products Project: Case Study of the Textiles Sector. https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/27813/Textile_Sector.pdf?sequence=1&isAllowed=y
 10. European Commission 2017. Scientific and technical support for collecting information on and reviewing available tools to track hazardous substances in articles with a view to improve the implementation and enforcement of Article 33 of REACH - Publications Office of the EU (europa.eu)
 11. Swedish Chemicals Agency 2021. Rapport 4/21: Kartläggning av farliga kemiska ämnen i textil - Kemikalieinspektionen
 12. Natasja Börjeson 2017. Microsoft Word - Toxic textiles_Börjeson_DiVA.doc (diva-portal.org)

4.1 Chemical information transfer systems

Today, there are many different systems for collecting certain types of chemical information. These systems are however tailored for the needs of some stakeholders and the information is usually not complete but rather focuses on certain substances or substance groups. From earlier investigations of chemical information flow, stakeholders in the textile industry communicated that there was a lack of information in the existing systems¹³. Information on chemicals in products is needed through the whole value chain as different stakeholders need different information. In a report investigating the information collection and tools available to track hazardous substances in articles, the four main reasons to why suppliers find it difficult to provide information about substances in products were identified as¹⁴:

- They do not have the data themselves
- They are not aware of all legal obligations regarding substances in products
- They do not have the resources to collect and provide all data
- They perceive the data as confidential and hesitate to provide the information

The report concluded that companies appeared to communicate declarations of compliance rather than specific substance information. However, the information receivers highlighted the importance of more detailed information to be able to judge if the declaration of compliance is plausible or not and if the suppliers are aware of what they are declaring. The more detailed information should provide information about which substances were checked to be absent or present below which legal limit values, including relevant concentrations of substances. Although not specifically investigating textile products, the conclusions mimic those that were collected from textile companies in this study, see section 5 for more information.

Among those systems that exist today, there are only a few that includes information along several tiers of the product chain¹⁵. Existing systems within the textile industry that generates some kind of CiP information are predominantly based on sector or company restricted substance list (RSL) initiatives. Those systems are not enabling complete CiP information but are rather focused on ensuring compliance towards legislative requirements and to ensure absence of certain substances.

4.1.1 Globally Harmonised System of Classification and labelling of Chemicals (GHS)

The global manufacturing and trading of chemicals has triggered the need for an internationally harmonized approach to classification and labelling of chemicals. The main purpose of such a system is to ensure that hazardous properties can be consistently identified, and that information is transferred in a uniform and recognizable manner. The globally harmonized system of classification and labelling of chemicals (GHS) is an internationally agreed standard managed by UN created to fulfil these requirements. The GHS was adopted in December 2002 and published in 2003¹⁶. The standard includes harmonized criteria for classifying substances and

13. Kogg & Thidell 2010. Microsoft Word - Kogg_Thidell_CiP report_final (unep.org)

14. Ökopol & RPA, 2017.. Scientific and technical support for collecting information on and reviewing available tools to track hazardous substances in articles with a view to improve the implementation and enforcement of Article 33 of REACH, Section 5.1.4. <https://op.europa.eu/en/publication-detail/-/publication/58f951af-809b-11e7-b5c6-01aa75ed71a1/language-en/format-PDF>

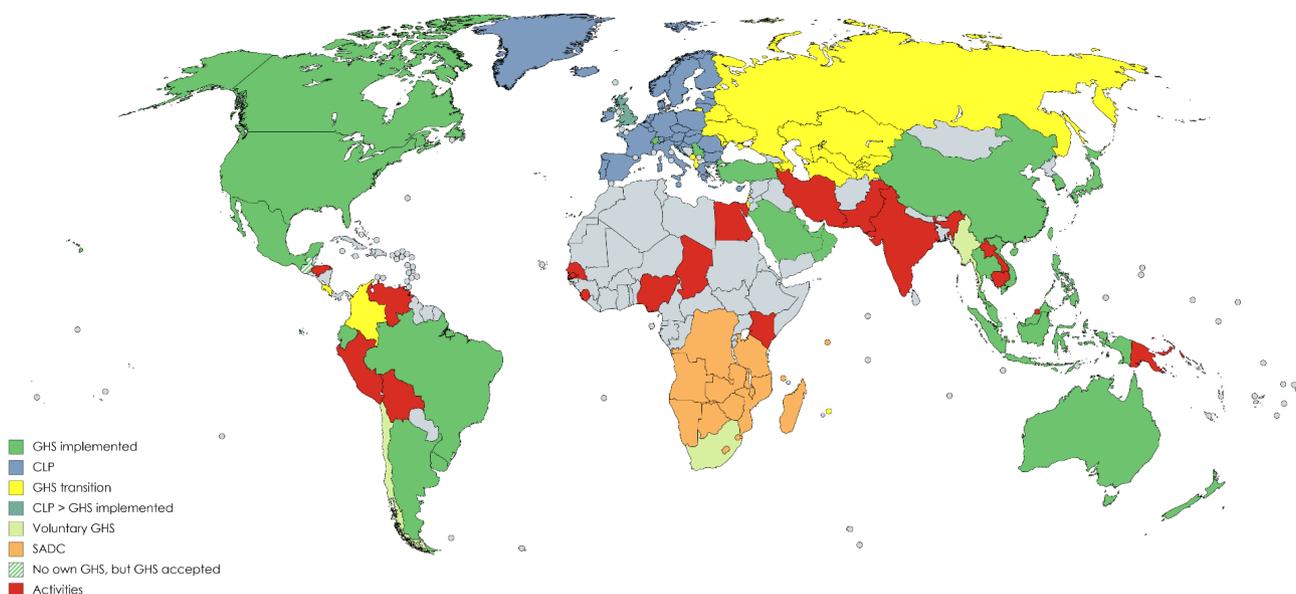
15. Kogg & Thidell 2010. Microsoft Word - Kogg_Thidell_CiP report_final (unep.org)

16. <https://unece.org/about-ghs?msclid=d92dfe32cd4211ec8f79581483b4ec1b>

mixtures according to their physical, health and environmental hazards and harmonized hazard communication element including safety data sheets and labels. Core elements in the standard are harmonized safety data sheets, universal warning pictograms and standardized hazard testing criteria.

The system is intended to provide universally accepted and easily interpreted chemical hazard information. Without this system, there is a risk that chemical information is dissimilar and that important information on hazardous properties is either not identified or misinterpreted. Despite having been available for close to 20 years, not all countries have adopted the system. In Figure 1, a graphical overview of the global implementation can be seen. In 2018, more than 120 countries had not adopted GHS¹⁷.

Figure 1. Overview of global implementation of GHS (Source: Cefic, 2020)¹⁸



4.1.2 Restricted substances lists (RSLs)

The awareness of chemicals in textiles increased in the 1980s when especially German authorities and consumer organizations started to test garments and found high concentrations of many chemicals. At that time, there were only minimal legal requirements and very few textile manufactures had a systematic approach to reduce the use of hazardous chemicals.

As a response to the growing concern about chemicals in textiles, OEKO-TEX® was founded in 1992 in Switzerland by a group of European test institutes¹⁹. The idea was to create a product label to ensure that the certified product would only contain low concentrations of a range of substances that were harmful to human health. OEKO-TEX® was the first systematic approach to avoid hazardous chemicals in textiles and

17. Cefic, 2020. GHS Network of experts, Overview of GHS implementation 2019. <https://cefic.org/app/uploads/2020/02/GHS-Implementations-report-2019.pdf>

18. Cefic, 2020. GHS Network of experts, Overview of GHS implementation 2019.

19. OEKO-TEX website, accessed 2022-05-10. <https://www.oeko-tex.com/en/news/press-releases/30-years-of-expertise-as-a-foundation-for-the-future>

is still used in 2022. The purpose of OEKO-TEX[®] was to restrict chemicals which were hazardous to human health not considering chemicals which were only hazardous to the environment. Because of this, environmentally harmful substances – like e.g. NPEO's (nonylphenol ethoxylates) were not restricted by OEKO-TEX[®] in the beginning unless they were also harmful to human health. Many manufacturing companies started to use the OEKO-TEX[®] standard as a guideline when making their own chemical requirements in what is called a restricted substance list (RSL). A RSL contains a list of the substances it regulates together with limiting values and test methods. Depending on the material, there can be different requirements for different textiles since production methods may vary.

The RSL's are company-driven, so there can be a large variation in the chemicals which are included and how they are monitored and also how this is communicated through the value chain²⁰. Often national priorities and focus area have influence on the RSL's which make them different from company to company. Company RSL are normally used primarily as an internal tool to make sure that the textiles meet legal requirements as well as the additional chemical requirements the company has, but the overall aim is to have safe products. This is also important in business to business where the customer often requests test reports. Using a RSL gives no information about which chemicals are used in the supply chain, it only makes sure that the textiles produced are meeting the limit values of each of the listed substances.

AFIRM Group (Apparel & Footwear International RSL Management Group) is a working forum of leading brands in the apparel, footwear and sporting goods industries aiming to harmonize product chemical requirements in a precompetitive space. They have developed an RSL²¹ which is now used by many leading companies both within and outside AFIRM. This RSL is public and can be used by all companies free of charge.

4.1.3 Manufacturing Restricted Substances List (MRSLs)

In 2011, Greenpeace found many hazardous substances in textiles purchased in normal shops and started to campaign against textile manufactures in the "Detox My Fashion" campaign²². This campaign put pressure on many brands and as a result they committed themselves to eliminating the hazardous substances from their textile products. The companies created an organization called ZDHC (Zero Discharge of Hazardous Substances) to find out how they could achieve the ambitious goals.

Their main outcome was a solution called MRSL (Manufacturing Restricted Substances List), something that had been used in small scale previously but that now became a commonly used tool in the industry. This list defines requirements for the process chemicals instead of having requirements for chemical residues in the finished textiles. The idea is that by having control over all chemicals used in production, it is possible to avoid having unwanted hazardous substances in the textiles as well as to protect workers and the environment. It is a much more

20. UNEP 2011. The Chemicals in Products Project: Case Study of the Textiles Sector. https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/27813/Textile_Sector.pdf?sequence=1&isAllowed=y

21. AFIRM Group, Restricted substance list. Version 07, 2022. https://afirm-group.com/wp-content/uploads/2022/02/2022_AFIRM_RSL_2022_02161.pdf

22. ZDHC Road map to zero. [Roadmap To Zero - About](#)

complex system, compared to RSL, that requires a full knowledge of parts of the supply chain which is something that is often not the case. Because of this, not all manufacturers can use an MRSL.

If suppliers of chemicals or dyes can demonstrate compliance with the requirements in the MRSL, their products are eligible to use in production which means that the textiles will be safer to wear and the wastewater from the dye house will be free from environmentally hazardous substances.

The substances listed in the MRSL are basically the same substances that might be restricted with a RSL, but the permitted limits in the MRSL are usually higher than the limits for similar substances in an RSL. The reason for the discrepancy in permissible levels of restricted substances in the MRSL compared to RSL is that MRSL focus on concentration in the process chemicals concentration while RSL in the finished textile products. Due to dilution in the dyeing and finishing processes, the concentration of the substances in the textiles will be much lower and will therefore meet the requirements in a standard RSL. In some cases, such as for volatile solvents, substances may not be present in the final product and hence, do not need to be listed on a RSL but can still be restricted in an MRSL. According to AFIRM (The Apparel and Footwear International RSL Management Group) the use of a MRSL will not necessarily enhance the transparency in the supply chain, it is just another way of meeting the legal requirements as well as the levels in an RSL. Depending on how it's used, it could however also serve to increase transparency since some supply chain actors may request full ingredient disclosure to ensure RSL and MRSL requirements are met.

4.1.4 Ecolabels

Ecolabels have for many years been used by textile companies who want to prove that their textiles have been produced in a more sustainable way. A range of national and international ecolabels exist in Europe, for example the Nordic Swan which is a Nordic ecolabel established by the Nordic Council of Ministers, the EU Ecolabel which is an European ecolabel established by the European Union and GOTS (Global Organic Textile Standard) established by a private global organization.

Ecolabel schemes are different from RSL's and function more like MRSL's. Where RSL (and a label like Standard 100 by OEKO-TEX®) exclusively focus on substances in the final product, the ecolabels have criteria to the production steps and especially to the chemicals used in production. The chemicals are regulated by classification, biodegradability and their content of unwanted substances like metals. To meet these requirements, the applicant must have a complete list of the chemicals used in production and provide a SDS and a written declaration from the chemical manufacturer.

The difference between RSL methodology and ecolabels is that where RSL has focused on safe products, free from hazardous substances, the ecolabels aim to promote products where the entire production is more environmentally friendly. Besides having requirements to chemicals, ecolabels also have criteria for fibers, wastewater treatment and the quality of the textiles. Ecolabels are labels that are addressed to consumers who want independent proof that the textiles are more environmentally friendly.

4.1.5 The Higg Index

The Higg index is a system developed by The Sustainable Apparel Coalition (SAC) which is a global non-profit organization with more than 250 members including brands, suppliers, consultants, NGO's and other stakeholders²³. The Higg index is a self-assessment standard for assessing environmental and social sustainability throughout the supply chain.

The system contains different modules for evaluating different elements. Some of these modules are:

- Higg Facility Environment Module (FEM)
- Higg Facility Social & Labor Module (FSLM)
- Higg Brand & Retail Module (BRM)
- Higg Materials Sustainability Index (MSI)
- Higg Product Module (PM)

The Product Module (PM) quantifies the environmental impacts of product and material manufacturing and includes chemistry in its assessment. However, the PM module is based on life cycle assessment²⁴ (LCA) which means that chemicals are not the main focus. As a result, the Higg index is not a strong tool if a company wants to control chemicals in production. The recent years the Higg index has become increasingly popular also among middle size companies who use this a tool to describe the environmental performance of their products.

4.2 Types of chemicals considered in ecolabels, RSLs and MRSLs

As mentioned, OEKO-TEX® is a labelling system that was amongst the first who made a systematic approach to also test textiles to make them safe to wear. They focused on chemicals that were known or suspected to be hazardous to human health. Examples of these substances are: azo -dyes, chlorophenols, chlorinated benzenes and toluenes, a range of dyestuffs, formaldehyde, extractable heavy metals, polycyclic aromatic hydrocarbons (PAHs), organotin compounds and solvent residues.

A RSL set limits for hazardous substances in the textiles. A MRSL has requirements for the chemicals used in production, but the aim is to meet the limits in an RSL. Each group contains several substances that might have different limiting values. All RSL and MRSL still contain chemical group like these but also other groups. Most of the substances are related to specific materials where the risk is higher, e.g., polycyclic aromatic hydrocarbons (PAH) can be found in fibers like polyester and polyamide, hexavalent chromium (Cr (VI)) is a risk in leather, azo-dyes are a risk in dyed textiles etc.

Ecolabels have a focus on the individual chemicals in production. Chemicals used in

23. HIGG Index. *About Us Sustainability Insights Platform Higg*

24. HIGG. *An Introduction to Product Module*. <https://howtohigg.org/higg-product-module/an-introduction-to-product-module/#section4>

dyeing, printing and finishing are not allowed by classification. Substances classified with risk phrases covering acute toxicity, respiratory and skin sensitization, carcinogenicity, mutagenicity or toxicity for reproduction and hazardous to the aquatic environment cannot be used in a labeled textile product unless they meet well defined derogations. Many substances must be readily biodegradable to be used and other substances are prohibited in production. Ecolabels have focused on the environmental impact of chemicals in production and make use of classification (according to GHS) to exclude the use of chemicals with unwanted properties. This approach is broader and covers more substances than a RSL or MRSL.



Photo: Markus Spiske / Unsplash

5. OUTCOME FROM INTERVIEWS WITH STAKEHOLDERS

This section provides information and summarizes the results from the interviews performed with stakeholders in the textile industry. For information regarding the identification of stakeholders, please see section 3.

5.1 Participating stakeholders

Information from interviews and from written input has been collected from ten different stakeholders. Those consisted of eight companies that sell textile products (seven clothing companies and one company that sells furniture), as well as one non-governmental organization (NGO) and one industry association. These organizations are listed in Table 1. Interview questions can be found in Annex 1.

Table 1. Interviewed stakeholders.

Company	Company size*	Type of product/business
H&M Group	Large	Clothes (fashion)
GinaTricot	Large	Clothes (fashion)
Peak Performance (2020)	Large	Clothes (sports/outdoor)
KappAhl	Large	Clothes (fashion)
Stadium	Large	Clothes (sports/outdoor)
Bestseller	Large	Clothes (fashion)
Mio	Large	Furniture
Fjällräven	Medium	Clothes (Sports/outdoor)
Chemsec	-	NGO
AFIRM Group	-	Industry association

*European Union, 2003. Commission Recommendation of 6 May 2003 concerning the definition of micro, small, and medium-sized enterprises. EUR-Lex - 32003H0361 - EN - EUR-Lex (europa.eu)

5.2 Summary of interviews

The information gathered from the interviews has been collated and summarized under the headlines below. For many of the topics covered, the answers were remarkably similar from company to company.

5.2.1 Communication in the tiered textile supply chains

The textile industry supply chain is complex, and the different stages of production are normally described in a tier system. In these tiered supply chains, tier 2 companies supply companies in tier 1, while tier 3 companies supply tier 2, and so forth. The tier system is not 100% defined and companies might define the system differently, but a typical system²⁵ looks like depicted in Figure 2.

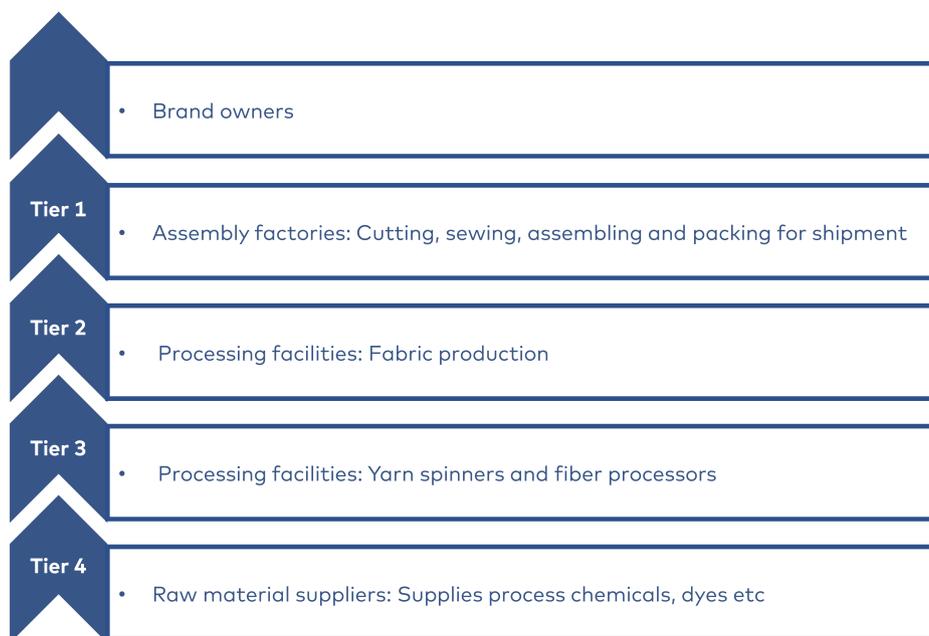


Figure 2. Schematic figure of the tier system in textile production.

Chemical information is transferred through the tiers of suppliers in a top-down system where the brand owners have certain requirements that must be transferred through the tiers by its suppliers. Companies are mainly communicating with Tier 1, and they can be seen as a gatekeeper to information transfer throughout the supply chain. The brand owner or receiver of the final product may in many cases therefore not know which companies that supply to them, at least not beyond Tier 1–2. All companies interviewed in this report perceives that it is difficult to get information from suppliers further down in the supply chain. There is only one company that mention that they communicate with the chemical suppliers, i.e., the lowest tier but

25. Textile Exchange, 2020. Materials Terminology Guide. <https://textileexchange.org/wp-content/uploads/2021/05/Materials-Terminology-Guide.pdf>

most companies are in a process of getting closer to their supply chain and to the suppliers in Tier 2–4.

Depending on who their customers are, suppliers are not used to be transparent about chemical information e.g., on what treatments are used and to transfer this information in the form of documents or safety data sheets. Some companies are experiencing difficulties to get data on the exact composition of chemical products as this information is considered a trade secret, against company policy to disclose or patented by suppliers. Some of the interviewed companies mention that tier 1 suppliers are not always transparent with requirements and other information towards their suppliers which hinders the requirements to reach down to all tiers in the supply chain. The tier 1 suppliers are sometimes also reluctant to disclose the identity of the lower tier companies for the sake of confidentiality or competition.

For the most part however, suppliers are transferring chemical information when asked for it, but they do not always understand the requirements or what kind of information they are supposed to transfer. The core type of chemical information through the supply chain is mainly based on communication of safety data sheets and test reports. The quality of the received information can vary considerably between suppliers and similarly to other information from suppliers, test reports can vary between laboratories. This variation in quality of documents makes results more difficult to compare and to understand if the test is fulfilling the company's requirements. It may also be difficult to know which method laboratories are using, what the detection limits are etc, as there is no standard. All of this contributes to an administrative burden for the company receiving information as much of this has to be verified before it can be trusted.

The described information flow is not always very fast which can provide additional challenges for fashion collections with temporary availability, and it is not always possible to collect all information before the products are no longer available in stores. Here, the interviewed companies believe that improved system support is needed to assist in keeping track of information. One company also mentions that they are using third-party certifications but only for their regular collections since third-party certifications does not bring any benefits for products that do not stay in the regular collection. Due to the fact that it takes a long time to get the right information and the high costs for product tests. Companies that work with fast fashion state that they do more tests on their regular collection rather than for products that are only available in a certain season. Chemical testing is however costly, and the number of available laboratories limited which makes increased testing something that companies want to avoid. Additionally, testing is an "end of pipe solution" and more proactive work will have better impact than increased testing.

Even though some companies are working with chemical inventories at their supplier's factories, it is difficult to know how much was used in the production of exactly each batch. Additionally, a complicating factor is that input does not always equal output in terms of chemical content. Chemical reactions and washing steps are two of these factors that complicates the assessment of what is in the produced article.

5.2.2 Ways to improve flow of information on chemicals

All companies believe that the flow of information on chemicals needs to be improved to be able to better understand the chemical content of their products and to be more transparent. This is also highlighted as especially important to enable the use of more recycled materials in the future.

Reliable information on hazardous substances is very important for the companies and they work with hazard assessments to try to identify phase-out substances. Some of the interviewed companies find it difficult to get appropriate information from chemical suppliers when looking for alternatives to phase-out substances. Companies want to work more proactively to be prepared for new legislation and industry practices but would also like to see increased transparency from the suppliers to enable them to choose the best alternatives.

To improve the communication of chemical information and the control in the supply chain, most of the companies have representatives in the countries where their products are produced. This has made it easier for them to do regular tests and to increase the control of which chemicals are used in the factories. Having local employees has also simplified the communication as they can communicate in local languages. Nevertheless, the flow of information on chemicals is affected by the location of the production as the complexity in the supply chain differ between production countries. In Bangladesh, the factories are more vertical, meaning that they are responsible for everything from the fibre to sewing the products which simplifies the transfer of information. The production in e.g., China and Turkey are according to the interviewed companies more complex as different factories are responsible for different steps in the production.

The industry organization AFIRM Group thinks that transparency has increased in the textile industry during recent years. Most brands have open lists of suppliers, and some suppliers even share information about sub-suppliers in Tier 2 or 3. They are also more open regarding how they work with chemicals and what they do to substitute unwanted substances. The members of AFIRM Group share experiences regarding chemical issues and the industry organization promotes its own RSL list in order to make it the leading standard.

According to the interview companies, to be able to improve the information flow throughout the supply chain, better system solutions are needed. The textile industry has not felt the need to develop advanced systems for chemical content, largely because of a lack of pressure from consumers or from policy or legal requirements. Without that kind of pressure, it will be difficult to argue internally in companies to spend large economic resources. One company does not believe that a system where they know exactly which chemicals are used in finished textiles is needed. They argue that there can be potentially thousands of individual substances in them and that would be very expensive to test. However, in order to transfer information through the whole supply chain, some companies believe that use of new techniques is needed, e.g., Radio-frequency identification (RFID), QR-code or block chain technology.

Companies believe that there is a need for a common tool to score finished products and their impact in terms of chemicals. Although there are systems that partly do this already, it was pointed out by one of the companies that information from e.g., HIGG and PEF (product environmental footprint) is based on life cycle assessment

and do not include enough information on chemicals. That could be or become a greenwashing problem as people think that environmental footprint includes all necessary information. Incorporating chemical factors in commonly used tools for sustainability purposes or supply chain management could therefore be a way to develop the information transfer further.

5.2.3 Communication to customers

Most of the interviewed companies do not think that their customers have an interest in the chemical content in the products or at least not in detail. Questions from customer's rarely focus on chemical content but rather on other sustainability questions e.g., origin and production methods and on animal welfare. A few of the interviewed companies experience that their customers have an interest in knowing the chemical content for specific products or applications, e.g., PFAS in coatings or silver for antibacterial treatments. If companies do get questions from customers regarding chemicals, it is normally concerning those chemicals that are currently being mentioned in the media. Occasionally they get requests about the content of SVHC's (substances of very high concern) which is a consumer right described in REACH. They also experience that some customers do not believe that any chemicals are used to produce textile products.

Considering the above, the companies agree that if they were to be completely transparent about the chemical content of the products, it would be very difficult for their customers to understand and most likely make many customers more worried. The final customer is therefore not the target audience for increased information about chemicals in products. Customers should be able to trust the brands that the products are safe. Ecolabels and third-party verification are two ways for the companies to communicate chemical information with their customers and this can also give be perceived as more reliable.

One company mention that business to business (B2B) customers are more desirous to know about the chemical content in products and that is an important incentive to improve their RSL. One reason for that is that B2B customers need to adapt to global requirements.

There seems to be an agreement that increased information could also be useful in the end of the product life cycle for recycler of textiles that need to ensure that they do not recirculate banned or harmful substances.

5.2.4 The use of existing chemical management systems

All companies follow the same general method in their work to ensure safe products, they mainly communicate with their suppliers regarding chemical requirements through their RSL or MRSL. As creating a RSL requires strong chemical knowledge, almost all companies use RSL's that are developed by external partners. Many of the interviewed companies are members of the network "Kemikaliegruppen" facilitated by RISE²⁶ and use their RSL. Other companies use the RSL that is made publicly available by AFIRM, and a few companies make their own RSL with help from

26. RISE – Research Institutes of Sweden. <https://www.ri.se/en/about-rise/our-purpose> <https://www.ri.se/sv/om-rise/vart-uppdrag>

consultants. All companies state the RSLs used are updated at least annually and almost all companies have added certain substances to their RSL that is of particular interest to them. The substance groups of particular interest mentioned in the interviews are: PFAS, phthalates, bisphenols, antibacterial substances, silver, flame retardants and biocides. The RSL requirements are followed up by chemical testing of selected products. The testing normally follows a risk-based approach where the most harmful substances are tested more frequently and products from suppliers who recurrently fail testing are tested more often than products from suppliers with less fails.

According to Chemsec, the use of RSLs roughly introduces two kinds of solutions for recipients of such a requirement. Some companies make sure to phase out or not use the listed chemical. Others may still use the chemicals but instead introduce e.g., additional washing steps to ensure that the final products would meet the concentration limits given in the RSLs. This way of working minimizes the need of information as the product fulfil the retailer's requirements. To counter this development, MRSLs were introduced that limits the use of substances in the whole manufacturing chain.

Even though many RSLs and MRSLs are similar, suppliers need to handle different requirements from many of its customers. It could therefore be close to impossible for a supplier to handle all these individuals lists and ensure compliance towards each and all of them. That makes it more complex for smaller companies to have their own requirements as suppliers focus to fulfil the requirements from their largest customers. Small companies which only may want to add a few substances on their RSL that's go beyond the scope of standard RSLs, experience that it is very difficult to add substances to the list without either a larger actor leading the way or that there is a legal requirement behind it. For legal requirements, suppliers are usually very accommodating. To circumvent this, companies have increased their efforts put into communicating with suppliers and tried novel ways to communicate. Long term relationships with suppliers are beneficial and when that is realised, makes it easier for them to communicate about chemicals. However, there is still a problem as some suppliers do not receive companies' requirements due to the complexity in the supply chain.

Several of the interviewed companies mentioned that some suppliers still could not understand why the legal requirements are not enough and other suppliers complained that there were too many different RLS's. Chemsec argued that chemical management would look different if there was a common RSL and MRSL for the whole industry as it can be difficult for individual companies to add substances to the requirements that other companies do not have. This information indicates that initiatives such as the AFIRM RSL may still not be known to everyone despite the ambition to make their RSL the leading one that all can use for free. If this ambition were to be met, this could simplify the further development of chemical requirements, improve information transfer and allow also smaller actors to have up-to-date requirements.

Some suppliers have chosen to only cater to one market, e.g., some suppliers are only manufacturing products that is for the EU-market. That makes it easier for supplier to handle all customer requirements and to stay updated on changes of the legal requirements. However, one company that sells to more markets than the EU mentions that they are using the same manufacturers for all their products even

though they are going to be sold on different markets. They have the same strict requirements for all their products even though they are used on different markets.

One company highlights that the use of labelling systems such as OEKO-TEX® and Bluesign®²⁷ can hamper the improvement of chemical management as they have a good reputation, but they do not have as strict requirements that some brands want to have. An example of such a conflict of interests could be a case when a substance that is listed with a threshold in OEKO-TEX® is fulfilled by the supplier but that the company wants to phase out entirely. The perception is that some third-party certifications have made it difficult for brands to introduce stricter requirements to their suppliers as their requirements accept certain chemicals in products. However, other companies believe it is good for customer value to use third-party certifications and that their suppliers must pass a certain process to be certified.

Different systems exist for companies that want to improve the chemical control through the supply chain. One company mentions that they continuously trying to get closer to their supply chain to reduce the risk of e.g., wrong materials or chemicals. They started from the top with their main products and suppliers which mean that for small orders, they still do not always know e.g., where the fabric is dyed. The company is using an app called BHive²⁸ which is a simple method to create a chemical inventory in their factories and to make sure that the chemicals meet certain requirements. The app has a database of thousands of chemicals and by scanning a label or product name, it is possible to see if the chemical can be accepted by e.g., OEKO-TEX® or GOTS.

One of the companies mention that they have a system of preferred trim suppliers (zipper, buttons etc.) for which the company has close control of the products. By sourcing from this list provided by the brand owner, the suppliers do not have to test acquired components.

Another company mentions that they are using a third-party system, BVE³ from Bureau Veritas²⁹, in which the company map the chemical inventory at all their suppliers each month. The system checks all safety data sheets against the requirements in their restricted substance list.

Some companies are working with HIGG³⁰ and their environmental chemical module FEM (facility environmental module) in which suppliers list all the chemicals used in their production. This would enable information on all chemicals that are used in the production, but it is not traced down to product level. The system is only used to get a broader overview of the chemical use in the factories. The suppliers that are a part of the interviewed companies' projects with HIGG and a chemicals management system believes it is a lot of information that needs to be transferred that they are not used to handle. HIGG aims to score products based on their environmental footprint, for example what kind of cotton that is used in a product. The system is however focusing on chemical inventories in the factories and does therefore not keep track of what chemicals are used for a certain product which can be problematic when companies are trying to substitute chemicals.

27. bluesign® - solutions and services for a sustainable textile industry

28. <https://www.thebhive.net/>

29. <https://e3.bvonesource.com/cd/cpdHome>

30. <https://apparelcoalition.org/the-higg-index/>

5.2.5 The use of recycled materials

All companies highlight the increased interest in using recycled materials and to reduce their footprint by using more sustainable materials. To be able to use recycled material, companies need to ensure that the recycled material is fulfilling their requirements. Companies mention that there is a problem with certain recycled materials as they do contain substances that are regulated on their RSL or the content of chemicals in the material is unknown. It is common that suppliers of recycled materials do not want to assume responsibility for the chemical content of the materials as it is more complex to ensure than for newly produced materials. Therefore, companies often need to perform their own testing to ensure that the material is fulfilling their requirements. Some materials, e.g., vintage material, is not regulated by the same legal requirements as other textiles, but companies are doing tests against their RSL to ensure the chemical content. Companies highlights that other kind of substances can be found in recycled materials compared to in new textiles and that some materials have been found to be more problematic than others, e.g., recycled wool has been more problematic in terms of restricted substances compared to cotton and polyester³¹.

The availability of recycled materials is generally low, and many companies are using polyester from recycled PET instead of recycled textiles as that is what is available. There could also be cases where it is difficult to establish that the material is actually recycled and for this reason, at least one company mention that they are using third-party certifications to ensure that the material has been recycled. The long delivery times and high price due to low availability makes use of recycled textiles difficult. Additionally, the demand for recycled material from their customers is still low.

It was stated from one company that in order to increase the use of recycled materials, the industry needs to change mindset and focus on what the products contain and to use the best possible chemicals from a hazard perspective. The focus must be on what is actually used in the products. As companies highlight the need of more information of the chemical content in products, they should see a value in gathering more information about their products. The value of the information comes in the form of increased willingness from designers to use recycled materials and thus that recyclers get will get higher demand on recycled materials.

5.2.6 The companies view on indicators

When being asked about their view on possible indicators for tracking the development of increased chemical information flows in the supply chain, all interviewed companies struggle to come up with an answer. Although there are some variations in how far the companies have reached when it comes to knowing and communicating with their supply chain, this is still something that all interviewed companies are working on. This work focuses on ensuring that the suppliers receive, understand and comply with the requirements in the respective RSLs. To a large degree, the supplying companies in the lower tiers are still unknown or at least not in direct contact with brand owners. There is also a common

31. H&M and IKEA, 2021. Collaborative study on chemicals in recycled textiles. Presentation of results retrieved from <https://www.naturvardsverket.se/contentassets/be04327b5a874955a5402d4f663d1632/webinar-collaborative-study-chemicals-recycled-textiles-hm-ikea.pdf>

perception amongst the companies that when trying to improve information on actual substances used such as exact composition of chemical products used, this is often difficult or even impossible as the supplier refer to trade secrets, company policies or patents.

Despite the difficulties outlined above, there is a movement in the industry towards increased transparency when it comes to the chemicals used. Companies believe that transparency could be a good way to measure, at least in the future and one company also believes that systems that are already used could be further developed for this purpose. For example, ZDHC Gateway- Chemical Module³² which finds and list chemicals that conform to the ZDHC MRSL, works as a search engine for safer chemistry, facilitates the exchange of information through the supply chain and increases transparency. ChemScore³³ by ChemSec is another example where leading global chemical suppliers are ranked according to their chemicals management strategies, to enable buyers of chemicals to make informed decisions. The use of HIGG and their modules FEM and PM might be possible to use to measure how much of the company's production that can be accounted for in terms of transparency of content.

It was pointed out by some companies that outside the chemicals area, transparency is already measured or an existing requirement e.g., for social inspections, cosmetics and food. In the interview with Mio, a company that sells furniture, it was highlighted that traceability is required for the wood used in their products according to the EU timber Regulation.³⁴ The procedure related to this EU regulation and its associated information flow normally works well despite having a similar complexity to chemical information. It may therefore be possible to measure transparency but it likely requires a commonly agreed framework to ensure more sameness and providing incentive for collecting the information. There seems to exist a consensus that since all companies have developed their own information needs, method and verification procedure, it will be difficult to compare the current information flow.

5.2.7 Legal requirements

A subject that came up in all interviews with the companies was that of harmonised legal requirements and their importance for the company's work with ensuring safe products. The current legal requirements are seen by the interviewed companies as one argument for today's situation where companies mostly have control of what chemicals that are not used in their products. As it is right now, companies need to prove and ensure that their products do not contain certain substances but they are not required to be transparent about what the products contain.

A majority of the interviewed companies believe that legal requirements are the way forward in improving information flow. As all companies have different resources and are working with different approached to chemicals management, legal

32. ZDHC. The ZDHC Gateway- Chemical Module. Roadmap To Zero - Input

33. <https://chemscore.chemsec.org/>

34. Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02010R0995-20200101>

requirements are needed to improve the information flow. Large companies with more resources have dedicated employees working with these questions, but it is perceived as more difficult for small companies that can have one employee that is e.g., responsible for sustainability where chemicals are included. Smaller companies believe that the complexity in the supply chain would decrease with more legal requirements and that it would simplify their task to collect chemical information from supplier that otherwise may be reluctant to disclose information.

Legal requirements would also minimize the difference in how companies work since it would force all companies to work with their management of chemical information and not only those that want to be in the forefront. This necessitates a harmonised approach to legal requirements and the interviewed companies are positive towards EU-wide or even global harmonisation when possible. Most of the interviewed companies are however of the opinion that legal requirements are slow and that it will take time to be able to make a change in the industry solely based on legal requirements.

6. GAP ANALYSIS

From the study performed and from the information obtained from the interviewed companies, it is possible to identify a number of gaps regarding the chemical information flow and chemical management in the textile supply chain that has a potential impact for the development of global indicators for the expected global target on improved transfer of chemical information. These gaps are described below.

- No existing indicators have been identified that are or can be used directly by a large part of the global textile industry to follow up progress towards the expected target. Although the common aim for the interviewed companies is to be able to provide their customers with products that they can trust to be safe, both the methods and efforts put into achieving this aim differs between companies. Although there are initiatives such as the AFIRM RSL that aim to coordinate and streamline company requirements and publish this information for anyone to use, it is unclear to what extent this information is used. There appears to be a general lack of incentive amongst companies to go beyond existing regulatory requirements to provide information. This could partly be explained by an absence of pressure from policy and clients but also from the difficulties described by the companies to demand information from suppliers that is not firmly established in legal requirements.
- There are a multitude of systems, tools and approaches to collect information on chemicals. This diversity makes it more difficult to find a common baseline as the collected information differs between systems and companies. In essence, there is a lack of coordination and coherence of chemical information management in the textile industry.
- Similarly, the information need also varies between actors. Some companies have their own policies in which they aim to ban certain substances or groups of substances, e.g., PFAS despite not all these substances are regulated. This ambition can clash with suppliers that either do not have the information, want to share the information or that are offering materials that comply with a certain Ecolabel in which the use below a certain threshold is acceptable.
- Despite not having been explicitly mentioned by the companies in this study, the lack of implementation of GHS that aim to provide a common language in the form of classification and labelling of chemicals in some areas of the world has the potential to further increase the difficulties with transferring information. When updating requirements and phasing out hazardous substances, the classification is an essential piece of information that many decisions are based on. If this elementary information does not exist or is difficult to interpret, this hampers the information flow and introduces uncertainty. This could also partly explain why all of the interviewed companies mention the large efforts they have to put into verifying information.

- There is a varying willingness to share information amongst different supply chains, also from a geographical perspective. Some of the interviewed companies mention that it is easier to obtain the sought information in countries such as Bangladesh as compared to e.g., China where transparency of information is not something that is highly valued.
- Lack of knowledge and resources seems to be an obstacle for many of the interviewed brand owners. Lack of knowledge is sometimes claimed when it comes to dealing with information on chemical substances, interpreting chemical information and test reports. Furthermore, there seems to exist an uncertainty regarding the added value of additional information. Even if more information was available, it seems as if many companies are badly equipped to deal with such information, lacking both expert staff members and tools to assist in handling more information. When it comes to resources, this seems like a problem possible to overcome by focus and investments. Many companies that are considered small in the textile industry are not small companies per se and should have the means to invest in this area. It rather seems like this comes back to the lack of incentive and that it is difficult for companies to internally argue for increased expenses in an area where it in the short term may be difficult to see a return of investment.
- The supply chain flow of information on chemicals is generally non-public and company specific which would need companies involved both in the development of indicators and in the follow up.

7. CONCLUSIONS AND RECOMMENDATIONS FOR INDICATORS

As already mentioned in the gap analysis, there are most likely no ready-made indicators that are used in the textile supply chain. From the interviews, it is clear that even some of the most advanced companies in the industry when it comes to chemical information are struggling to improve their knowledge about chemicals used in their own products. It is also clear that policy initiatives such as the new circular economy action plan³⁵, chemical strategy for sustainability³⁶, climate target plan³⁷ and strategy for sustainable and circular textiles³⁸ will force EU-based companies to reduce the use of harmful substances and increase the use of recycled material. This will in turn affect the suppliers, many of whom are based outside the EU, to provide more information about chemical content. This is however a change that has only begun and is likely to still require a number of years before its effects can be seen. Additionally, although not specific to the textile industry or chemicals used therein, the use of GHS provides a sound harmonized basis for global discussions on hazardous chemicals as it provides the common language that everyone can understand. Further global implementation of GHS is therefore likely to be an important factor for improved information flow of information on chemicals.

Below are suggestions for indicators that could be developed to track the development towards increased information on chemicals in the textile supply chain.

Indicator 1 – Tracking the use of information provided by common RSLs

There are many intrinsic chemical properties that are classified as hazardous that may or may not be considered an issue when it comes to use in textile value chains. Consequently, to use an indicator to monitor the development towards increasing information in the textile supply chains, there may be a need to first define which chemicals or more specifically, for which kind of hazardous properties the information should be available. It may also be reasonable to focus on the known problematic substances first, i.e., those that are already regulated or known to cause negative health and/or environmental effects.

Companies in the textile industries mostly make use of either their own or inter-company agreed restricted substance lists (RSL) or manufacturing restricted

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35. European Commission, 2020. A new Circular Economy Action Plan For a cleaner and more competitive Europe. COM(2020) 98 final. https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF
 36. European Commission, 2020. Chemicals Strategy for Sustainability Towards a Toxic-Free Environment. COM(2020) 667 final. <https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf>
 37. European Commission, 2020. Stepping up Europe's 2030 climate ambition- Investing in a climate-neutral future for the benefit of our people. COM(2020) 562 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0562>
 38. European Commission, 2022. EU Strategy for Sustainable and Circular Textiles. COM(2022) 141 final. https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

substances lists (MRSL) as described earlier. The use of any RSL is therefore not a suitable indicator since the RSLs vary in content and ambition between companies. By agreeing on a lowest common denominator in terms of what a RSL should contain, the use of those RSLs or MRSLs that fulfil the criteria could be used to indicate a progress in terms of chemical information. A good starting point could e.g., be the AFIRM RSL that is mentioned by several of the interviewed companies in this report, but there may also be others with a comparable scope that could be used for this purpose. By advocating and measuring the use of these RSLs with a known and agreed minimum level content, an increase of use can be assumed to indicate an increase in the flow of information on chemicals and that more products conform with stricter requirements regarding its chemical content. The indicator would then consist of how many companies that make use of (meaning implementing the requirements in their supply chain) these common RSLs combined with those companies' production volume. By calculating this, it would show how much of the global textile production that is covered by the set of determined chemical information requirements that are in the RSLs/MRSLs.

A main difficulty with a system like this will be to collect information on which companies that make use of the commonly agreed RSLs. A first approximation and measure of this could be the members companies of the organizations that provide the agreed minimum requirement RSLs. This would however exclude those that are not members but still use these RSLs since they, at least in some cases, are publicly available. A second difficulty is the sheer size and number of actors in the textile industry which makes both large scale surveys and calculations unfeasible. A way to collect this information could therefore be to ask a representative sample of textile companies in surveys, both in terms of size and geographical location and to extrapolate the results. Another possibility is to identify and target information from companies that have the largest market share/production volume/gross revenue, e.g. the 100 top textile producers globally. The share of these companies that make use of a RSL on the acceptable list could then be used to indicate the progress of information flow. Both these methods are dependent on the response rate to the survey.

In Europe, the recommendations for technical screening criteria³⁹ within the EU Taxonomy for the remaining⁴⁰ environmental objectives include e.g., textile finishing and wearing apparel, the latter including manufacturing, sales and repair, refurbishment and remanufacturing of wearing apparel. Both of these activities include criteria for restricting hazardous chemicals that in order to be fulfilled require companies to assess availability of and adopt techniques that support information on and traceability of chemical content and material composition throughout the lifecycle of the finished textiles. Furthermore, manufacturers need to fulfil requirements for both finishing and final products, the latter specifying e.g. the AFIRM RSL as part of complying. These requirements are likely to contribute to the increase of chemical information flow and should be considered when developing indicators to ensure alignment. It may also be possible to make use of the reporting requirement in the Taxonomy regulation as a source of data.

39. Platform on Sustainable Finance, 2022. Annex to the Platform on Sustainable Finance's report with recommendations on technical screening criteria for the four remaining environmental objectives of the EU taxonomy. See chapter 2.6 and 2.7. https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/220330-sustainable-finance-platform-finance-report-remaining-environmental-objectives-taxonomy-annex_en.pdf

40. The sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control and the protection and restoration of biodiversity and ecosystems

Indicator 2 – Measuring transparency

Measuring increased transparency could be an indicator of improved information. Many of the interviewed companies did mention that increased transparency is on their agenda and ChemSec suggested it as a possible indicator. It also came up when discussing use of recycled content since knowledge of which chemicals that have been used in the production may be an important factor to ensure the continued use of a material. Disregarding all the difficulties with the current transfer of information that has been discussed in this report, using transparency as a measure could be a way forward. For this purpose, measuring the amount/share/percentage of a company's production for which there is transparency or traceability when it comes to chemical content would offer several advantages. A transparency measure would not be relying on assessments of which hazardous substances to report, would not require detailed lists of used (or restricted) substances to be shared outside the individual companies and it would not matter which techniques that are used to collect the information. Complementing the RSL systems used in the textile industry today, this indicator would not rely on information on absence of substances but actual information on presence of used chemicals. This information would also, in contrast to "negative information", have the potential to provide textile recyclers with all the information they need to decide how to handle a certain garment or article. Knowledge of actual content in articles also provides opportunities for a proactive chemical management that is otherwise not possible.

If setting up a system like this today, the share of textiles for which full transparency when it comes to chemical content would be available is likely very small. There are however examples of when transparent information flows exist or are near transparent. As an example, for the Nordic Swan ecolabel, all chemicals used in the production of textiles must be documented, listed and supported by a safety data sheet⁴¹. Although this information does not always reach the brand owner but rather is delivered to the ecolabel for approval, it shows that it is possible.

An indicator like this combined with increasing requests from textile recyclers and policy demands could provide strong incentives for companies to improve and increase efforts to collect chemical information. By collaboration and building on existing systems that handle chemical information, the possibly large amounts of data and other potential issues should be attainable to resolve. It is likely that further legal requirements and policy initiatives will push the development in this direction and that this could make a transparency indicator something that will be a future-proof indicator of improved flow of information on chemicals.

41. Nordic Ecolabelling for Textiles, hides/skins, and leather. Requirements Version 5.0. See requirement O32. <https://www.nordic-ecolabel.org/product-groups/group/DownloadDocument/?documentId=6318>

APPENDIX 1

INTERVIEW QUESTIONS

What kind of chemical information is available for your products?

In which format is this information transferred?

Are you content with the information as it is currently or what is needed to improve?

To what extent do you know which chemicals are used in the production of your products?

Is there any interest in knowing exactly what your products contain or is enough to know what they do not contain?

Do you have requirements to the chemicals that are used in the supply chain other than they must meet you RSL requirements?

Does the information that you do have flow through the whole supply chain or are there specific actors that are not reached or that are more difficult to reach?

Do you only need information about hazardous chemicals, or should all chemicals be reported? If yes, how do you distinguish between hazardous and not, i.e. where do you draw the line in terms of classification?

What do you need to know to be able to use recycled material (in terms of chemical content)?

Do you think all companies have similar needs or does this vary?

What do you think would be a good indicator of the status of the information transfer?

Do you think it is valuable to measure transparency through the supply chain as an indicator? i.e. how complete information you get from each supplier.

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